

Blackmagicdesign 

ADVANCED EDITING WITH

DAVINCI RESOLVE 15



Learn how to create Hollywood caliber digital films and video with the world's most advanced editing, visual effects, color correction and audio post production solution!

by Chris Roberts and Rory Cantwell

Download
**DAVINCI
RESOLVE**
Free!

ADVANCED EDITING WITH

DAVINCI RESOLVE 15

by Chris Roberts and Rory Cantwell

Advanced Editing with DaVinci Resolve 15

Chris Roberts and Rory Cantwell

Copyright © 2019 by Blackmagic Design Pty Ltd

Blackmagic Design

www.blackmagicdesign.com

To report errors, please send a note to training@blackmagicdesign.com.

Contributing authors: Jason Druss, Mary Plummer, Dion Scoppettuolo, Daria Fissoun

Series Editor: Patricia Montesion

Editor: Bob Lindstrom

Cover Design: Blackmagic Design

Interior Design and Compositor: Blackmagic Design

Notice of Rights

All rights reserved. No part of this book may be reproduced or transmitted in any form by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher.

For information on getting permission for reprints and excerpts, contact training@blackmagicdesign.com.

Notice of Liability

Neither the author nor Blackmagic Design shall have any liability to any person or entity for any loss or damage caused or alleged to be caused directly or indirectly by the information contained in this book, or by omissions from this book, or by the computer software and hardware products described within it.

Trademarks

Many of the designations used by manufacturers and sellers to distinguish their products are claimed as trademarks. Where those designations appear in this book, and Blackmagic Design was aware of a trademark claim, the designations appear as requested by the owner of the trademark. All other product names and services identified throughout this book are used in editorial fashion only and for the benefit of such companies with no intention of infringement of the trademark. No such use, or the use of any trade name, is intended to convey endorsement or other affiliation with this book. macOS is a registered trademark of Apple Inc., registered in the U.S. and other countries. Windows is a registered trademarks of Microsoft Inc., registered in the U.S. and other countries.

ISBN: 978-1-7327569-4-6

Contents

Foreword	vi
Getting Started	vii
Acknowledgments	xi
1 Editing Basics	1
Editing a Trailer	2
Creating the First Assemble	9
Finessing the Edit	32
Audio Mixing Basics	40
Adding Transitions	43
Adding Fusion Titles	46
Carry on Cutting	48
Lesson Review	49
2 Managing Dailies and Edit Prep	51
Backing up Source Files	52
Customizing New Projects	57
Syncing Dailies	59
Modifying Clip Audio Channels	64
Configuring Metadata Presets	67
Saving Searches using Smart Bins	74
Creating Power Bins	76
Optimizing Clips for Editing	78
Lesson Review	83
3 Cutting a Dialogue Scene	85
Selecting your Best Takes	86
Editing with Continuity	92
Match Frame with an Offset	96

Going Beyond the Straight Cut	99
Auditioning Multiple Takes	106
Lesson Review	111
4 Making A Radio Edit	113
Examining Audio in a Radio Edit	114
Editing Subframe Audio	124
Creating Variable Speed Changes	126
Using Smooth Cut	130
Working with Advanced Transition Tools	131
Lesson Review	137
5 Editing an Action Scene	139
Starting a Dailies Timeline	140
Using Tabbed and Stacked Timelines	142
Cutting on Action	147
Enhancing the Action	153
Comparing Timeline Versions	166
Lesson Review	169
6 Editing Multicamera	171
Syncing Angles	172
Editing a Multicamera Music Video	178
Complex Multicamera Editing	186
Lesson Review	197
7 Creating Multilayered Composites	199
Roughing out your Vision	200
Working with Graphics	218
Working in a Compound Clip	223
Improving Multi-layered Performance	231
Adjusting Keyframes	233
Lesson Review	239

8	Creating Graphics in Fusion	241
	Navigating the Fusion Page Interface	242
	Understanding the Node Editor	244
	Using Text and Merge Nodes	249
	Creating Rolling Credits	259
	Tracking a Scene	265
	Keying and Compositing	270
	Lesson Review	279
9	Building and Mixing the Soundtrack	281
	Preparing the Project	282
	Setting up the Fairlight Page	283
	Editing in the Fairlight Page	288
	Panning Tracks in Acoustic Space	296
	Normalizing Clip Levels	299
	Working with Clip Equalization	300
	Controlling Dynamic Range	314
	Automating Track Changes	318
	Simplifying Mixing using Buses	323
	Creating Additional Output Buses	332
	Assigning the Music and Effects Tracks	336
	Monitoring Loudness in your Mix	337
	Lesson Review	341
10	Delivering Projects	343
	Working with Subtitles	344
	Delivering Programs with Subtitles	354
	Configuring a Timeline for Digital Cinema	356
	Rendering a DCP	359
	Rendering and Editing Jobs from Multiple Projects	364
	Lesson Review	367
	Index	369
	About the Authors	372

Foreword

Welcome to **Advanced Editing with DaVinci Resolve 15**

I think one of the most exciting things about DaVinci Resolve 15 is that it brings together editing, color correction, audio post, and now, visual effects in the same software application! With the addition of the new Fusion page in DaVinci Resolve 15, you get over 250 tools for advanced node-based visual effects compositing and motion graphics, along with even better color correction and editing features, and a full-blown Fairlight digital audio workstation. That means you'll be able to switch between creative tasks without having to export or translate files between different applications!

Best of all, DaVinci Resolve 15 is absolutely free! We've made sure that the free version of DaVinci Resolve actually has more features than any other paid editing system. That's because at Blackmagic Design we believe everybody should have the tools to create professional,

Hollywood caliber content without having to spend thousands of dollars.

I hope you'll enjoy using DaVinci Resolve 15 and we can't wait to see the amazing work you produce!

Grant Petty
Blackmagic Design

Getting Started

Welcome to **Advanced Editing with DaVinci Resolve 15**, an official Blackmagic Design certified training book that teaches professionals and students how to get the most out of editing with DaVinci Resolve 15. All you need is a Mac or Windows computer, the free download version of DaVinci Resolve 15, and a passion to learn about editing.

This guide blends practical, hands-on exercises with the aesthetics of editing to help you discover new techniques for whatever editing tasks you take on. You will learn new editing functions, trimming styles, and multilayered timeline capabilities. You'll also go deeply into audio editing and mixing in the Fairlight page to explore techniques used by professional audio engineers to enhance the sound design in your projects.

After completing this book, you are encouraged to take the 50-question online proficiency exam to receive a Certificate of Completion from Blackmagic Design. The link to the exam is located at the end of this book.



About DaVinci Resolve 15

DaVinci Resolve is the world's fastest growing and most advanced editing software. It also has a long history of being the world's most trusted application for color correction. With DaVinci Resolve 15, Blackmagic Design has added a complete set of professional audio editing and mixing tools that enable you to complete projects using only one piece of software!

What you will Learn

In these lessons you'll work with multiple projects to learn advanced, practical techniques used in several editing genres. You'll acquire real-world skills that you can apply to real-world productions.

Lesson 1

Covers some general editing techniques to help you get started.

Lessons 2

Reveals some of the most powerful features in Resolve's Media Page to help you more efficiently set up and organize projects.

Lesson 3, 4 and 5

Use different film and television genres (a dramatic dialogue scene, a documentary interview, and an action sequence) to teach you advanced editing techniques and trimming styles..

Lessons 6

Explores all the tools and techniques for multicamera editing.

Lesson 7 and 8

Focus on motion graphics and visual effects that, as an editor, you will commonly be asked to create. By using a variety of compositing, keying and tracking tools in both the Edit Page and the Fusion Page, you will produce professional-quality opening graphics and realistic composites.

Lesson 9

Takes you through a sound editing, design, and mixing workflow in the Fairlight page.

Lesson 10

Shows how to add subtitles and output a project for cinema with different sound mixes based on the audio work you did in Lesson 9.

System Requirements

This book teaches Resolve 15 for macOS and Windows. If you have an older version of DaVinci Resolve, you must upgrade to the current version to follow along with the lessons. Fortunately, DaVinci Resolve 15 is a free upgrade from previous versions of DaVinci Resolve.

Downloading DaVinci Resolve 15

You can download the free version of DaVinci Resolve 15 from the Blackmagic Design website:

- 1 Open a web browser on your macOS, Windows, or Linux computer.
- 2 In the address field of your web browser, enter **www.blackmagicdesign.com/products/davinciresolve**.
- 3 On the DaVinci Resolve landing page, click the Download button when it appears.

- 4 Follow the installation instructions to complete the installation.

When you have completed the software installation, follow the instructions in the following section, “Copying the two-part lesson files,” to download the content for this book.

Acquiring the Lesson Files

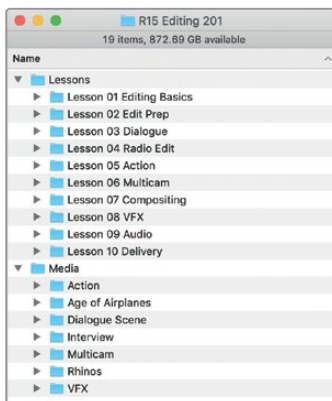
You must download two zipped editing lesson files to acquire the media files you’ll use while performing the exercises in this book. After you download and save the compressed files to your hard disk, extract both zipped files and copy them to a single R15 Editing 201 > Lessons folder that you create in your Documents folder.

To Download and Install the Two Lesson Files

When you are ready to download the two lesson files, follow these steps:

- 1 Connect to the Internet and navigate to:
www.blackmagicdesign.com/dvres/editing-with-resolve15-pt1.
The download will begin immediately.

The **R15 editing lessons pt1.zip** file is 4 GB in size, and depending on your Internet connection, should take roughly 15 minutes to download to your computer using a standard broadband connection.
- 2 Download the second half of the lesson files by navigating to
www.blackmagicdesign.com/dvres/editing-with-resolve15-pt2.
The “R15 editing lessons pt2.zip” file is 5.1 GB in size and should take roughly 25 minutes to download to your computer using a standard broadband connection.
- 3 After downloading the zip files to your computer, open your Downloads folder, and double-click both zip files to unzip them (if your computer doesn’t unzip the file automatically).
- 4 In the Documents folder, create a new folder called **R15 201 Editing**.
- 5 From your Downloads folder, move the folders “Action”, “Multicam”, “Rhinos” and VFX to the Documents > R15 Editing 201 > Media folder.



You are now ready to begin Lesson 1, “Editing Basics”.

Relinking Media Files

Most of the lessons in this book require you to import and open DaVinci Resolve 15 Project files (.drp files). After a project file is imported into the Project manager, you will need to relink offline clips to their media files.

The easiest way to do so is to follow these steps:

- 1 Select the Master bin, right-click and choose “Relink Clips for Selected Bin”.
- 2 In the Select Source folder dialog, navigate to Documents > R15 Editing 201 > Media, and click OK.

The media files should be relinked and you may continue to follow the steps in the lesson.

The Blackmagic Design Learning Series

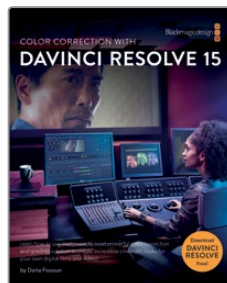
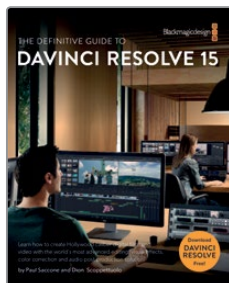
Blackmagic Design publishes several official certification books as part of the Blackmagic Design Learning Series. They include:

- The Definitive Guide to DaVinci Resolve 15
- Advanced Editing with DaVinci Resolve 15
- Color Correction with DaVinci Resolve 15
- Fusion Visual Effects with DaVinci Resolve 15
- Introduction to Fairlight Audio Post with DaVinci Resolve 15
- And more to come

Whether you want to learn more advanced editing techniques, color grading, or visual effects, certified training has a learning path for you.

After completing this book, you are encouraged to take a one-hour, 50-question online proficiency exam to receive a certificate of completion from Blackmagic Design. The link to this exam is located at the end of this book.

For more information on additional books in this series and Blackmagic Design certification training, visit www.blackmagicdesign.com/products/davinciresolve/training.



Getting Certified

After completing this book, you are encouraged to take the one-hour, 50-question online proficiency exam to receive a Certificate of Completion from Blackmagic Design. The link to this exam is located at the end of this book.

You'll be listed on the Blackmagic Design website and receive a Certified logo that you can proudly display on your professional website, social network page, or in your demo reel.

Acknowledgments

We would like to thank the following individuals for their contributions of media used throughout the book:

- Miss Rachel's Pantry in Philadelphia, PA.
- Miserable Girl - Jitterbug Riot - EditStock ad
- HaZ Dulull for SYNC footage. - Sync is a short proof of concept film written / produced and directed by Hasraf 'HaZ' Dulull and is property of hazfilm.com.

Hasraf 'HaZ' Dulull started his career as a Visual Effects Supervisor / Producer before establishing a reputation from his sci-fi short films - Project Kronos, I.R.I.S and Sync for depicting grounded sci-fi themes. This lead him to producing, writing and directing his first Feature film - The Beyond - Released by Gravitas Ventures and currently available on all streaming platforms, and soon after he Directed (based on a story he wrote) - Origin Unknown starring Katee Sackhoff to be released by Kew Media later in 2018. He is currently in development and production on a slate of TV and Feature Films.

HaZ is represented in Hollywood by APA & Ground Control Entertainment. HaZ can be found on twitter @hazvfx.

Lesson 1

Editing Basics

Welcome to Advanced Editing with DaVinci Resolve 15, the certified BlackMagic Design curriculum for professional editors.

Editing is so central to cinematic storytelling that director Francis Ford Coppola once said, “The essence of cinema is editing.” This book explores the deep and powerful editing features found in DaVinci Resolve 15 as applied to the art and craft of editing different genres of video. Whether you are working to produce the latest cinematic blockbuster, a fast-turnaround episodic TV show, or an online promo, while the principals of editing have not changed in over 100 years the technology you’ll find in DaVinci Resolve can (and will) significantly change (and improve) your editorial methods.

To begin with though, let’s take a quick trip through some editing fundamentals which cover the basic skills we will build on throughout the rest of this book.

Time

This lesson takes approximately 60 minutes to complete.

Goals

Editing a Trailer	2
Creating the First Assemble	9
Finessing the Edit	32
Audio Mixing Basics	40
Adding Transitions	43
Adding Fusion Titles	46
Carry on Cutting	48
Lesson Review	49

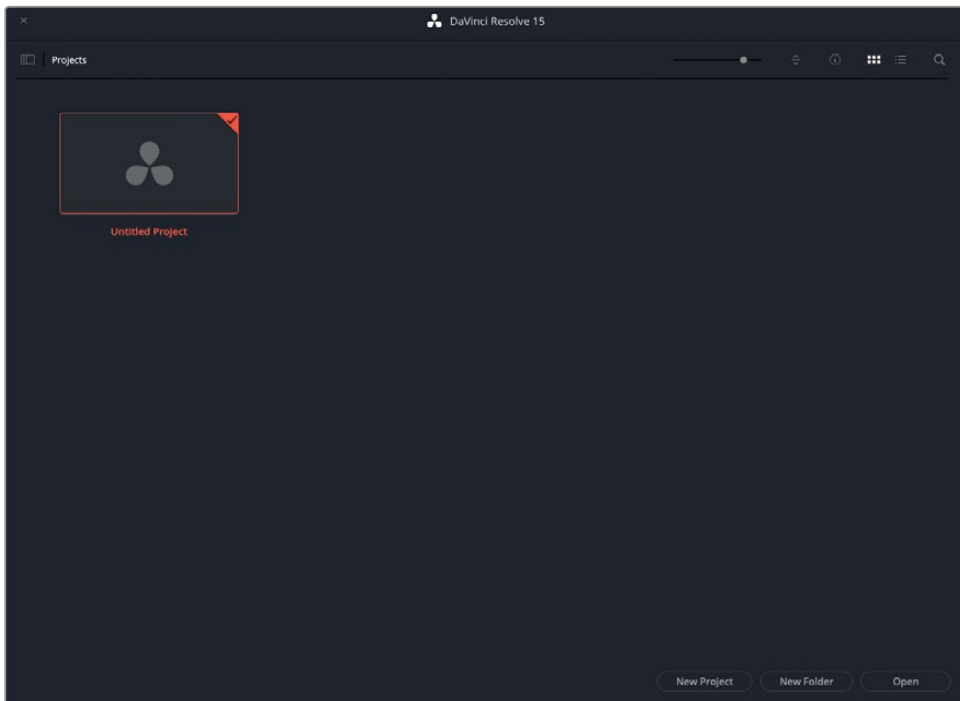
NOTE This chapter assumes you have downloaded the media for this book. If you are unsure, return to the Getting Started section and follow the download instructions in “Getting the lesson files”.

Editing a Trailer

Editing is often an iterative process that requires you to build a coherent story from disparate pieces of footage. Whilst there are many recognized workflows to putting these sounds and pictures together, unfortunately there is no “magic bullet” as every cut has its own unique considerations.

With that said, let’s start building a short trailer for an upcoming movie entitled “Age of Airplanes” by Brian J. Terwilliger so you can appreciate some of the thought processes and happy accidents that often occur in editing suites around the world.

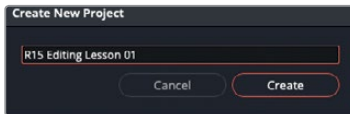
- 1 Open DaVinci Resolve on your system.



The first window you see will be the Project Manager. Naturally enough, this is where you can sort, organize, backup, import and restore the individual DaVinci Resolve projects you work on.

NOTE If you've been using DaVinci Resolve before, you may have a number of projects in the Project Manager already. Feel free to create a new Folder in the Project Manager for the projects you'll be using throughout this book.

- 2 Click the New Project button to create a new project and type R15 Editing Lesson 01.

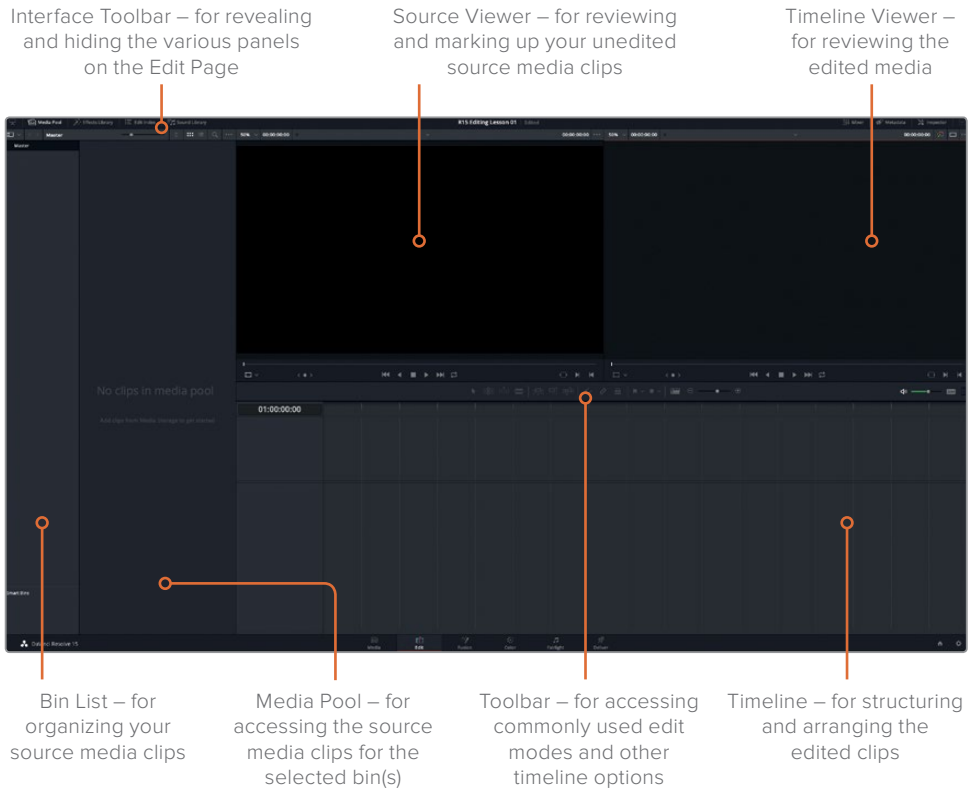


- 3 Click Create.

NOTE DaVinci Resolve does not save individual projects at the OS level like some other non-linear editing systems (NLEs) you may be familiar with. Instead, your projects are stored and managed within one of two types of database. For more information on managing projects and databases, please refer to the DaVinci Resolve User Manual or the The Definitive Guide to DaVinci Resolve 15.

Your new project opens in DaVinci Resolve on the Edit Page.

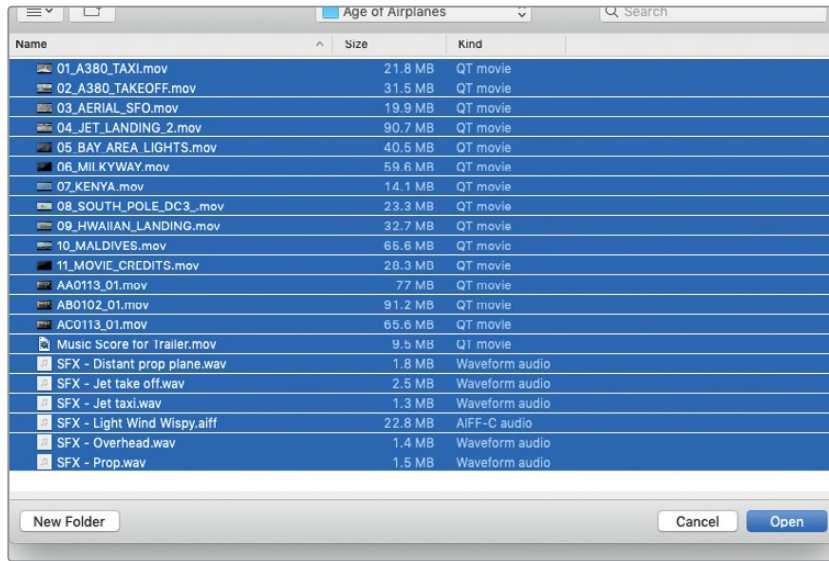
- 4 If necessary select Workspace > Reset UI Layout to reset the Edit Page workspace to the default.



Importing Source Files

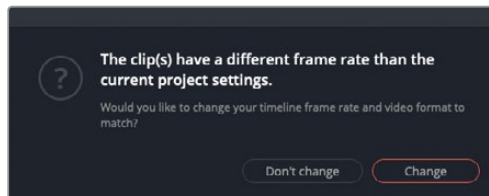
The first step in any editing workflow is to import and organize the source media needed to create the story. In later lessons you will learn the power of the Media Page for this, but for now you'll just be importing directly in the Edit Page.

- 1 In the Edit Page, choose File > Import File > Import Media. Alternatively you can use the keyboard shortcut Command-I (macOS) or Control-I (Windows) or right-click in the Media Pool and choose Import Media.
- 2 In the system file window that appears, navigate to R15 Editing 201 > Media > Age of Airplanes.



- 3 Select all the files in this folder and click Open.

A window appears informing you that the video clips you are importing have a different frame rate than your current project settings and is asking if you would like to change the settings to match these clips.



- 4 Click Change to change the project settings to match these video clips.

NOTE In the next lesson you will learn how to correctly set the timeline settings for your projects and save them as a preset.

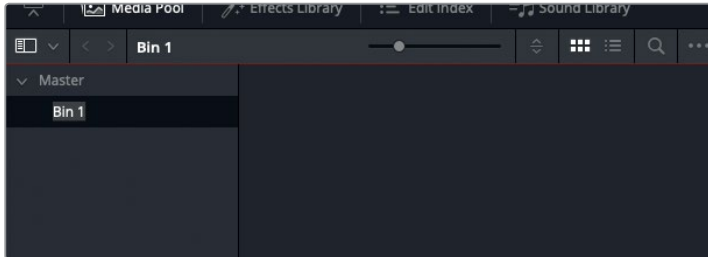
The files appear in the Media Pool and are now ready to be organized prior to editing.

Working with Bins

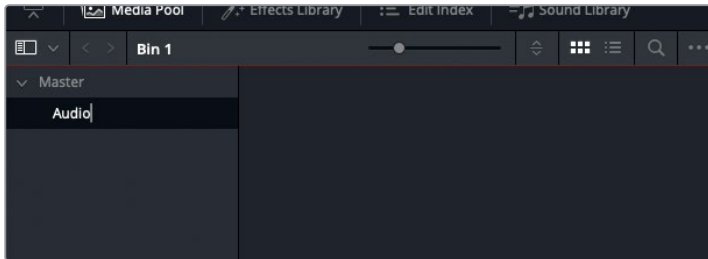
Bins have been traditionally used by editors since the early days of film editing where each piece of film would be hung over a physical *bin*. Although we no longer have physical bins in these more flexible digital times, the terminology is still widely used. For the sake of argument you can use bins in the same way as you would a folder in your computer's file system to organize the media for editing.

By default, every DaVinci Resolve project contains one bin: the Master bin (which cannot be deleted). You are going to create several bins within the Master bin for each type of clip in your project so you can easily find the clip you are looking for.

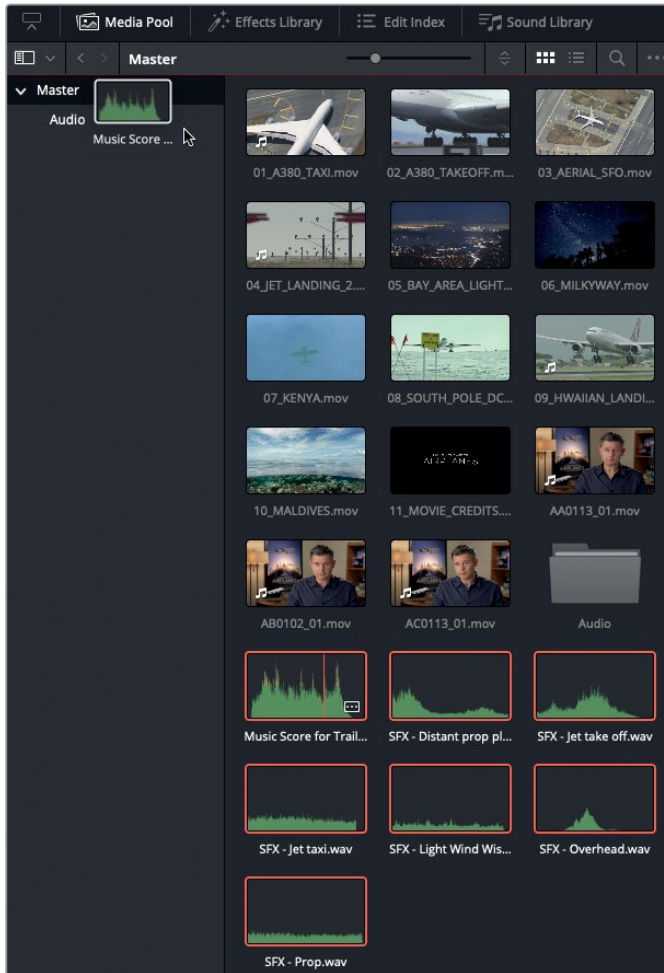
- 1 Choose File > New Bin, or press Shift-Command-N (macOS) or Shift-Control-N (Windows).



- 2 A new bin (Bin 1) appears in the bin list. Rename this bin Audio to reflect what types of clips you will place in this bin.



- 3 In the bin list, select the Master Bin. In the Media Pool select the first of the seven clips with the green waveforms denoting an audio clip, then Shift-click the last of the audio clip to select all the clips in between.
- 4 With the seven clips highlights, click and drag them to the Audio bin in the bin list or the Audio bin icon in the Media Pool.

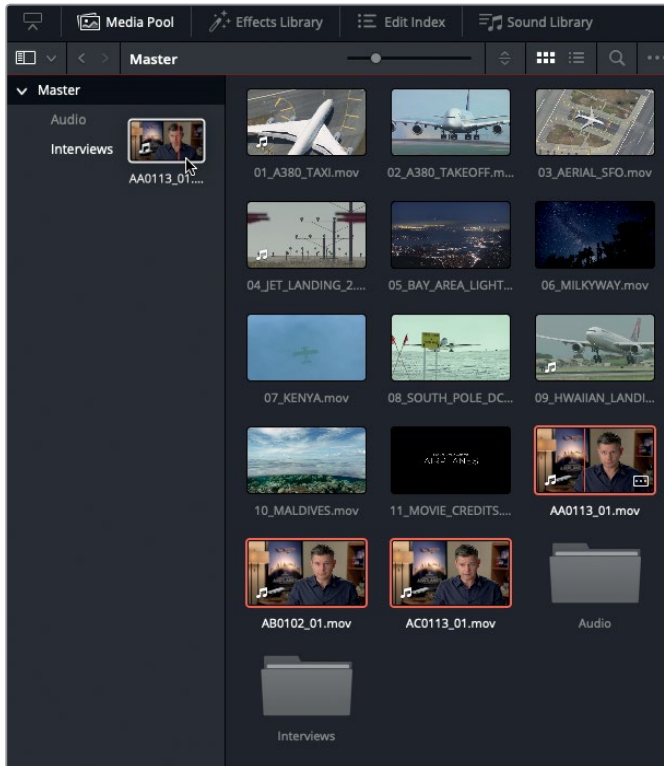


Great. You have now filed all the audio clips into their own neat little bin. To access any of the audio clips from now on you can click on the Audio bin in the bin list or double-click the Audio bin icon in the Media Pool. To return to the top-level of your project, click on the Master bin in the bin list.

- 5 Press Shift-Command-N (macOS) or Shift-Control-N (Windows) to create a new bin. Rename this new bin Interviews then return to the Master bin.

There are three interviews with Brian J. Terwilliger in this project; clips **AA0113_01.mov**, **AB0102_01.mov** and **AC0113_01.mov**.

- 6 Select each of the three interview clips and move them to the Interviews bin.



File Names vs Clip Names:

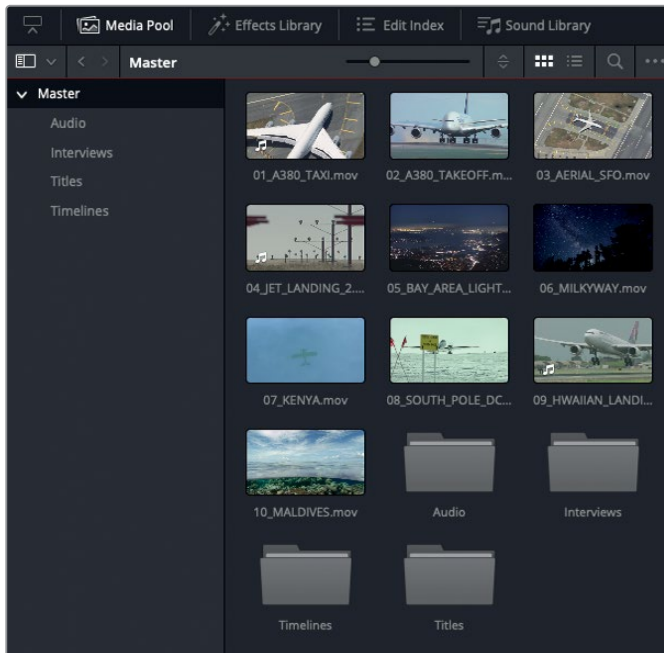
You may be wondering why the three interview clips haven't got helpful names like the rest of the media for this project. The reason for this is that many cameras automatically name their files in such a way that means everything to the camera but not very much to the human aspect of the editing process: the editor. You can choose to rename the clips within your projects if you find this helpful. Just simply click on a clip to select it, then click again directly on the clip name. This will highlight the name and allow you to type your own name for the clip. This in no way alters the original filename for the media on the disk. You will learn more about renaming clips in the next lesson.

- 7 Create another new bin named Titles and move the clip 11_MOVIE_CREDITS.mov to this bin.

Excellent. You've managed to impose some order to your project. However, you've one more bin to add then you can start editing.

- 8 Create one final new bin and rename it Timelines. This bin will be used to store the timelines we'll need to create for this project.

NOTE There are two additional types of bin available in DaVinci Resolve: Smart Bins and Power Bins. You'll learn more about each of these in the next lesson.



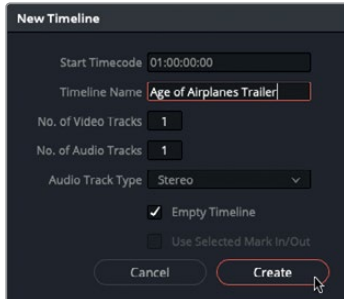
Of course, this simple exercise has had you creating just three bins but there's nothing stopping you from creating as many or as few bins that you think you'll need to be organized. Feel free to review the footage and create as any additional bins as you require. You can also create bins within bins too by making sure you've got an existing bin selected before you choose the option to make a new bin.

Creating the First Assemble

Someone once said that the hardest part of writing a book is starting the first chapter. Indeed, the same is true for editing; but with sounds and moving pictures rather than words on a page. Placing those first few clips into an empty timeline can be quite daunting. However, once you have begun assembling the footage you can begin to see what's working, what doesn't work, and what might be coaxed into working with a bit of effort on your part as the editor.

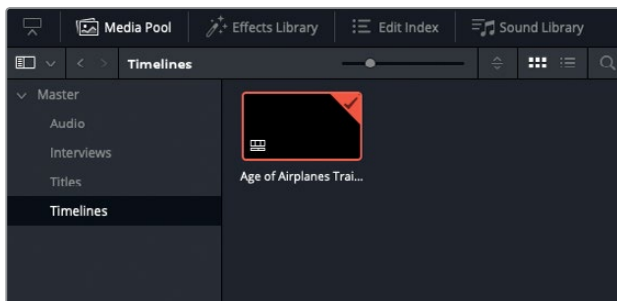
To start this process you'll need a *timeline*.

- 1 Select the Timelines bin you created at the end of the previous exercise and choose File > New Timeline or press Command-N (macOS) or Control-N (Windows)



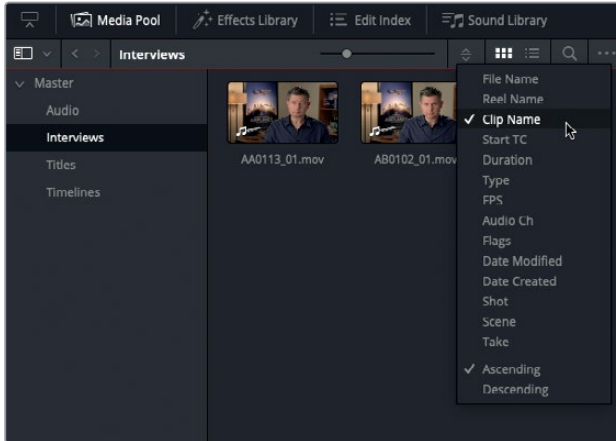
- 2 In the Timeline Name field in the New Timeline window, type *Age of Airplanes Trailer*. Leave all the other options at their defaults and click Create.

A new timeline is created in the selected bin and additional controls have appeared in the timeline window.



NOTE For this introductory lesson you don't need to be concerned with the number of timeline tracks or the audio track type. In later lessons you will learn how to configure your audio and track types based on whether you are working with mono or stereo clips.

- 3 Select the Interviews bin. If required, click the sort menu and choose to sort the clips by Clip Name in Ascending order.



- 4 Double-click the clip **AA0113_01.mov** to open it in the Source Viewer.
- 5 Play the clip from the beginning to the end.



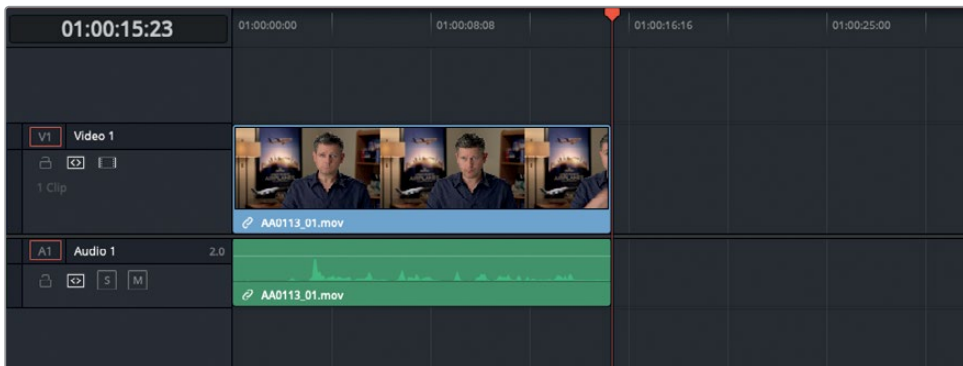
In reality we probably don't want to use the whole of this clip, but we can choose to remove the unwanted parts of this later. There are never really any right or wrong ways to edit; just more or less efficient ways.

- 6 Drag the clip from the source viewer to the timeline viewer.

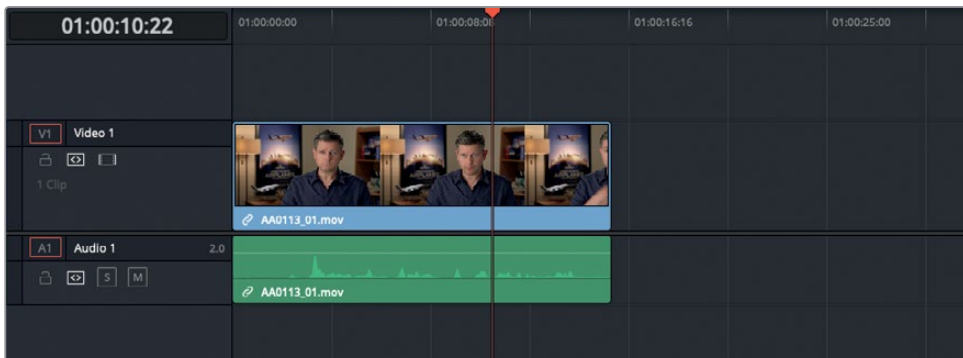


A series of editing overlays appear detailing the different types of edits available to you in DaVinci Resolve. Seasoned editors probably recognize many of these options from other NLEs, though some are specific to DaVinci Resolve. The default is Overwrite.

- 7 With the Overwrite edit overlay highlighted, release the mouse. Your first clip is edited into the timeline.



- 8 Play the clip back in the timeline and stop after Brian says the line “... shoot the real world.”



This is where you'll make your next edit.

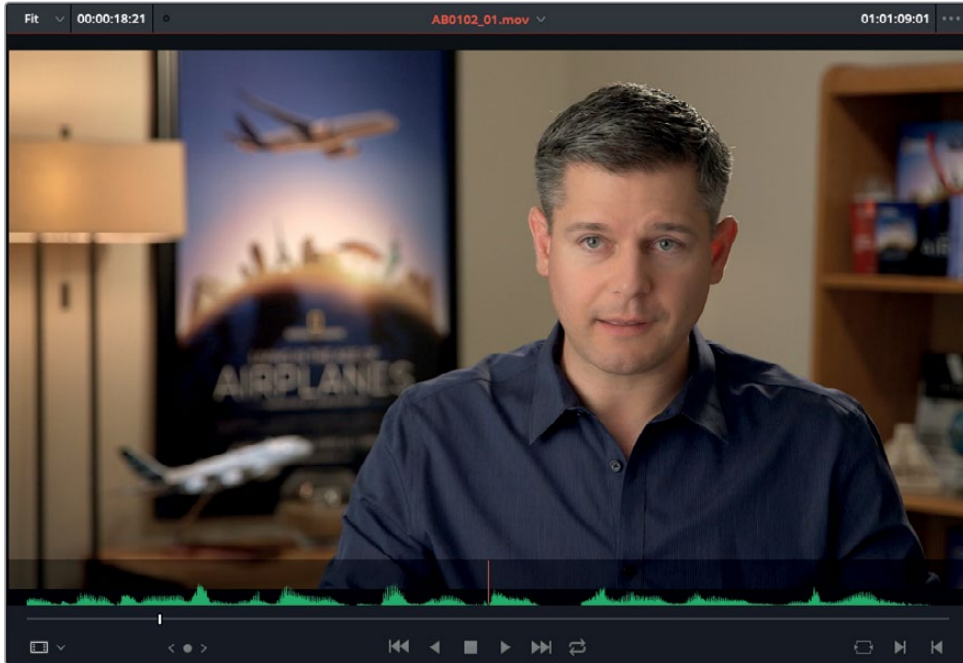
Controlling Playback

One of the important parts of learning to edit is effectively controlling the playback of your video. Whilst you could use the transport controls underneath the source or timeline viewers, keyboard shortcuts are much more effective. DaVinci Resolve's default keyboard layout supports all the usual shortcuts for playback professional editors around the world will recognize. For example, you can use the spacebar to start and stop playback and the left and right arrow keys to move forward and back one frame at a time. More experienced users will be happy to know that the J, K and L keys also control playback at different speeds. To explore DaVinci Resolve's keyboard layout in more detail you can choose DaVinci Resolve > Keyboard Customization.

- 9 In the Interviews bin, double-click **AB0101_01.mov** to open it in the source monitor. Play this clip through from the start. We only want to use a part of this clip. When working with clips with audio like this, it's useful to see a representation of the audio waveform along with the video in the source viewer.
- 10 In the source viewer's options menu, select "Show Zoomed Audio Waveform".



How cool is that? Now as you scrub or play through this clip you can see from the waveform where he starts and stops speaking. Nice!



- 11 Play the clip from the start once more and then stop playback just before Brian says “If it was possible to shoot it, we wanted to go shoot it...” (at around 01:01:11:07).

NOTE Throughout this book timecode references are used as guidelines for where the authors believe the edits work best. However, please feel free to explore the footage and use different locations if you feel there are better choices. Editing is, after all, a subjective as much as a creative endeavor.

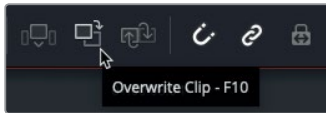
- 12 Press I to set an In Point at this location.



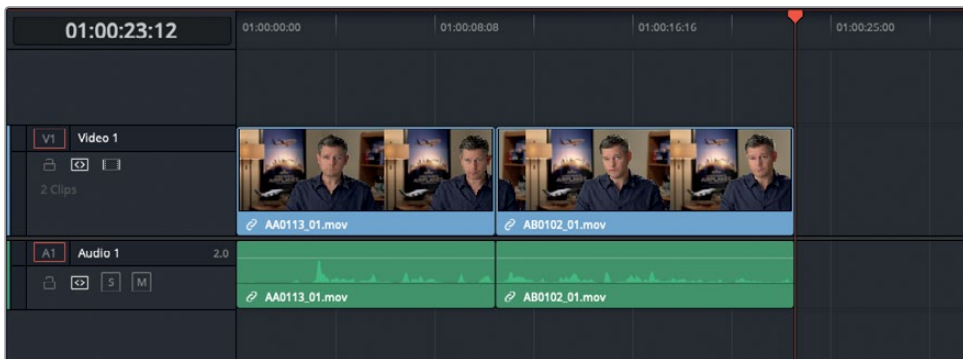
- 13 Play the clip through and stop after Brian says "... everything was real" (at about 01:01:23:20).



- 14 Press O to set an Out point at this location.
- 15 In the timeline toolbar, click the Overwrite Clip button, or press F10.



NOTE If you are using DaVinci Resolve on macOS you may need to configure your keyboard settings in System Preferences to “Use F1, F2, etc. keys as standard function keys” to use the default editing shortcuts. Alternatively, you can use the fn key with any F-key to override the macOS shortcuts.



The second interview clip is edited into the timeline starting at the position of the timeline playhead and using only the portion marked between the in and out points in the source. The end of the first clip has been overwritten by the new clip.

- 16 Press Up Arrow on your keyboard to move your timeline playhead back to the edit between the two interview clips.
- 17 Press / (slash) to review the edit.

The edit is successful enough, but it’s a pretty nasty jump cut. You’ll need to add some more footage around this interview to flesh out the story.

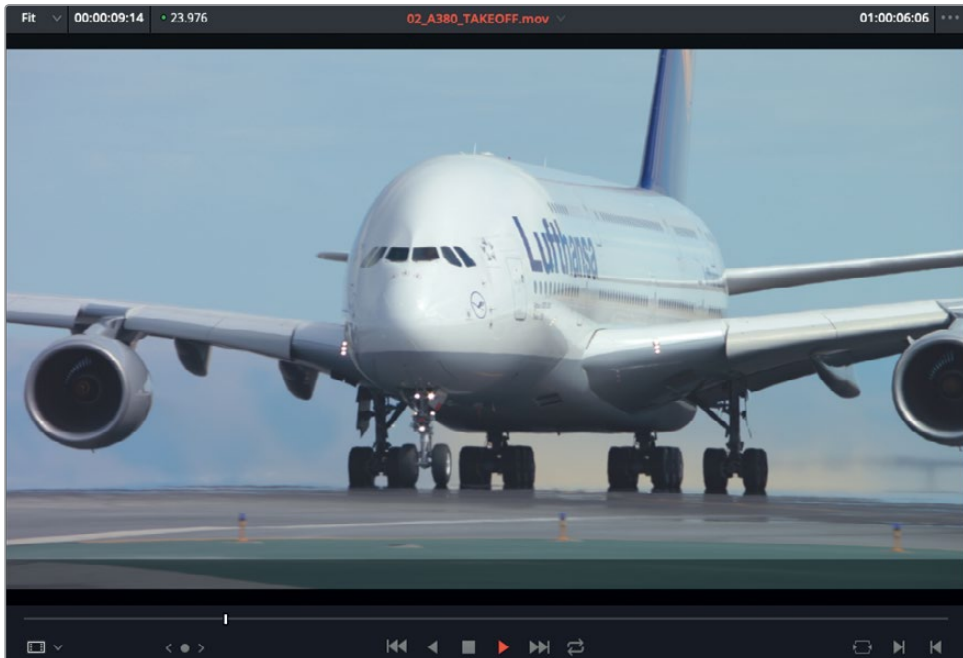
Three-point Editing

With a few notable exceptions, every edit you perform is generally referred to as a three-point edit. This means that DaVinci Resolve is calculating what you want to be edited and where you want it edited. In the previous example, the in and out points you marked in the source were the first two points required; the third point was the position of the playhead in the timeline. When you edited the first interview clip into the timeline you were also using three-point editing; even though you hadn't set any in or out points, the software used the clip in the source viewer from the beginning (the implied in point) to the end (the implied out point) and placed it at the beginning of the timeline, not because it was the first clip but because that was where the playhead was. Simple, eh? Throughout these exercises try to work out the rules of three-point editing that Resolve is following and how the in and out points (real or implied) are being used to complete the edits. In later lessons you'll also be making some four-point edits and edits that use in and out points in different ways!

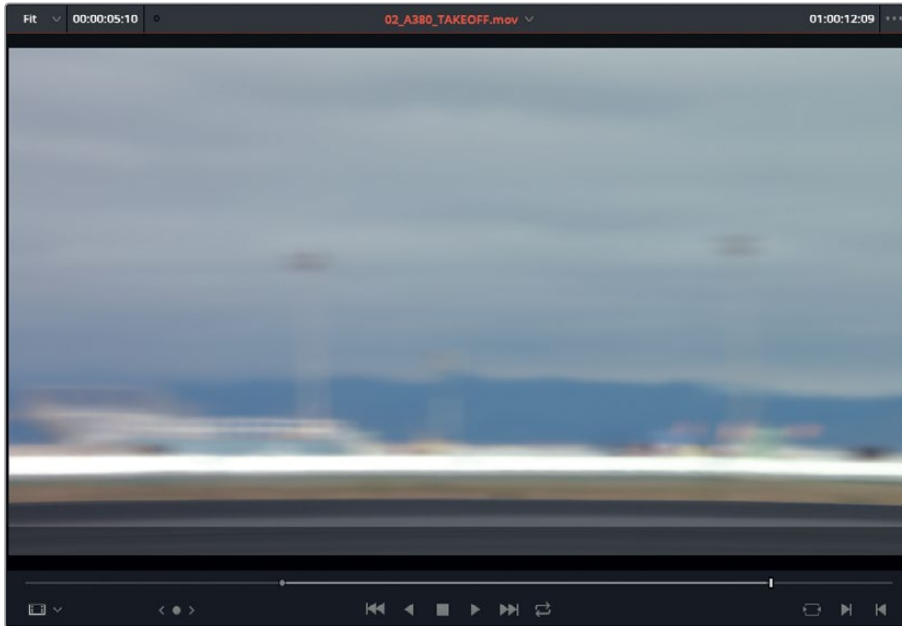
Insert Edits

Ok, time to add some B-Roll footage to bring Brian's passion for airplanes alive.

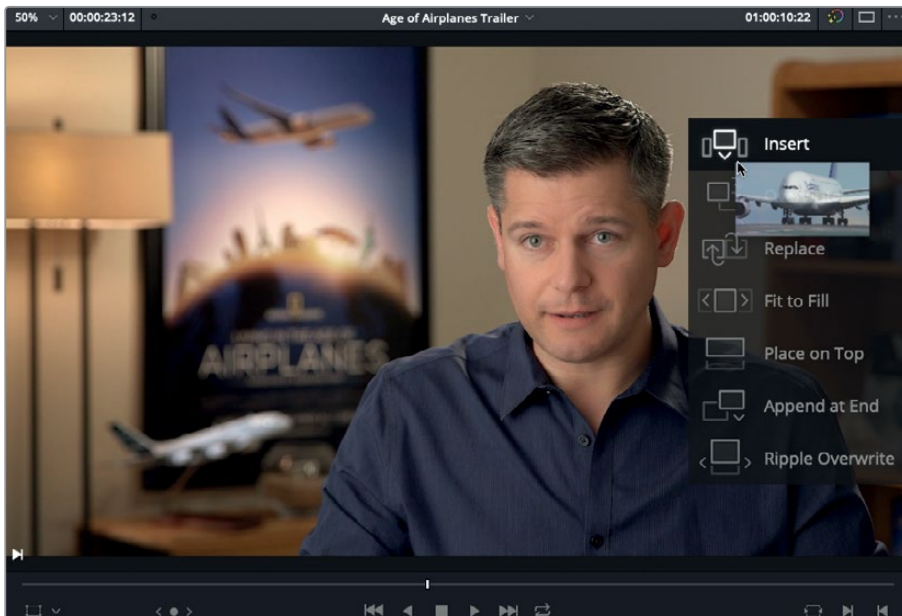
- 18 In the Master bin, double-click the **02_A380_TAKEOFF.mov** clip to load it in to the source viewer. Play the clip from the start to review the footage.



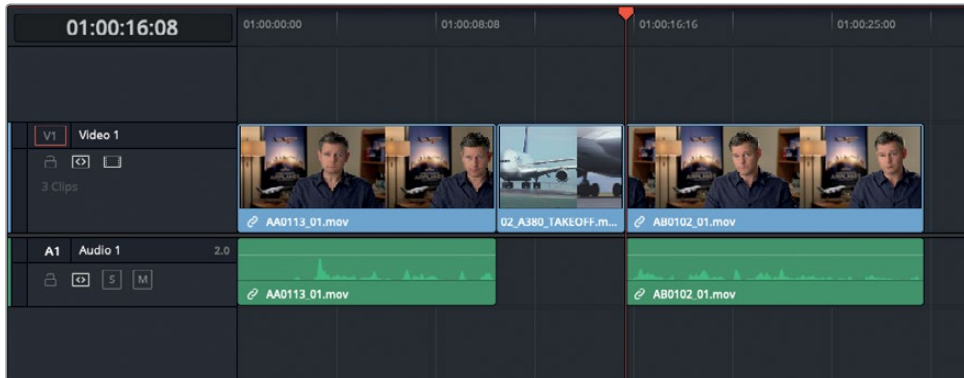
- 19 Set an In Point a second or so before the plane's wheels begin to lift off the runway (around 01:00:07:00).
- 20 Set an out point once the tail of the plane has left the frame.



- 21 Making sure your timeline playhead is still on the edit point between the two interview clips, drag the clip to the Insert overlay in the timeline viewer.



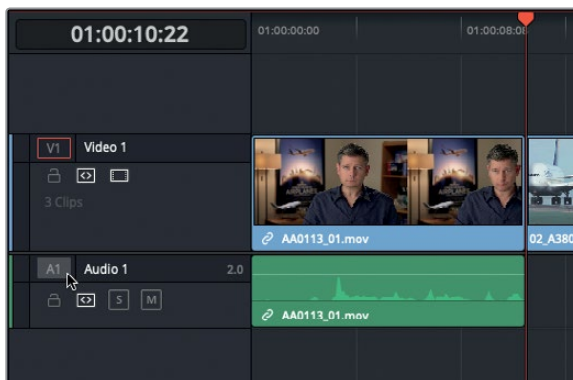
The clip is added in between the two interview clips in the timeline, but has been *inserted* between them rather than *overwriting* the clip after the playhead.



- 22** Move the timeline playhead back to the edit between **AA0113_01.mov** and **02_A380_TAKEOFF.mov**. This will be the location for your next edit.

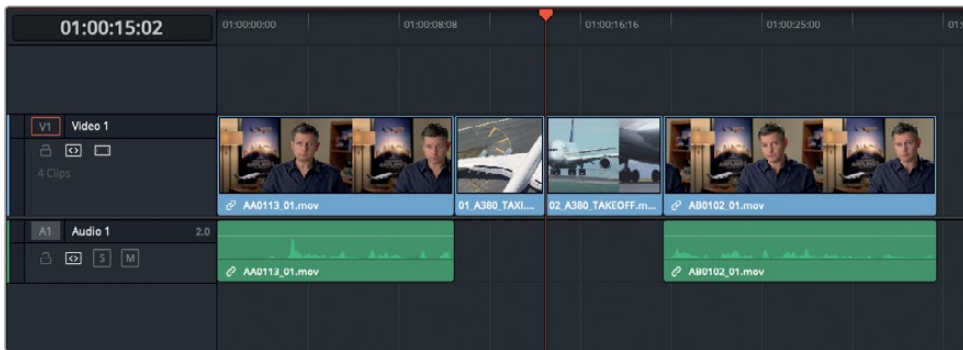
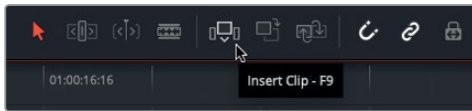
NOTE Using the up and down arrow keys are fast ways of moving between the different edit points in your timeline. If you prefer, you can always drag the timeline playhead and it will snap to the nearest edit point so long as your Snapping option is enabled. Press N to toggle snapping on or off.

- 23** Double-click **01_A380_TAXI.mov** from the Master bin in the Media Pool.
Play the clip through to review. This is a nice overhead shot of the same type of plane as you've just edited into the timeline, but the audio is a little distracting.
- 24** In the timeline, click the red outlined A1 Destination Control for the track Audio 1.



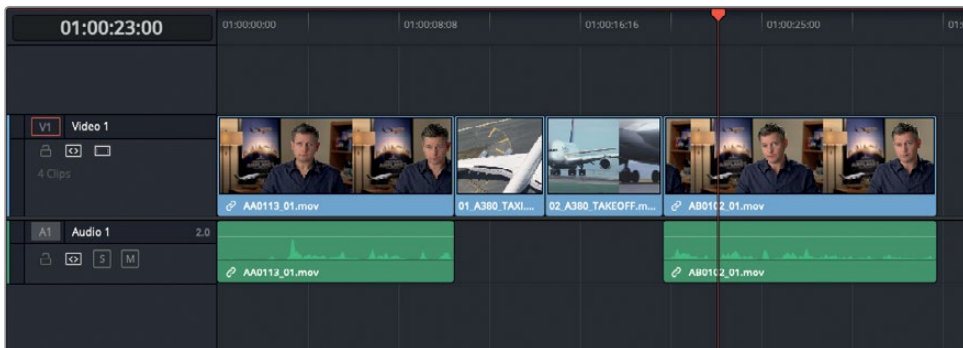
These destination controls allow you to specify which parts of the source audio or video are going to be edited into the timeline. By disabling the A1 control you will no longer automatically edit the audio from the source clip.

- 25** Click the Insert Clip button in the timeline toolbar, or press F9 to insert the new clip (sans audio) into the timeline.



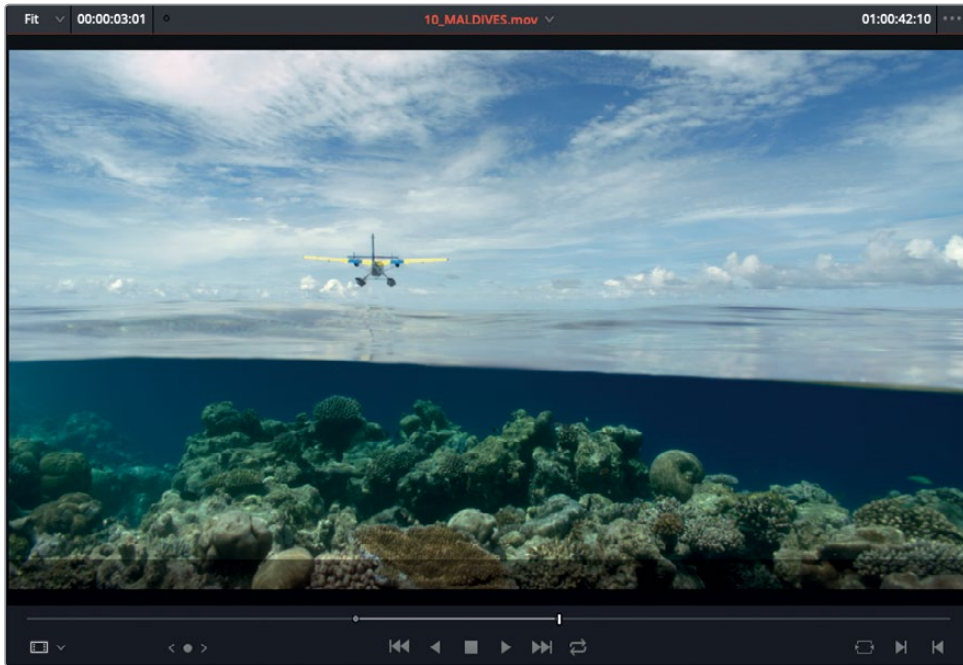
Cool. That's looking a little more interesting. You'll now insert a clip to split an existing clip.

- 26** In the timeline, play through the second interview clip and stop after Brian says "If it was possible to go shoot it, we wanted to go shoot it".

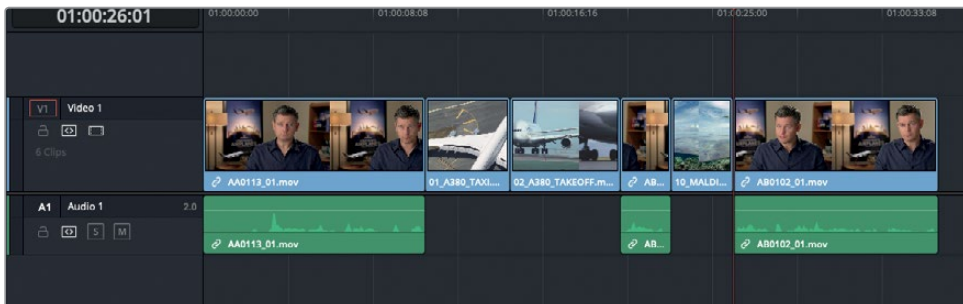


This will be the location for your next edit.

- 27** In the Media Pool double-click **10_MALDIVES.mov** and review the clip in the source viewer.
- 28** Set an in point as you see the shadow of the plane begin to pass across the coral.
- 29** In the source viewer type +300 to jump the playhead forward 3 seconds.
- 30** Press O to set the out point.



- 31 Press F9 to insert the clip into the timeline at the playhead position.



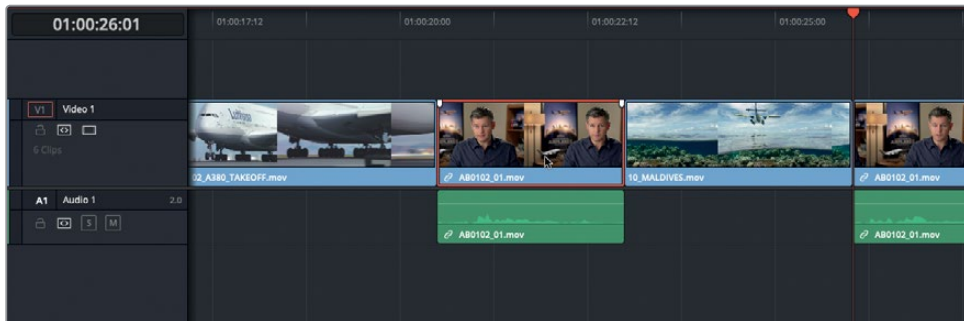
Did you see how this edit has inserted the marked source clip by splitting the existing interview clip's audio and video, even though we only had video to edit? This happened because the auto select control for the Audio 1 track is automatically enabled. You'll learn more about the auto select controls in the later lessons.

Removing the Excess

Ok, your edit is looking pretty good, but you're now at the stage where you're probably thinking it may benefit from a little bit of trimming to remove some of the unwanted portions of the footage.

- 1 Move the timeline playhead to the start of the middle interview clip and press Command-= (macOS) or Control-= (Windows) once or twice to zoom in better on this clip.

- 2 Option-click (macOS) or Alt-click (Windows) the video portion of the clip **AB0102_01.mov** in the timeline.

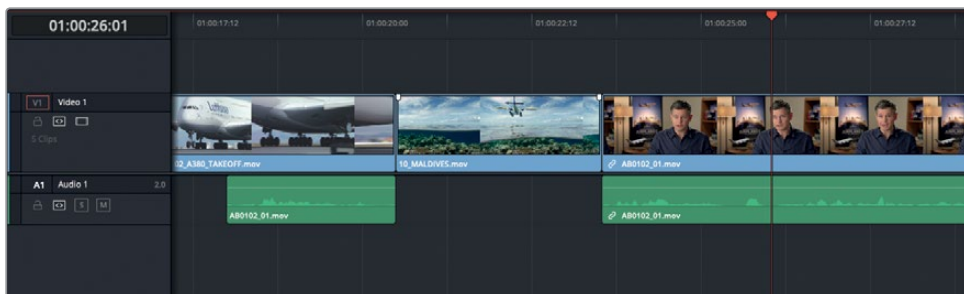


Do you notice the small chain icons on the video and audio of this clip? That means the two parts of this clip are *linked*. This can be useful if you wanted to remove or move both parts of this clip (meaning it would be quite difficult to move them out of sync with each other for example). By using the Option key (macOS) or Alt key (Windows) you're momentarily overriding the linking to select just the video portion of the clip.

NOTE If you're selecting both parts of the clip with the Option key (macOS) or the Alt key (Windows) make sure the Link Selection function is currently active.

- 3 Right-click the selected video clip and select Ripple Delete from the shortcut menu, or press Shift-Delete (Backspace).

The video portion of the clip is removed and the remaining audio tucks nicely under the preceding shot of the A380 taking off.



Did you notice what else happened in the timeline? Because you performed a Ripple Delete, it meant you didn't leave a gap and the rest of the footage in the timeline moved up. More to the point, the audio and video in the last interview clip remained in sync. Again, this is due to the auto select control being enabled on all tracks by default.

NOTE If you want to see what would happen with the auto select control looking out for you, undo the last step and disable the auto select control for the Audio 1 track and repeat the last few steps. Remember to re-enable auto select for Audio 1 afterwards.

Another way to remove sections of clips from your timeline is using in and out points.

- 4 Play through the third interview clip on the timeline.

You're going to remove the line "...stay at that location longer..." as it's a little repetitive and unnecessary.

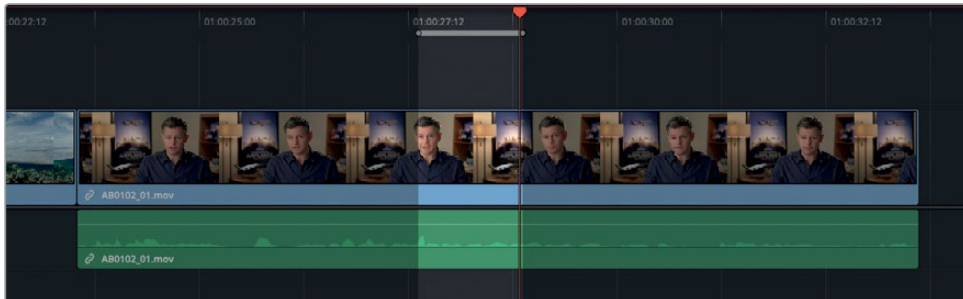
- 5 Click the timeline viewer's options menu and choose "Show Timecode Overlays".



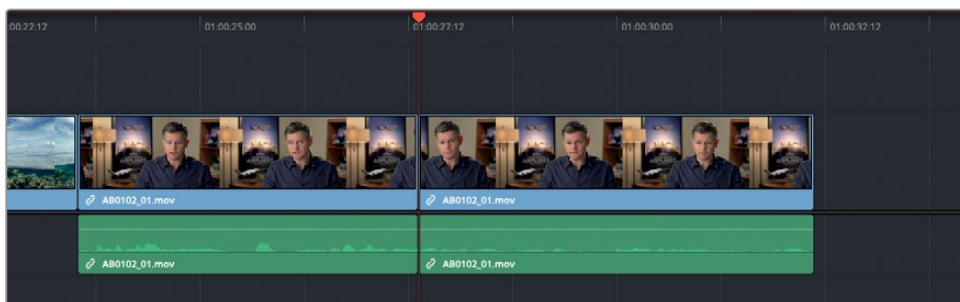
You now see small overlays in the timeline viewer that display the source timecode of the timeline clips.



- 6 Play through the last clip on the timeline and set an in point just before Brian says "... stay..." (at 01:01:17:21 using the timecode overlays).
- 7 Add an out point after he says "...longer..." (at 01:01:19:02 using the timecode overlays).



- 8 Press Shift-Delete (Backspace) to ripple delete the portion between the in and out points.



- 9 Press / (slash) to preview the new edit.

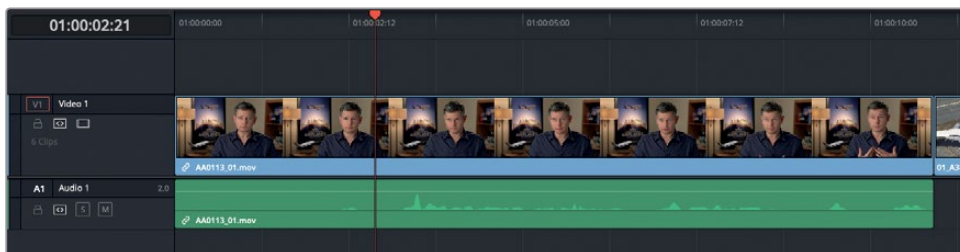
Great. That's tidied up that part of the timeline, now you'll turn your attention to the first clip.

Trim Edit Mode

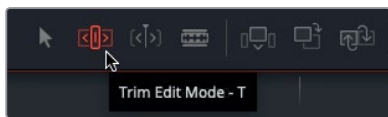
- 1 Press Shift-Z to zoom back out from your timeline.
- 2 Press the Home Key to move the playhead back to the beginning of the timeline.
- 3 Press Shift-Z to return to the previous zoom level.
- 4 Play through the first clip.

Obviously there's some unwanted portion of his interview we need to trim off at the beginning here.

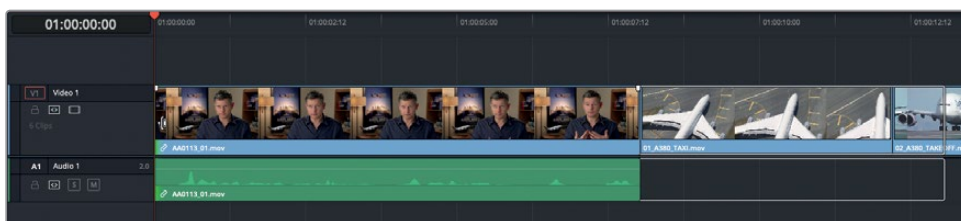
- 5 Place your timeline playhead just before Brian says "In this film..." (at about 01:00:53:05 using the timecode overlays in the timeline viewer).



- 6 Press T to enter Trim Edit Mode.
The Trim Edit Mode toolbar button becomes highlighted.



- 7 Click the beginning of the first clip and drag the edit to the right until it snaps to your playhead.



TIP If snapping isn't enabled, just press N to quickly enable it during the trimming operation.

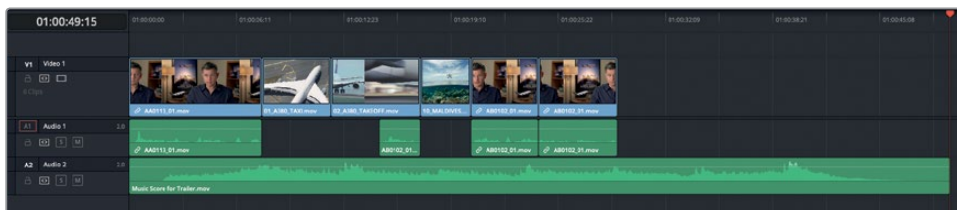
8 Press A to return to Selection edit Mode.

Notice that because the audio and video of this clip are linked, you're trimming both parts of the clip together and because you are in trim edit mode you're automatically *rippling* the timeline; all clips in the timeline on *all auto select-enabled* tracks *after* the selected edit are being rippled to maintain their sync'ed relationships.

Adding More Tracks

Now that you've started refining the timeline more, you'll possibly want to add the music and then build in the final pictures.

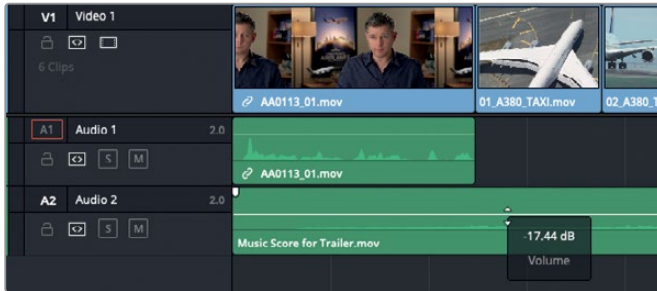
- 1 Move your playhead back to the beginning of the timeline.
- 2 Select the Audio bin and locate the clip **Music Score for Trailer.mov**.
- 3 Drag this clip directly from the bin to the Place On Top overlay in the timeline viewer.
- 4 Press Shift-Z to show the entire timeline.



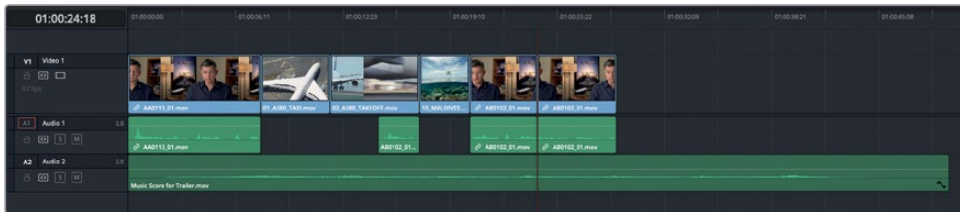
Despite its name, the Place on Top edit has actually added a new audio track *below* your existing audio tracks. The Place on Top edit will actually place the edited clip into the first available empty track in your timeline, working its way upwards through the video tracks, or downwards through the audio tracks. If it can't find an empty timeline track for the duration of the source clip, then a new track is created to accommodate the new clip. Place on Top is useful for adding B-Roll to interviews or titles as you will see later.

You'll need to *attenuate* (lower) the level of the music clip otherwise you won't hear the interview audio.

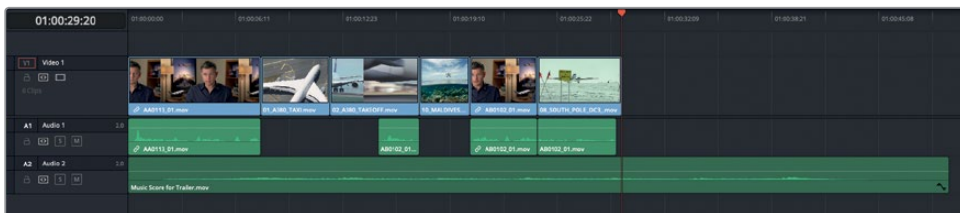
- 5 Use the volume curve on the Music Score for Trailer audio clip to lower the clip's volume by about -18db.



- 6 Move your timeline playhead to the edit point between the last two interview clips.



- 7 From the Master bin, double click the clip **08_SOUTH_POLE_DC3_.mov** to open it into the source viewer.
- 8 Press F10 to overwrite the whole of this clip at the playhead position, overwriting the video of Brian's final interview clip in the process and solving the problem of that jump cut at the same time.

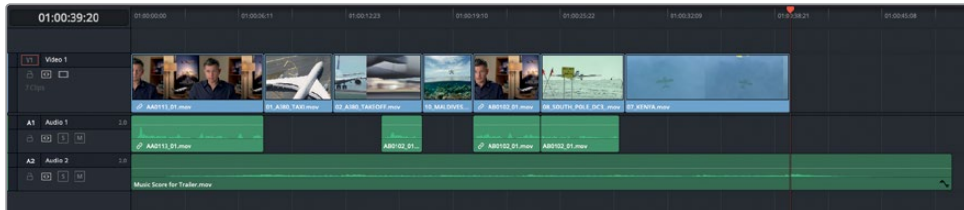


NOTE In a later lesson you will learn other options for fixing visual jump cuts.

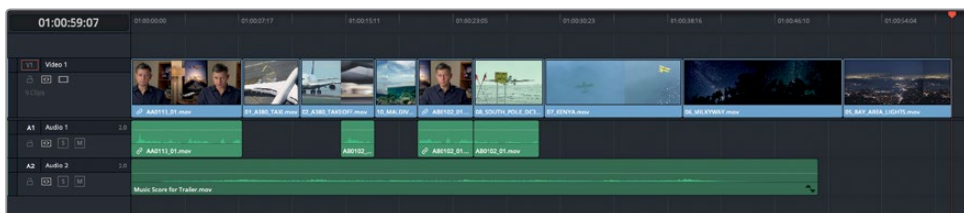
- 9 Select the clip **07_KENYA.mov** in the Master bin and drag across to the Append at End timeline viewer overlay.



The Append at End edit will use the end of the last clip on the targeted track as the *implied* in point in the timeline, irrespective of where the timeline's playhead is. It may not seem like it, but this is still a three-point edit.



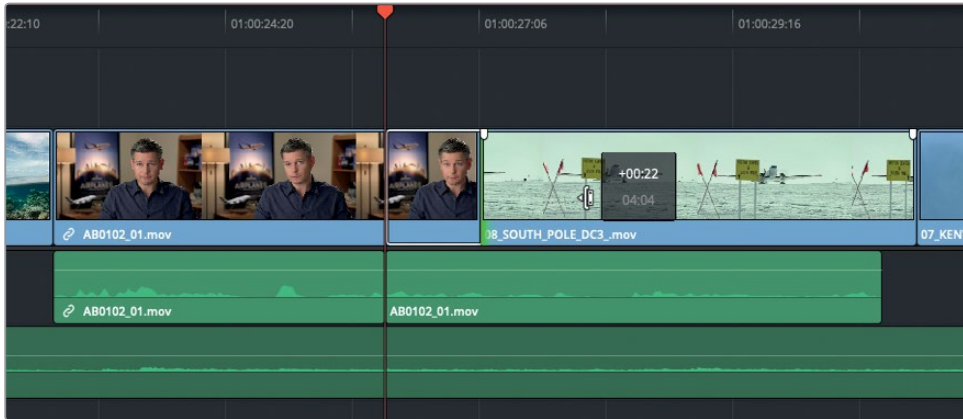
- 10 From the Master bin, select **06_MILKYWAY.mov** and use the timeline viewer overlays to perform an Append at End edit.
- 11 Double-click **05_BAY_AREA_LIGHTS.mov** to open the clip in the source viewer then press Shift-F12 to perform an Append at End edit.
- 12 Press Shift-Z to show the whole timeline.



Trimming to Duration

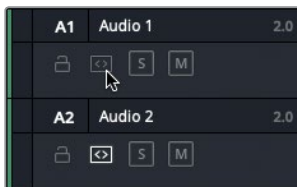
You now need to trim the extra pictures to bring your edit to time.

- 1 Place your timeline playhead at the start of **08_SOUTH_POLE_DC3_.mov** and press Command+= (macOS) or Control+= (Windows) once or twice to zoom in
- 2 Press T to enter Trim edit Mode.
- 3 Select the beginning of the **08_SOUTH_POLE_DC3_.mov** clip and begin to drag to the right to trim the clip.

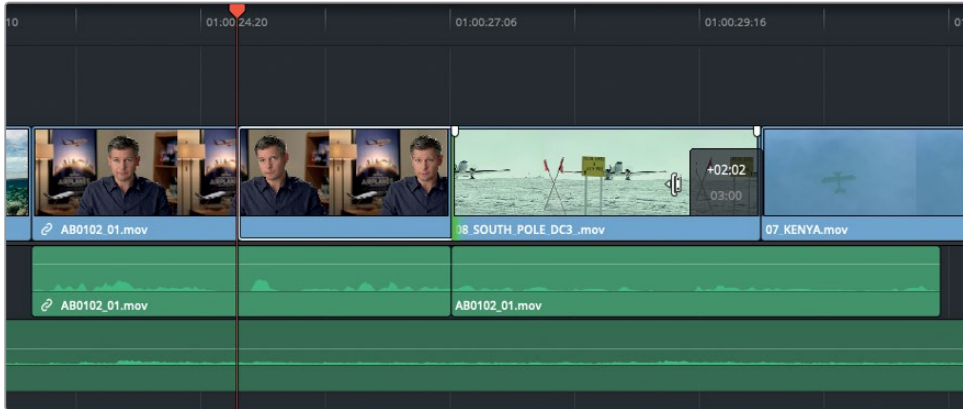


Whoa! Do you see what's happening? You're trimming the beginning of the clip forward but the interview audio is being rippled backwards!

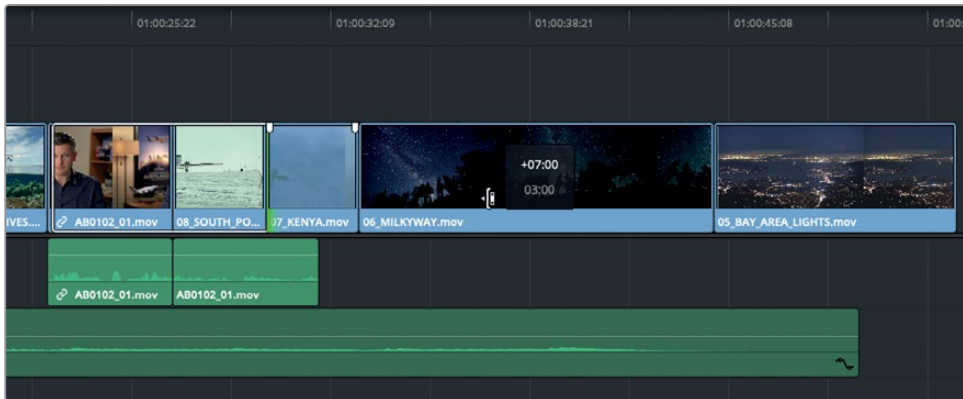
- 4 Press Command-Z (macOS) or Control-Z (Windows) to undo the last step.
- 5 Click the auto select control for the Audio 1 track to deselect it.



- 6 Repeat the trim operation in Step 3 to trim the clip but not move the Interview audio. Trim the clip so the grey duration tooltip reads about 3 secs.

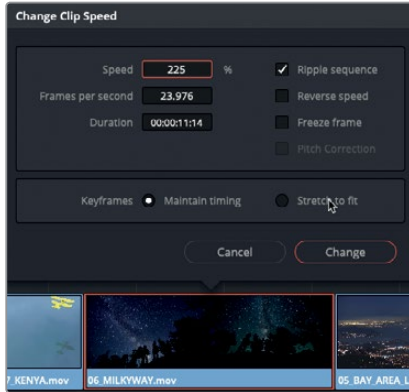


- 7 Press the down arrow key to move to the next edit at the start of the **07_KENYA.mov** clip.
- 8 Trim the beginning of this shot until the tail of the yellow plane is in shot and the clip is about 4 secs long.

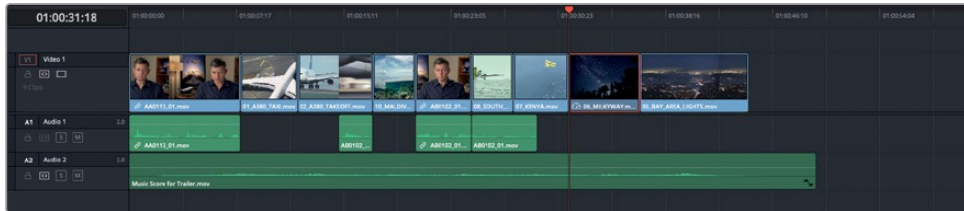


Another way to change the duration of clips and make them visually more interesting is to adjust the speed at which the clip plays back at.

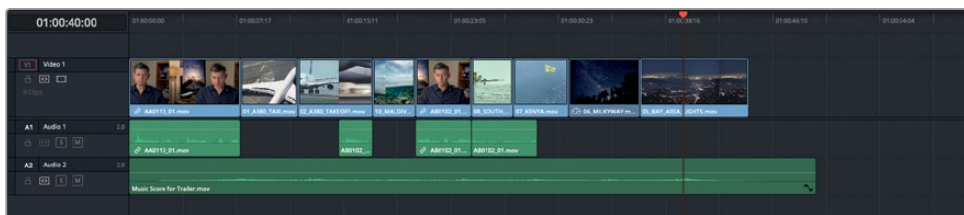
- 9 Right-click the **06_MILKYWAY.mov** clip and choose Change Clip Speed.
- 10 In the Change Clip Speed dialogue box, type 225 in the Speed % box and check the Ripple Sequence option.



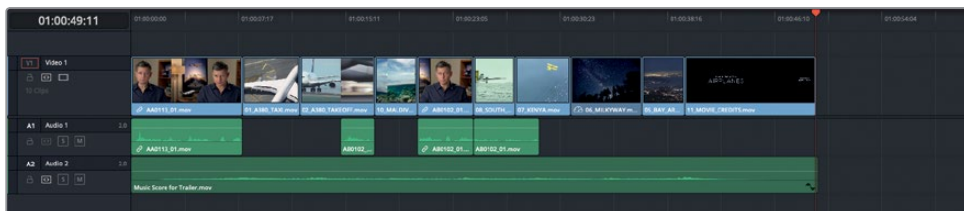
The **06_MILKYWAY.mov** clip is sped up and the trailing shot is rippled back in the timeline with its change of duration.



- 11 Play through the rest of the timeline until the final beat of the music.
- 12 Place the timeline playhead on the final beat of the music score (at 01:00:40:00 using the timecode overlays in the timeline viewer).



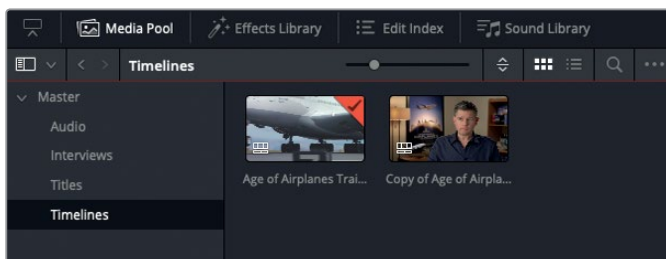
- 13 From the Titles bin, double-click the **11_MOVIE_CREDITS.mov** clip to open it in the source viewer.
- 14 Press F10 to perform an overwrite edit.



- 15 Press Shift-Z to view your entire timeline.

Before going much further, it's always a good idea to periodically save a copy of the timeline you're currently working on.

- 16 In the Timelines bin, select the Age of Airplanes Trailer timeline you're working on and choose Edit > Duplicate Clip.



A copy of your timeline appears in the same bin.

NOTE You can now continue working on the currently loaded timeline, knowing you have a backup of your work to this point. Many editors often like to rename the duplicated timeline so they know what they are looking at in the bin.

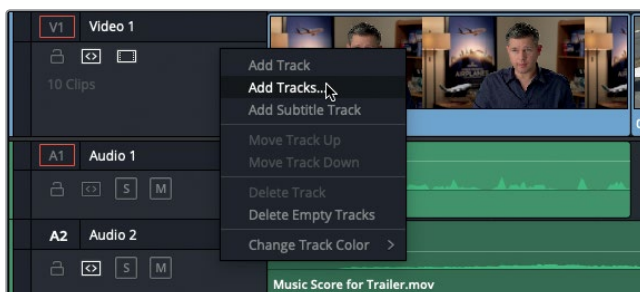
- 17 Press Home and play your timeline to review your edit so far.

Excellent. You've built a fairly sophisticated trailer. However, there's still a few things to do before the director will be happy.

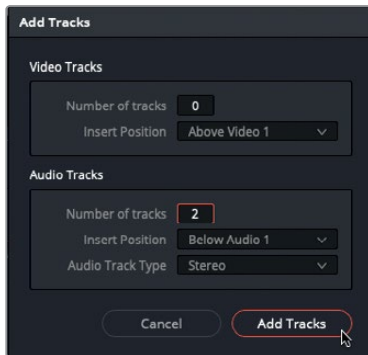
Finishing the Edit

With a backup copy of your timeline in your bin, it's now time to start finessing the edit further. You'll begin by adding some sound effects to the b-roll footage to give it more of an impact.

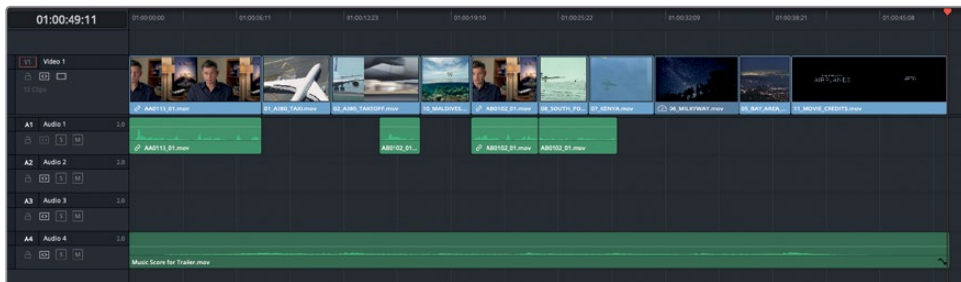
- 1 Right-click anywhere in the timeline track headers and choose Add Tracks.



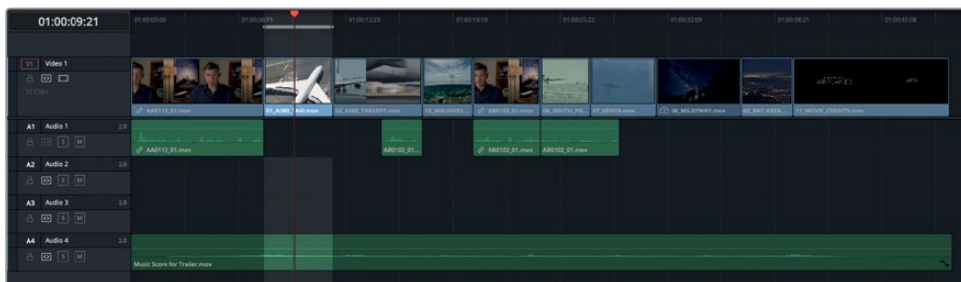
- 2 In the Add Tracks dialogue box change the number of video tracks to 0 and the number of audio tracks to 2. Ensure the Insert Position for the new audio tracks is set to Below Audio 1 and set the track type to stereo. Click Add Tracks.



The additional audio tracks have been added as specified.

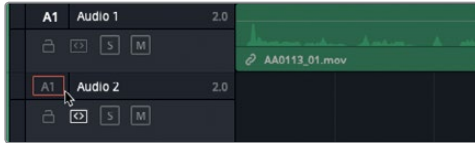


- 3 Position your timeline playhead anywhere over the second clip **01_A380_TAXI.mov** and press X.



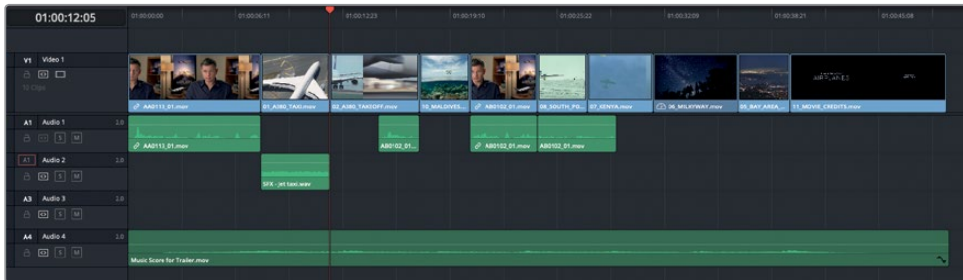
In DaVinci Resolve, X does not mark the spot, but rather marks the timeline clip under the playhead on the lowest active auto selected track.

- 4 From the Audio bin, double-click SFX – jet taxi.wav to open it in the source viewer.
- 5 In the destination controls in the timeline, drag the red outlined A1 control to A2.



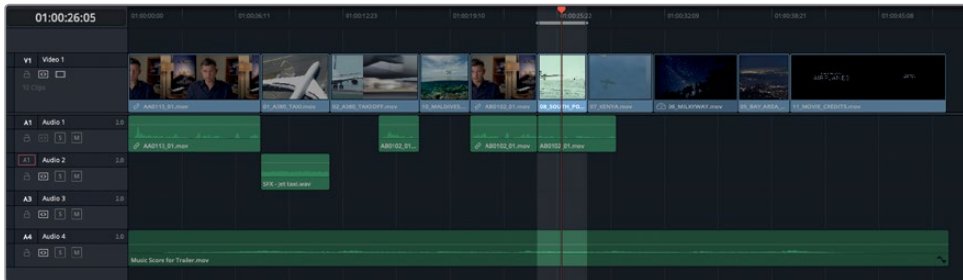
This tells Resolve you want to edit the next clip into this track.

- 6 Press F10 to perform an overwrite edit.



You have just completed a three-point edit, but this time you set the duration of the edit by using in and out points in the timeline. No in or out points were set in the source, so the implied in point was used; that is, from the start of the clip.

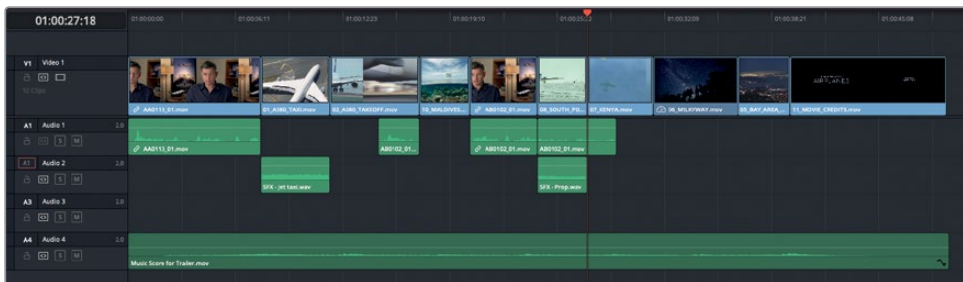
- 7 Move the timeline playhead over the clip **08_SOUTH_POLE_DC3.mov** and press X to mark the clip.



- 8 Open **SF-Prop.wav** from the Audio bin in the Media Pool.
- 9 With your source viewer playhead at the start of this clip, type +200 in the source viewer and press I to set an in point.

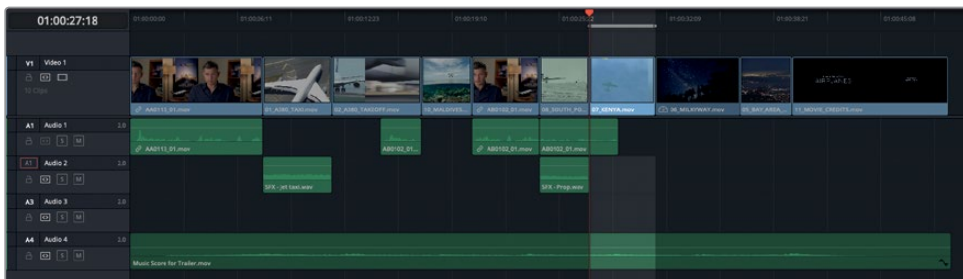


- 10 Press F10 to perform an overwrite edit.

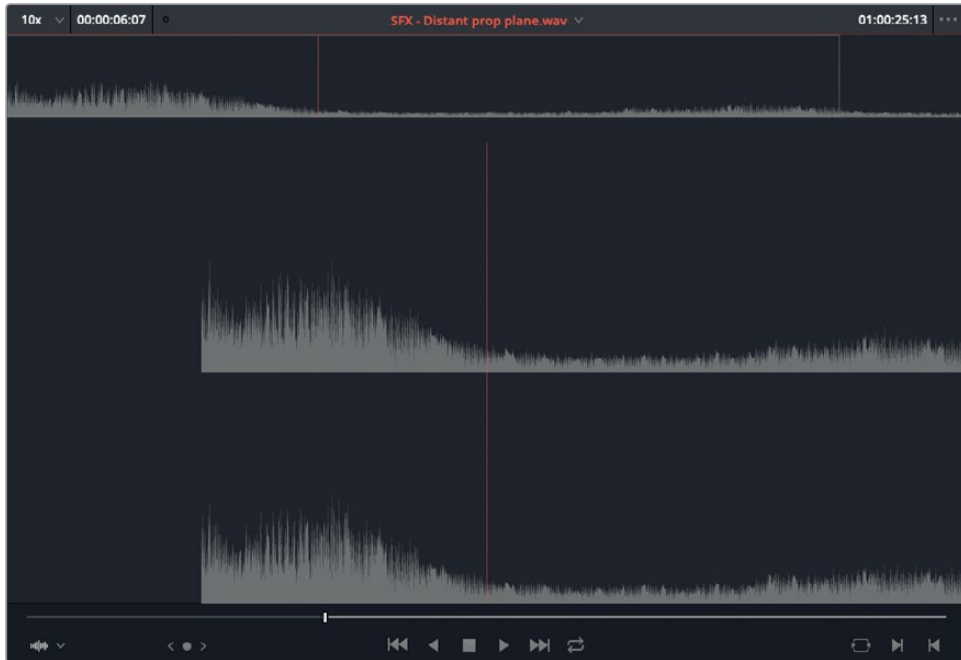


This time, because you added an in point to the source clip, Resolve uses this point when editing the clip into the timeline.

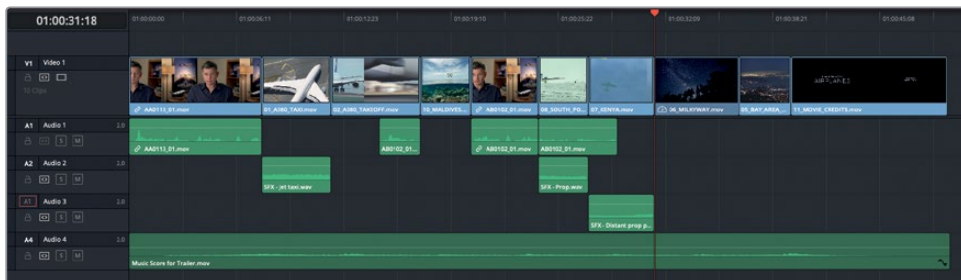
- 11 Ensure your playhead is over the next clip in the timeline, **07_KENYA.mov**.
- 12 Press X to mark the clip.



- 13 From the Audio bin, open **SFX – Distant prop plane.wav** into the source viewer.
- 14 Set an in point roughly 3 seconds from the start of this clip.



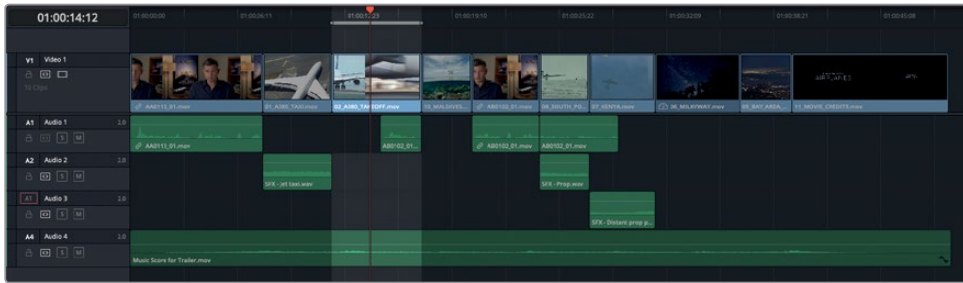
- 15 Click on the A3 destination control in the timeline track controls.
- 16 Press F10 to perform an overwrite edit.



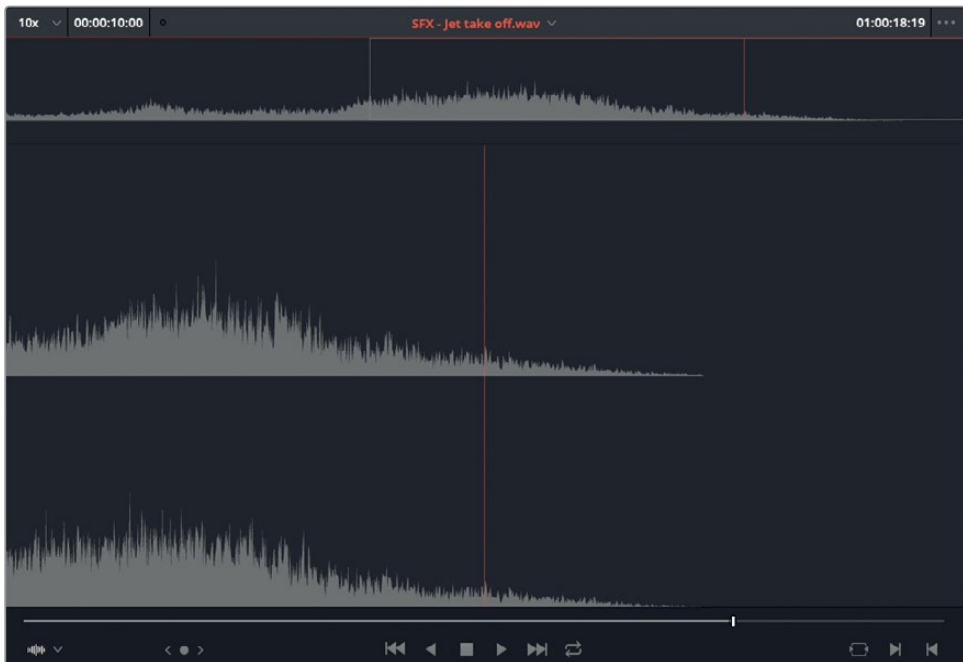
Backtiming Edits

Another editing technique that's often used and builds on the concept of the three-point edit is the backtimed edit. Backtiming an edit means you specify where you want a shot to end by just adding an out point rather than an in point.

- 1 Place your timeline playhead over the third clip **02_A380_TAKEOFF.mov** and press X to mark the clip.

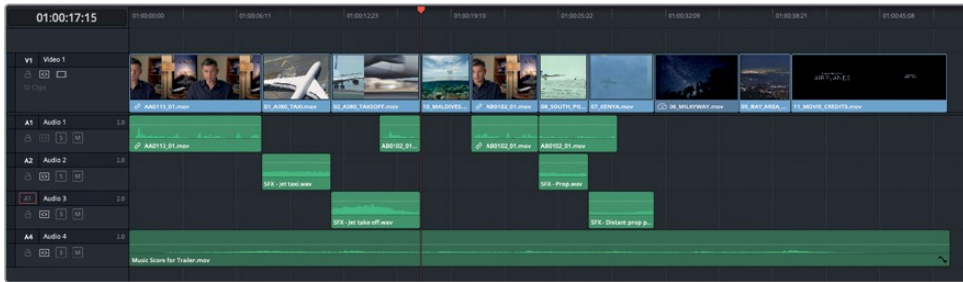


- 2 From the Audio bin, open the clip SFX – Jet take off.wav into the source viewer.
- 3 Play through the clip until the sound of the jet starts to fade away (around 01:00:18:19).
- 4 Press O to add an out point.



NOTE For backtimed edits to work you only need an out point. If necessary, you can remove an in point by pressing Option-I (macOS) or Alt-I (Windows).

- 5 Press F10 to make an overwrite edit.



This time the out point you set in the source viewer has specified where the new clip should stop. Pretty neat, yeah?

Using Replace Edits

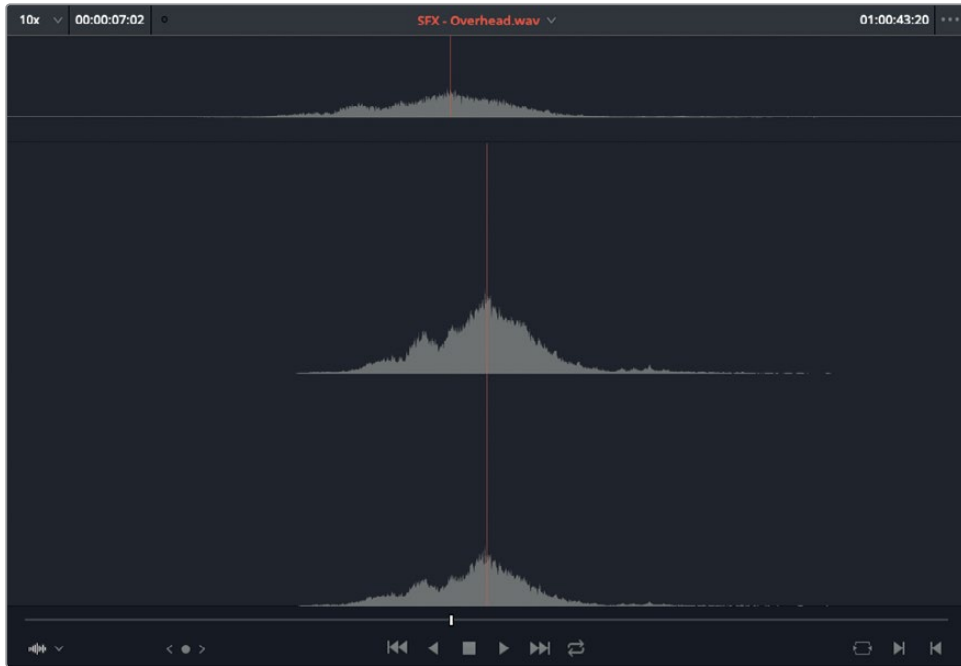
Another technique you can use to your advantage very effectively is the replace edit. The replace edit is slightly different to the three-point edits you've been using throughout this lesson in that you're not required to set any in or out points. Instead, the replace edit uses the position of the timeline and source playheads to align the edits.

- 1 Move the timeline playhead over the clip **10_MALDIVES.mov** just before you see the wings come into shot (about 01:00:40:02 using the timeline viewer overlays for V1).

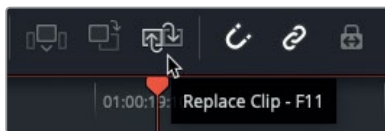


- 2 Open the clip **SFX – Overhead.wav** from the audio bin.
This is a simple sound effect file with a prominent waveform.

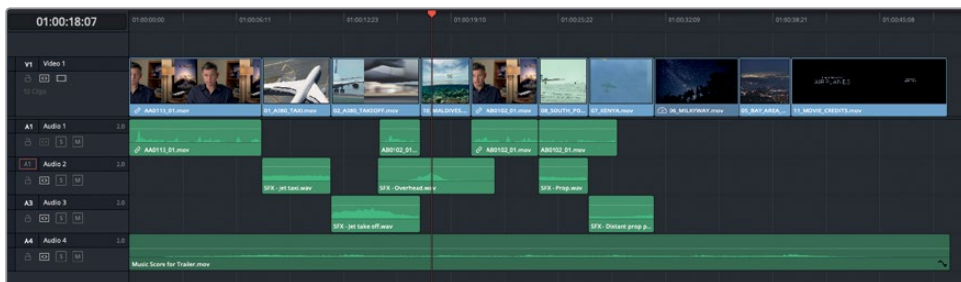
- 3 In the source viewer, position the playhead over the highest point of the waveform.



- 4 In the timeline, click the destination control to A2.
5 Click the Replace Clip button or press F11.



- 6 Press / (slash) to preview the edit.

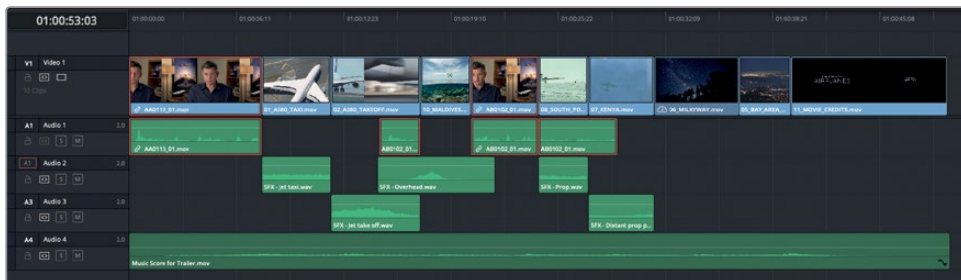


Quite effective, isn't it? You'll work with replace edits again in much greater detail in a later lesson.

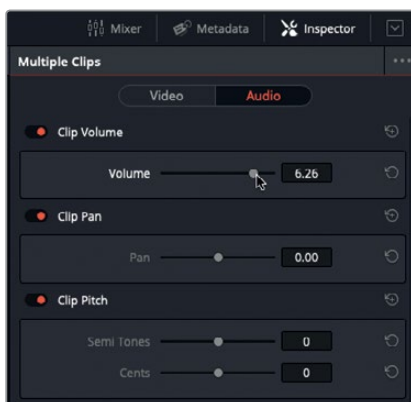
Audio Mixing Basics

Now you've got some sound effects in your edit the whole timeline has seemed to come alive and just goes to show the importance of sound. You'll work with audio much more throughout later lessons, however even at this stage it's likely that you'll need to take on some basic audio duties, at the very least so the director gets a sense of what the edit will eventually sound like.

- 1 Press A to ensure you're working in Selection Mode and then select all the interview clips on the Audio 1 track.

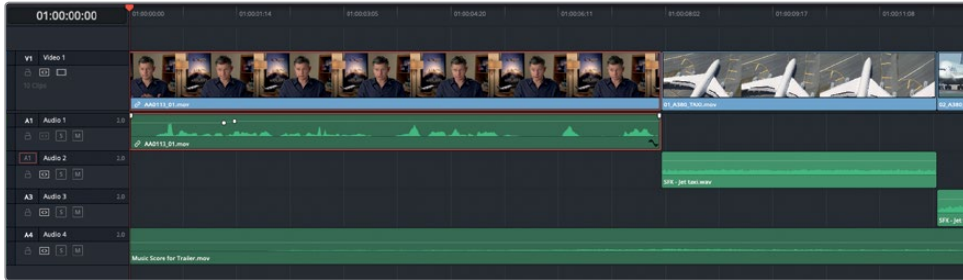


- 2 Click the Inspector button in the top right corner of the interface to open the Inspector.
- 3 Use the Clip Volume slider to raise the level of all of these clips by about 6db.



That sorts the main levels out for Brian's dialogue clips, but there's a bit of a spike at the beginning of the first clip.

- 4 Zoom in to the beginning of the first clip.
- 5 Option-click (macOS) or Alt-click (Windows) the volume curve line to add a keyframe after the spike. Repeat to add a second keyframe just after the first.



- 6 Lower the part of the audio curve before the first keyframe so the peak is about the same height as the other peaks in the clip (a change of about -5db).
- 7 Press Shift-Z to zoom back out and see the whole timeline.

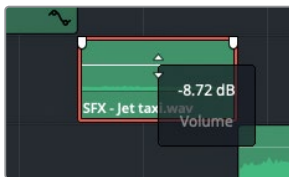
Displaying the Audio Meters?

You can see your audio levels in the edit Page by clicking on the Mixer button in the top right corner of the interface. You can then choose to show just the meters by clicking in the Mixer's Options menu (the button with three dots) and choosing Meters. This then displays the combined levels for the timeline's currently selected main bus. You'll learn more about setting mains and other buses in the audio mixing lesson.

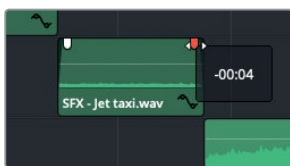
Mixing the Sound Effects

Now it's time to turn your attention to the sound effects you added earlier. Firstly you'll want to adjust the levels and then apply fades to the beginning and ends of each clip. Fortunately DaVinci Resolve has a quick way to bypass such repetitive tasks.

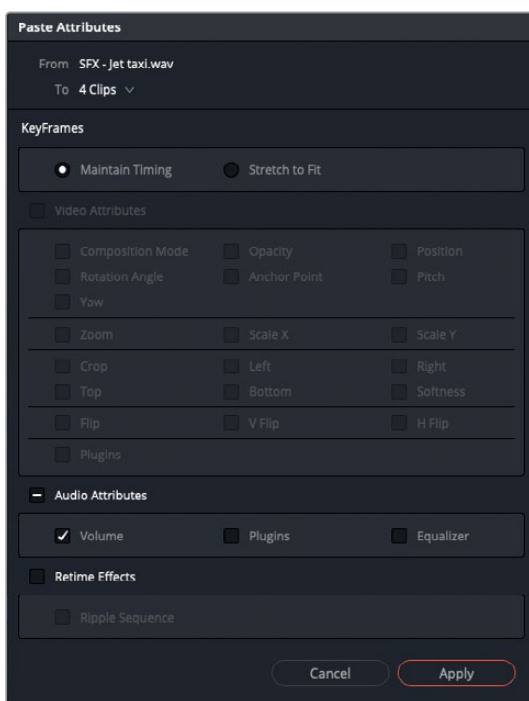
- 1 Adjust the level of the first audio clip on the Audio 2 track, the **SFX – Jet Taxi.wav** clip, by about -8db.



- 2 Use the default fade controls at the head and tail of the clip to apply a short fade in and out to the clip.



- 3 Select the clip in the timeline and choose Edit > Copy or press Command-C (macOS) or Control-C (Windows).
- 4 Select all the other audio clips on the Audio 2 and Audio 3 tracks.
- 5 Choose Edit > Paste Attributes or Press Option-V (macOS) or Alt-V (Windows).
- 6 In the Paste Attributes dialogue box check the box for Volume in the Audio Attributes and click Apply.



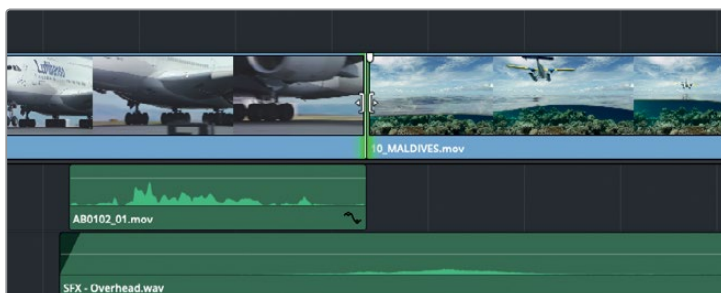
The Paste Attributes command has pasted the volume settings, including the fade handles, to each of the selected clips. You may still want to go through the clips yourself later to check they are the right level, but this is a great timesaver.

Adding Transitions

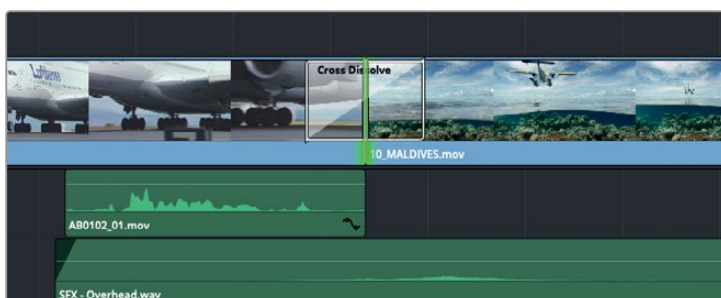
The use of transitions in your projects should always be done with great care. Any transitions you add should be done with a consideration to the story you are telling and should not be used if they begin detracting from that aim. As a wise man once said: with great power, comes great responsibility.

That said, transitions are a good way to show a change of location or time that might be a bit too abrupt for your audience if left with just a straight cut.

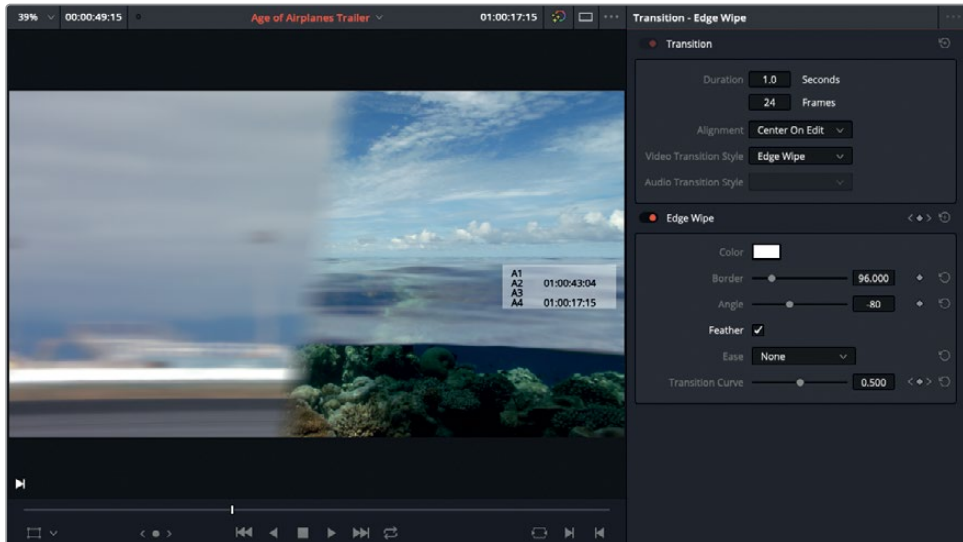
- 1 Select the edit point between **02_A380_TAKEOFF.mov** and **10_MALDIVES.mov**.



- 2 Press Command-T (macOS) or Control-T (Windows) to add the default cross dissolve transition.



- 3 Press / (slash) to preview the transition.
You'll find additional controls for your transitions in the Inspector
- 4 If necessary, zoom in on the transition in the timeline and select it.
- 5 In the Inspector, change the Video Transition Style to "Edge Wipe", change the Angle to about -80 and the duration to 12 frames.
- 6 Check the Feather box and increase the border to around 96.



- 7 Finally press / (slash) to preview the transition and channel your inner George Lucas.

NOTE You can access more transition presets by clicking on the Effects Library button from the top left corner of the interface and selecting the Video Transitions category.

Problems Applying Transitions

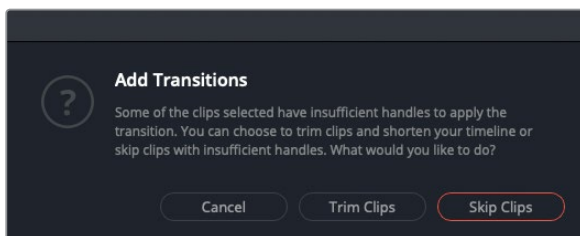
Occasionally you may have a problem applying transitions but it's good to know that you can use Resolves flexible Trim Edit Mode to help overcome these.

- 1 Select the edit point between **08_SOUTH_POLE_DC3_.mov** and **07_KENYA.mov**.



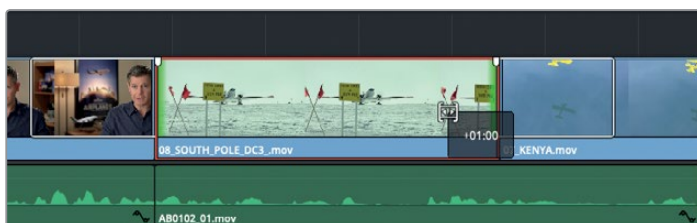
Notice the red bars on either side of the selected edit? This tells you that there's no *handles* or available media on one side or the other of the cut.

- 2 Press Command-T (macOS) or Control-T (Windows) to apply a cross dissolve transition.

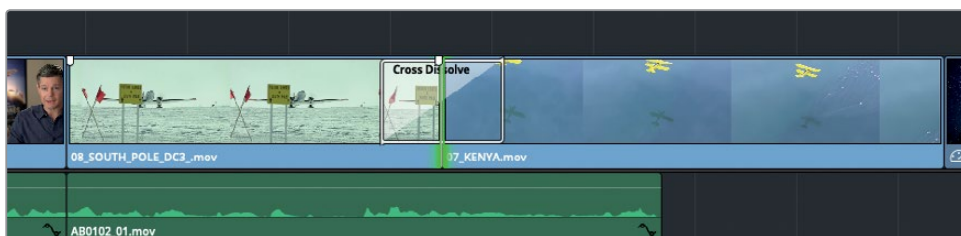


The above dialogue appears warning you that there are insufficient handles. As trimming clips to create the handles will shorten your timeline, this probably isn't something you want to happen. Instead you'll fix this issue using a slip trim.

- 3 Click Cancel.
- 4 Press T to enter Trim Edit Mode.
- 5 In the timeline, zoom in on clip **08_SOUTH_POLE.mov** so you can see the clip comfortably.
- 6 Place your mouse cursor over the filmstrip part of the clip. It will automatically become the slip trim icon.
- 7 Click and drag the clip to the right by about 1 second to slip the footage within the clip.



- 8 Reselect the edit point between **08_SOUTH_POLE.mov** and **07_KENYA.mov** and press Command-T (macOS) or Control-T (Windows) to apply the cross dissolve.



- 9 Press A to return to the Selection Mode.

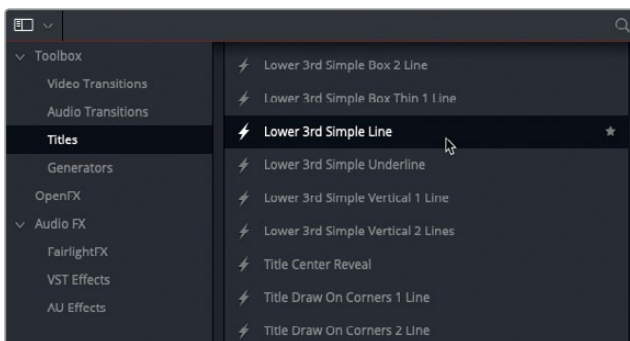
Adding Fusion Titles

The last step in this introductory editing lesson is to add a title so everyone knows who Brian is. DaVinci Resolve comes bundled with a series of templates that have been created for your use in the Fusion Page. That doesn't mean you have to be a compositing expert to use them, but it does mean that you can customize them further in DaVinci Resolve's Fusion Page without needing any additional software. In a later lesson you'll learn to create your own titles, track elements within your videos and work with green screen footage in the Fusion Page.

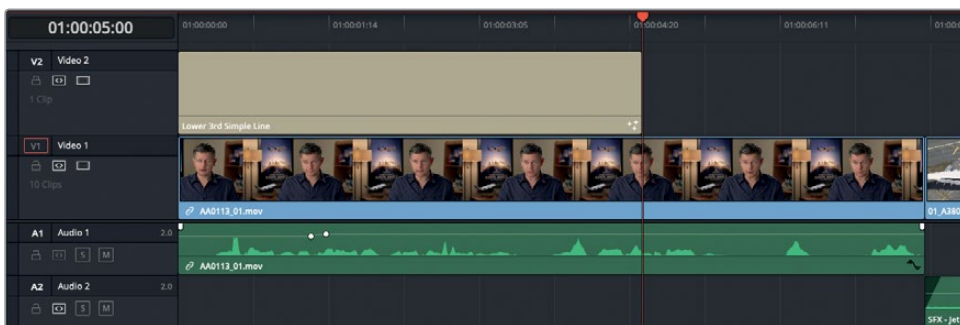
- 1 Move your playhead to the beginning of the timeline.
- 2 If necessary, open the Effects Library by clicking the Effects Library button in the top left hand corner of the Edit Page.
- 3 In the Effects Library, select the Titles category.

The Titles category lists all the standard title generators and new Fusion Title templates available.

- 4 From the list of Fusion Titles, select the template called "Lower 3rd Simple Line".

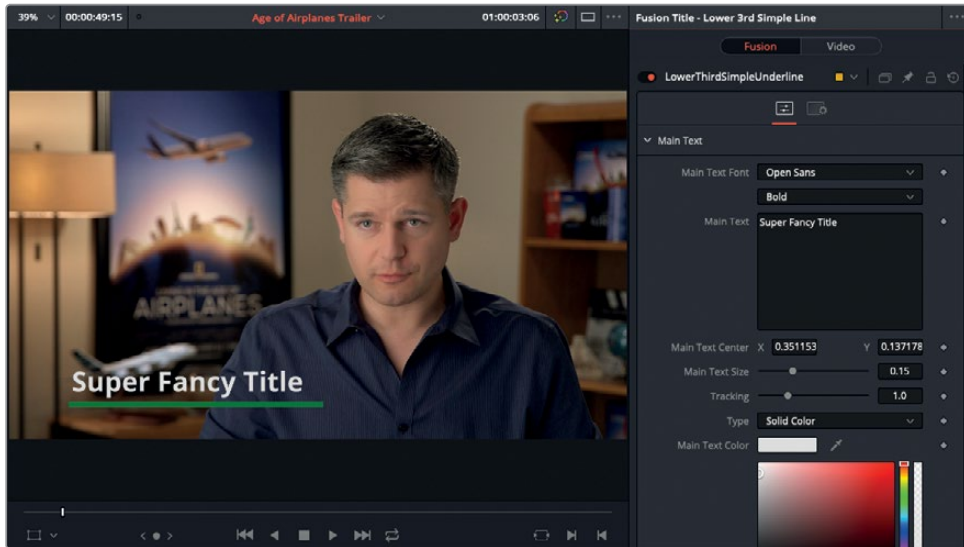


- 5 Drag the Lower 3rd Simple Line title to the timeline viewer overlays and choose Place on Top.



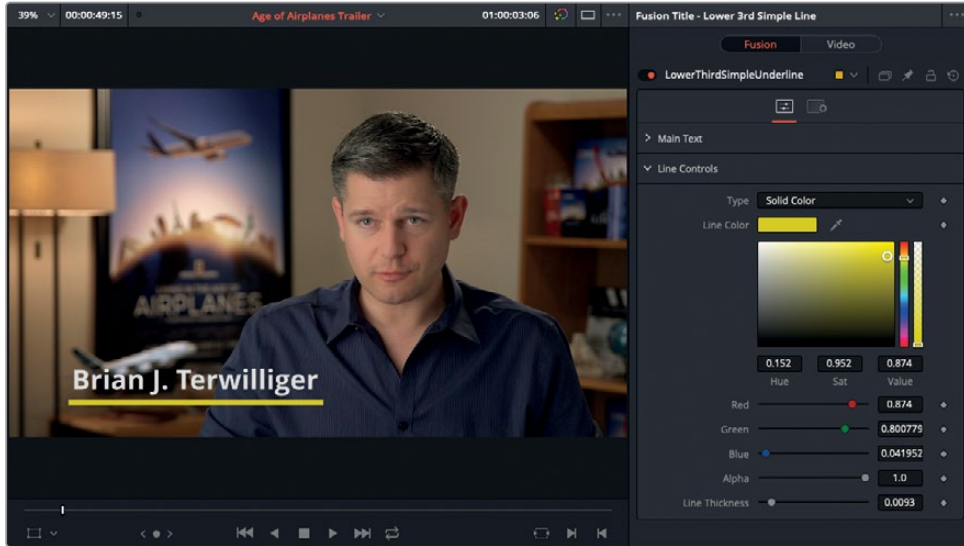
The Fusion title gets placed above the first video clip on a new track.

- 6 Place your timeline playhead over the center of the title clip.
The controls for this title automatically appear in the Inspector.
- 7 In the Inspector, double-click the Main Text bar to expand the text controls.



These controls allow you to adjust the main characteristics of the text within this Fusion Title.

- 8 In the Main Text box highlight the “Super Fancy Title” text and type *Brian J. Terwilliger*.
- 9 Double-click the Main Text bar again to collapse the text controls and then double-click the Line Controls bar.
- 10 Change the color of the line from green to your preferred shade of yellow.



- 11 Finally, in the timeline, trim the end of the title to the end of the first clip on Video 1. Allow the title to cache and playback.

NOTE This title has built-in keyframed animation to bring the title in and out. In a later lesson you will learn how you can adjust these keyframes for perfect control over your text animations.

Carry on Cutting

Congratulations! You have just completed the first lesson in this book and should now have a more rounded understanding of the editing toolset within DaVinci Resolve 15. However, before you move to the next lesson you might want to put your new skills to the test as there's still a few things you can do to finesse this edit. Try and accomplish these tasks on your own. Don't forget you should duplicate your timeline to create a backup version before you make any major changes! Good luck!

- 1 Trim each of the sound effect clips on Audio 2 and Audio 3 so that there's more overlap as one sound effect fades out and the other fades in.
- 2 Add keyframes to the music score clip on Audio 4 so that the volume rises after Brian's last line.
- 3 Use the Razor Edit Mode to cut up Brian's last line and position it further down the timeline to create more pacing for his dialogue.
- 4 Add more Fusion Titles for each airplane clip to highlight the many different locations (Maldives, South Pole, Kenya) that feature in this film.

Lesson Review

- 1 True or False: DaVinci Resolve automatically saves all new projects to your computer's Desktop?
- 2 What element is most often used to organize imported clips in DaVinci Resolve?
 - A) Folders
 - B) Thumbnails
 - C) Bins
- 3 What types of edits can be performed using the toolbar buttons above the timeline?
 - A) Overwrite
 - B) Insert
 - C) Append at End
- 4 True or False: DaVinci Resolve only allows you to manually add one video or audio track at a time?
- 5 From which interface element in the Edit Page can you add a preset Fusion Title to your timeline?
 - A) The Inspector
 - B) Edit Index
 - C) Effects Library

Answers

- 1 False. All new projects are saved into the currently active database.
- 2 Bins are most commonly used to organize imported clips in DaVinci Resolve.
- 3 A and B. The Toolbar has buttons for performing Overwrite, Insert and Replace edits. Append at End edits can be performed using the Timeline Viewer overlays, the Edit > Append at End of Timeline menu option or by pressing Shift-F12.
- 4 False. You can add as many video and audio tracks as you require by choosing the Add Tracks option after right-clicking in the timeline track headers.
- 5 C. Preset Fusion Titles can be added from the Titles category of the Effects Library in the Edit Page.

Lesson 2

Managing Dailies and Edit Prep

While DaVinci Resolve 15 is a superior editing, audio mixing, visual effects, and color grading system, it can also play a key role on-set before a single edit is made. In this lesson, you'll focus on some of the incredibly powerful yet lesser-known, or often overlooked, Resolve functions that will help during production as you organize and optimize high-resolution, camera-original media, and generally prepare everything ready for your edit.

Time

This lesson takes approximately 60 minutes to complete.

Goals

Backing up Source Files	52
Customizing New Projects	57
Syncing Dailies	59
Modifying Clip Audio Channels	64
Configuring Metadata Presets	67
Saving Searches using Smart Bins	74
Creating Power Bins	76
Optimizing Clips for Editing	78
Lesson Review	83

Backing up Source Files

The most important asset of any project is the camera-original media. It is irreplaceable, and if corrupted in any way, the alternatives can be painful. So, it makes sense that the very first thing you must do is to back up that original media.

- 1 Open DaVinci Resolve and, in the Project manager, create a new project. Name your project **R15 Editing Lesson02 EditPrep**.

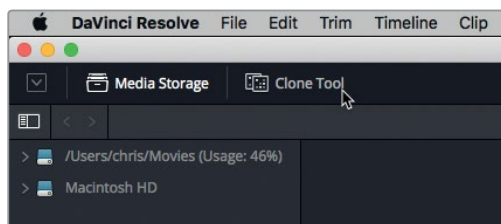
You'll use this empty project to back up content from disk image file which you will use to simulate plugging in a drive with new media. However, you could just as easily use a C-Fast or SD card from a camera.

NOTE To complete the next few steps in this exercise, you will need to have approximately 2.5 GB of available storage on your system.

- 2 Click the Media page button, or press Shift-2.

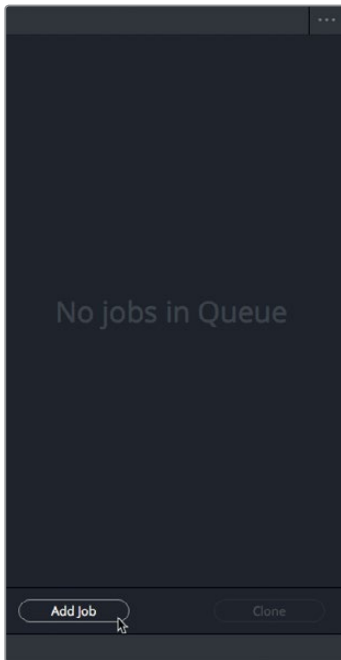
The Media page is the most efficient page for importing and organizing media, syncing clips, and adding metadata. It is also where you can back up camera-original media using the clone tool.

- 3 To display the clone tool, click the Clone tool button in the upper-left of the toolbar.



A new window opens between the Media storage browser and the viewer which you can use to create a backup of media cards, folders, or even an entire drive of content.

- 4 At the bottom of the Clone tool panel, click the Add Job button.



Each item you want to clone or back up is considered a job. You can add as many jobs as you like and then create clones of content all at once. You add content by dragging a folder, a disk image, or camera card content from the Media storage browser into the Clone tool panel.

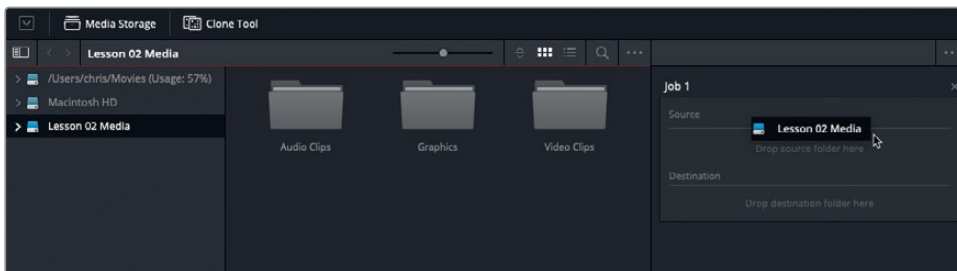
- 5 Open a new Finder window (macOS) or Explorer window (Windows), and navigate to R15 Editing 201 > Lessons > Lesson 02 Edit Prep. Double-click the **R15_Editing_Lesson02.iso** file to open it.

This ISO file is a disk image that will appear on your system as a virtual hard drive. You have just simulated plugging in an external source, such as a hard drive or camera media card.

- 6 Return to DaVinci Resolve.

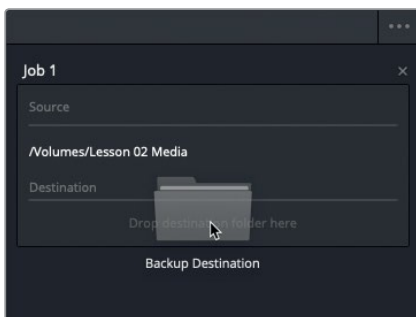
In the list of media storage locations, a new source called **Lesson02_Media** is now available.

- 7 Drag **Lesson02_Media** into the Clone tool panel's Source area.



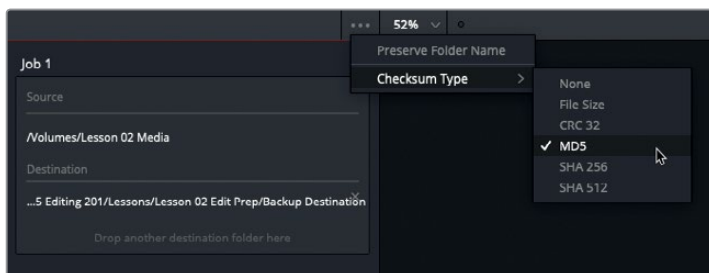
Each job requires at least one destination for the cloned media; however, you can add multiple destinations to create multiple backups at once.

- 8 In the Media storage browser, navigate to the “R15 Editing 201 > Lessons > Lesson 02 Edit Prep” folder, and drag the “Backup destination” folder into the Clone tool panel's Destination area.



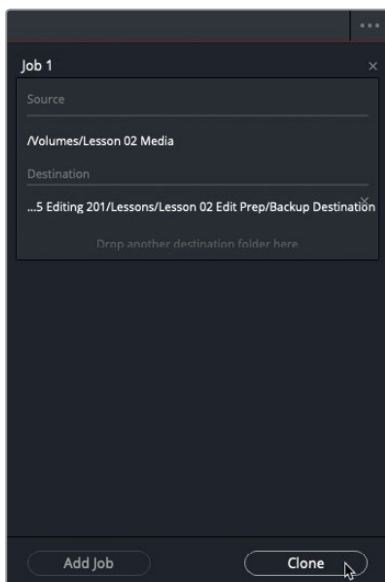
TIP You can also Right-click a folder in any media storage location, and choose “Set as Clone Source” or “Add as Clone Destinations”.

- 9 In the upper-right corner of the clone tool panel, in the options menu, choose Checksum Type > MD5.

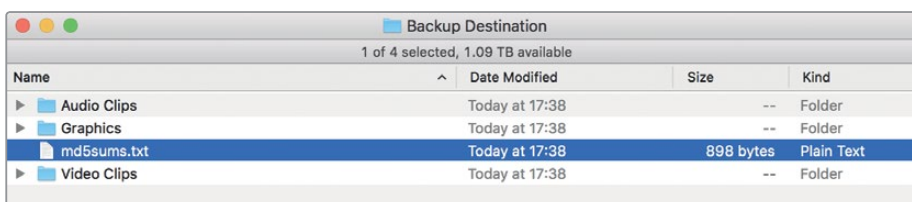


A checksum is a way to detect and prevent errors that can occur during the copy operation. Several checksum methods are available, but MD5 checksum has become the industry standard, and studios that require checksums with media offload on set will typically require it.

- 10 Click the Clone button at the bottom of the Clone tool panel to begin the backup. During this time, you can continue using Resolve.



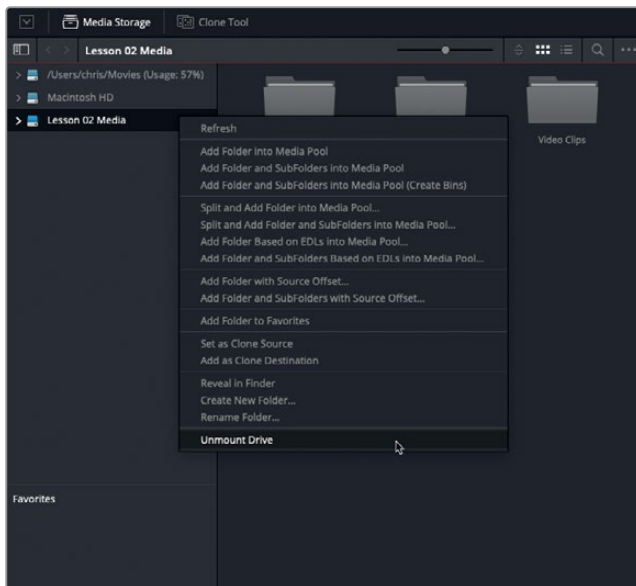
- 11 When the copy is complete, a green Complete label appears on the job in the Clone tool.
- 12 In your operating system's interface, navigate to the R15 Editing 201 > Lessons > Lesson 02 Edit Prep > Backup destination folder.



In addition to containing the entire contents of the disk image, the backup destination includes a MD5 checksum text document that reports any errors as a result of the checksum verification.

- 13 Return to Resolve, and in the toolbar, click the Clone tool button to close the panel.

- 14 In the Media storage locations, Right click the Lesson02_Media location, and choose Unmount Drive to unmount the drive from your system, thereby allowing it to be removed safely.



NOTE For Windows users, if the disk image does not unmount using the above method, you can always right-click the mounted disk image and choose “Eject”.

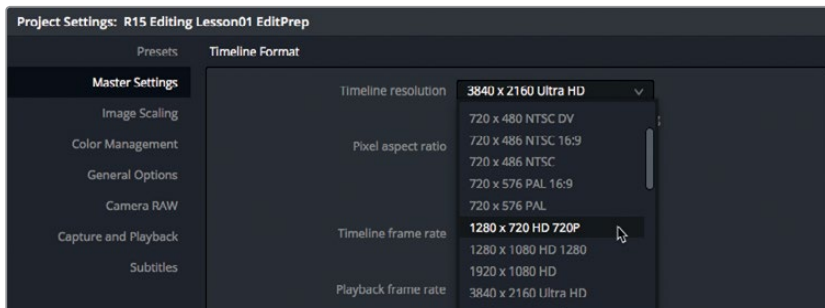
Cloning your camera-original content is so essential that it is worth putting DaVinci Resolve on set, so a backup can be performed even before the set is struck and everyone goes home. In so doing, you can clone and check the media; and if something is wrong, you will know to reshoot right away with the least impact on schedules and budgets.

Customizing New Projects

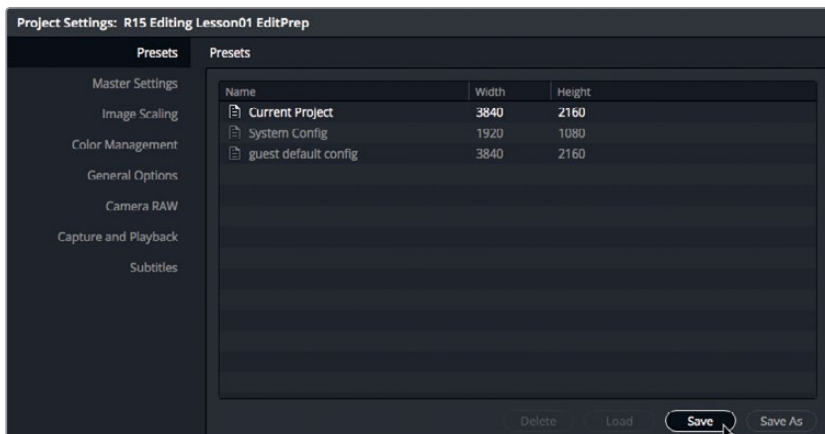
After you have backed up all your content, configuring the actual project that you want to work on can be made easier if you have created presets for the most common project types that you'll work on.

Rather than checking your project settings each time you open a project, you can configure options in the Project settings window and save those as your defaults. So, every time you open a new project under your user profile, DaVinci Resolve will default to those settings. Plus, you can also load these presets into existing projects.

- 1 Choose File > Project settings, or press Shift-9 to open the Project settings window.
- 2 In the Master settings, set the “Timeline resolution” to “1280 x 720 HD 720P”, and ensure that the “Timeline frame rate” is set to 24 frames per second.

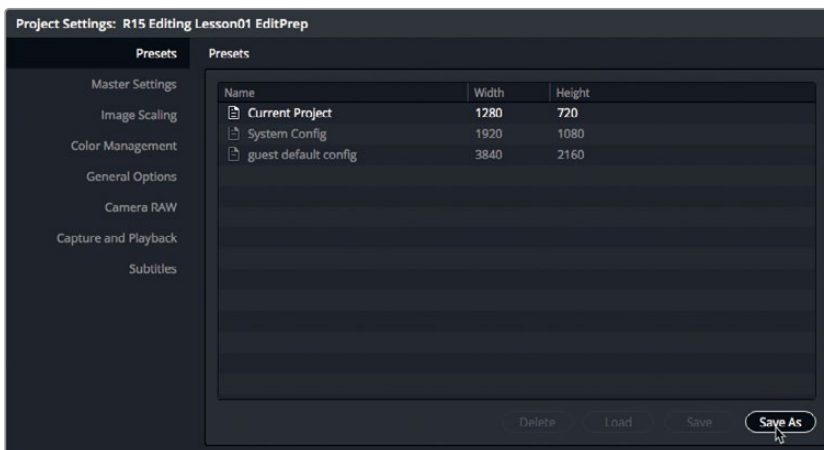


- 3 Click the Presets category.
- 4 In the Presets panel, click the Save button to save the current configuration.



The selected preset is always the Current Project, which means that only the open project will contain these settings. You also can save a preset to apply to other projects.

- 5 Select the “Current Project” preset you’ve just updated, and choose “Save as”. Enter the new preset name as **R15 Editing**, and click OK.



Your settings for this project are now saved. To quickly apply them to any project in this database, you can select the preset, and click “Load”.

If you want every new project to open using a specific configuration, you can save any preset into the guest default config setting.

- 6 Right-click the R15 Editing setting and choose Save as User Default config.



The preset is copied into the guest default config. Now, every new project you create will use those settings.

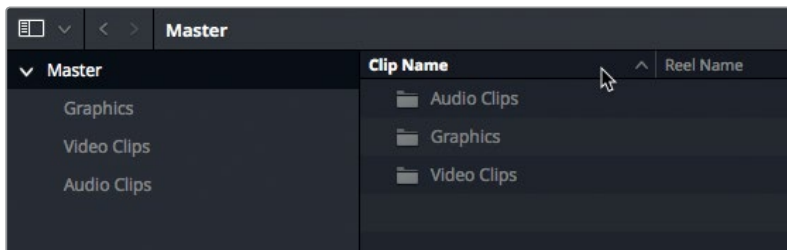
TIP You can also transfer settings from any project to the current project in the Project manager. To do so, press Shift-1 to open the Project manager, right-click any project, and choose “Load Project settings to Current Project”. A dialog box asks you to confirm replacing your current project’s settings. To do so, click “Load Project settings”.

Project presets allow you to easily create, manage, and switch between presets to enable the various project resolutions, frame rates, and other settings that you might need to work with. Project presets can save nearly every parameter and setting across all panels in the Project settings window; however, only the “guest default config” is used as the default for new projects.

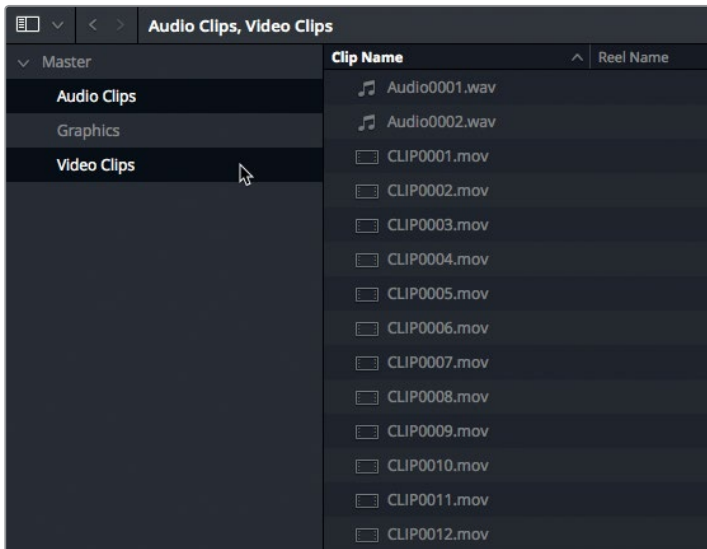
Syncing Dailies

Now you’ll import the dailies into your project and begin organizing the media by syncing any audio and video clips that were recorded on separate devices. Some productions record audio on dedicated digital audio devices to capture the highest quality audio, or when it’s not practical or desirable to record audio directly to a camera. When the files come in from the day’s shoot, you’ll need to sync the separate audio and video clips. In some cases, you can auto sync these using timecodes found on both clips, or by comparing camera-recorded audio with the separate audio clips. In some instances, you may not be so lucky and you will need to manually sync your clips.

- 1 In the Media storage browser, navigate to R15 Editing 201 > Lessons > Lesson 02 Edit Prep > Backup destination.
This was the destination location you set in the Clone tool when copying the disk image in the previous exercise.
- 2 Select all three folders. Right-click any of the folders, and choose “Add folder and SubFolders into Media pool (Create Bins)”.
- 3 In the Media pool, switch to list view, and click the Clip name header to sort the bin in ascending order. (The arrow will point up.)



- 4 In the bin list, click the Video clips bin, and then Cmd-click (macOS) or Ctrl-click (Windows) the Audio Clips bin to display the contents of both bins in the Media pool.



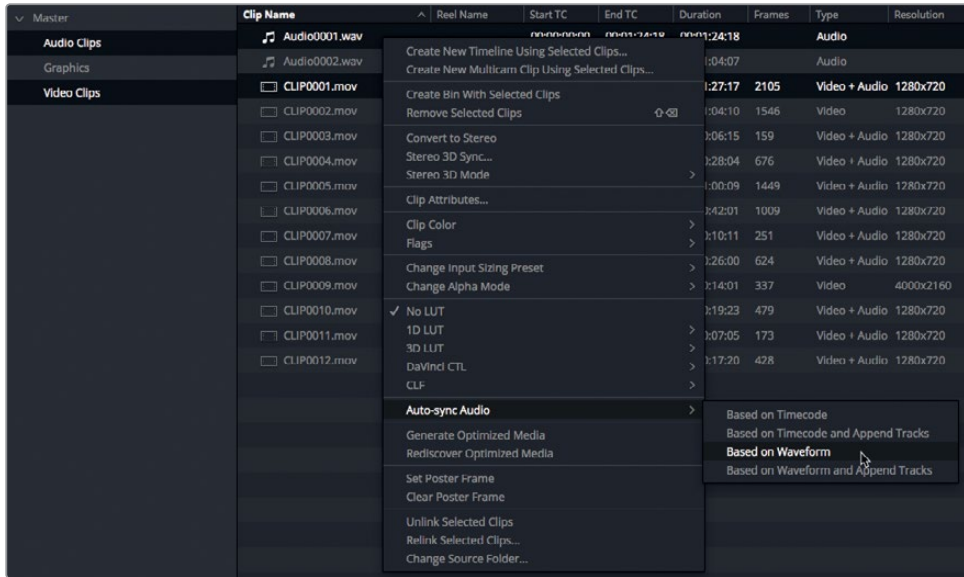
- 5 Double-click **CLIP0001.mov**.



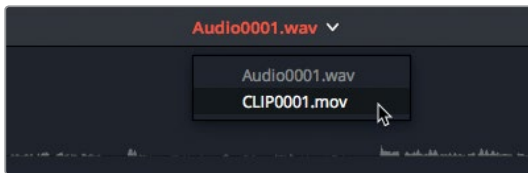
Play through the interview with Sasha in the viewer.

This clip has poor audio, possibly because it was recorded using the on-camera microphone.

- 6 Double-click **Audio0001.wav**, and play through this clip in the viewer.
This clip contains the correct audio for Sasha's interview.
- 7 In the Media pool, select **CLIP0001.mov** and **Audio0001.wav**, right-click either file, and choose Auto-sync Audio > Based on Waveform.



- 8 From the recent clips pop-up menu at the top of the viewer, choose **CLIP0001.mov**, and play it to hear the newly synchronized picture and sound.



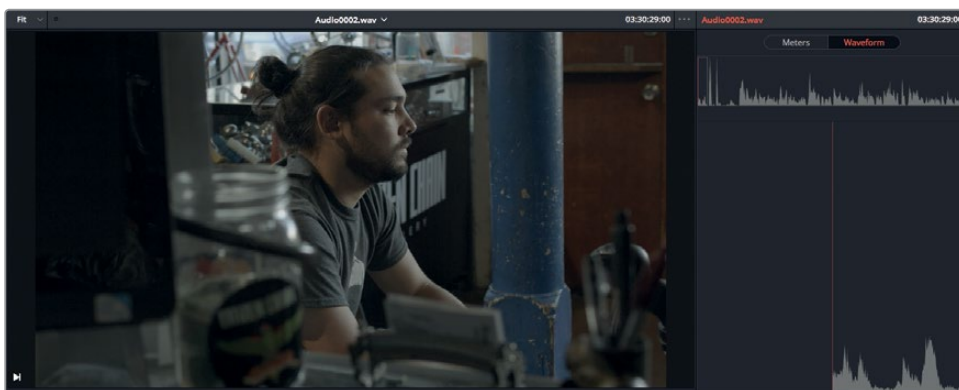
TIP If you have many clips to sync in this manner, you can select multiple audio and video clips, right-click one of them, and choose Auto-sync Audio > Based on Waveform to let Resolve work its magic and sync them all automatically.

Resolve automatically matches the waveforms of the two pieces of audio to correctly sync the production audio with the video clip.

Syncing Manually

The previous example worked well, but sometimes automatic operations don't work as smoothly.

- 1 Double-click **CLIP0002.mov** to open it in the viewer, and play through the clip. Because no audio was recorded with this clip, you have no audio waveform with which to auto-sync the clip.
- 2 In the Audio panel, click the Waveform tab to prepare to display the audio waveform of a selected clip.
- 3 In the Media pool, select **Audio0002.wav**. The waveform viewer will update to show the audio waveform of this clip.



You will need to manually sync these two clips. To do so, you need to position the playheads for the video clip and the audio clip where you think the clips align.

- 4 In the viewer, drag the jog bar through the clip until you see Sasha clap his hands.
- 5 Press the Left and right arrow keys to position the playhead on the exact frame where his hands are together at 03:30:31:19.

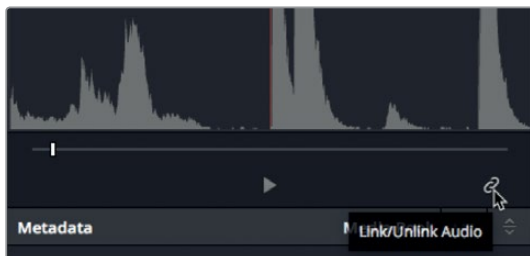


- 6 In the Audio panel, drag the jog bar until you see the first waveform peak that indicates the hand clap at 03:30:31:17.
- 7 Press the Left and right arrow keys to position the audio panel playhead on the audio peak of the hand clap.



TIP Audio scrubbing is a useful feature when trying to identify a particular location on an audio clip. Choose Timeline > Audio Scrubbing, or press Shift-S, to toggle it on and off.

- At the bottom of the audio panel, click the Link/Unlink Audio button.



The transport controls beneath the audio window disappear; and the clips are now linked. Let's make sure that the sound and picture are lined up correctly.

- Move the playhead to the beginning of **CLIP0002.mov**, and click play to verify the picture and sound are in sync.

TIP If you're not entirely happy with your results, clicking the Link/Unlink Audio button again will unlink the clips and allow you to readjust the sync relationship all.

While it is much easier to use Resolve's auto sync feature to sync clips based on their timecodes or audio waveforms, being able to manually sync clips is also useful if the audio has a transient audio signal that you can visually locate in the video. That's why most dual-system setups use clapperboards to help in this process.

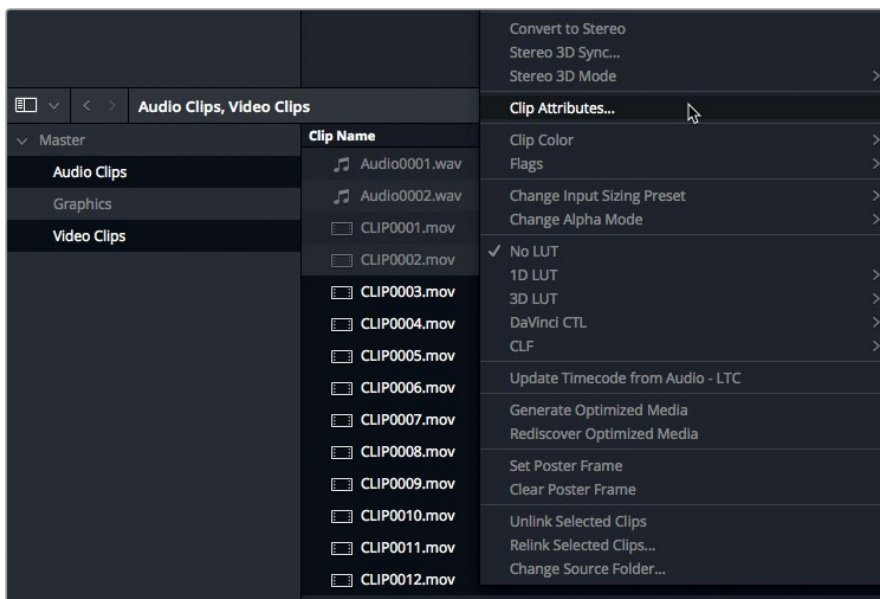
Modifying Clip Audio Channels

The next step in your edit prep process is to ensure that the audio in the project is configured correctly. You can do that in the Clip attributes window.

- In the Media pool, click the **CLIP0003.mov** clip to select it.
- Shift-click **CLIP0012.mov** to also select it and all the video clips in-between.

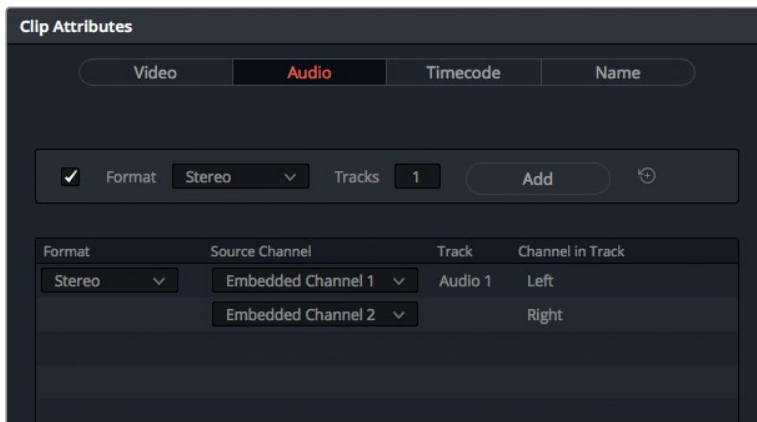
Even though one clip doesn't have audio, you can simultaneously modify those clips that do have audio in the Clip attributes window.

- 3 Right-click any of the selected clips, and choose Clip attributes.



In the Clip attributes window, you can configure various aspects of how clips are displayed, played, and heard.

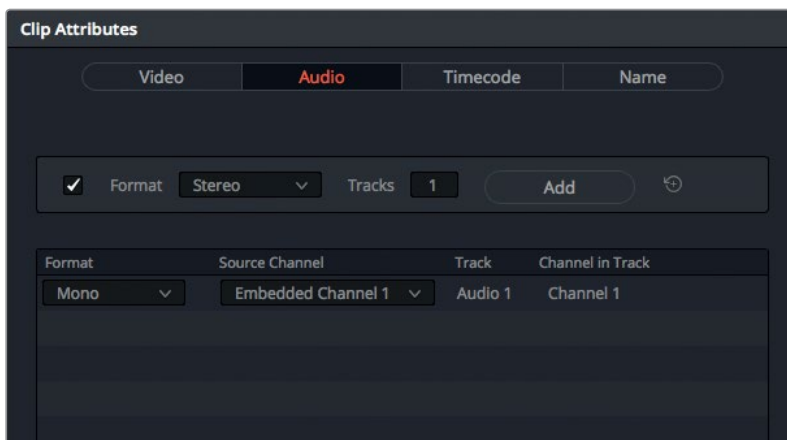
- 4 Click the Audio tab.



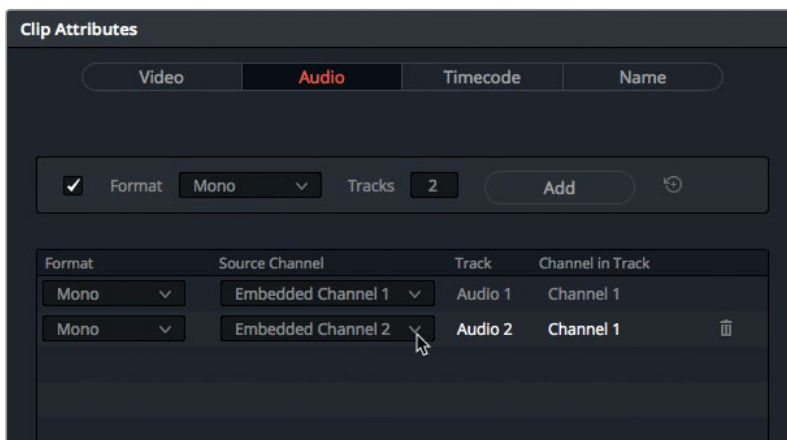
In the Audio tab, you may change the number of tracks used when editing the clip into the timeline, the configuration of the individual channels within those tracks and whether those channels are used or muted. In this case, you're working with stereo clips; but because this audio was recorded in-camera, it makes sense to configure these as mono clips.

NOTE You can individually configure multiple tracks with different configurations for each clip, depending on the audio formats supplied to you and how clips will be used throughout the edit.

- 5 In the Format column pop-up menu, choose Mono to reconfigure the current audio track as mono, and set the Source channel to Embedded Channel 1.



- 6 In the uppermost Format pop-up menu, choose Mono. Click Add to insert another mono track, and change its Source channel to Embedded Channel 2.



- 7 Click OK to save the setting and close the window.
These clips are all now correctly configured with two tracks of mono audio.

TIP To remove an audio track and its configuration from any clip, move your mouse pointer over the track, and click the trash can icon that appears to the right.

Clip attributes encompass several useful configuration features, but you'll want to configure most of them before you edit a clip into a timeline. Once clips are placed into a timeline, any changes you make to the clips attributes in the Media pool will affect only new edits. Existing edits in any timeline conform to the clip attributes in place at the time the edit was made. You can adjust these within the timeline by right-clicking the clip, and choosing Clip attributes.

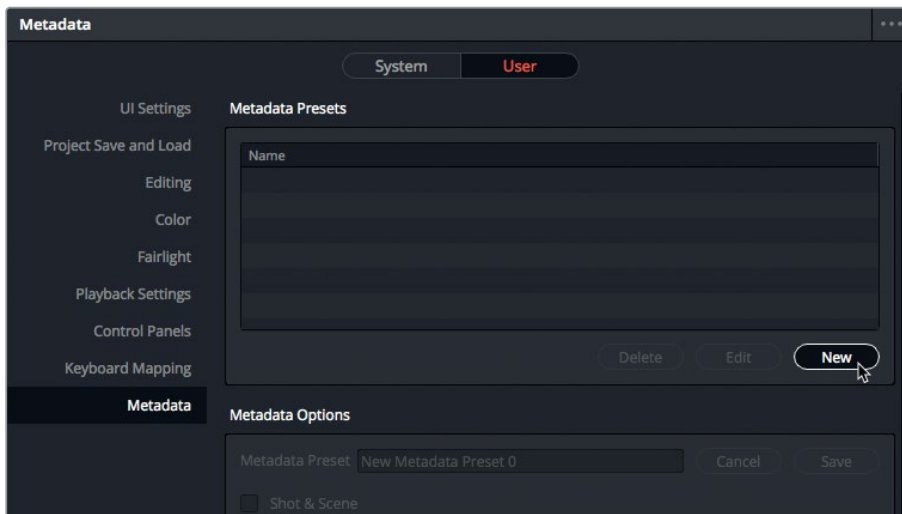
Configuring Metadata Presets

As useful as metadata is, it can become overwhelming. Resolve has several metadata categories you can use to reduce metadata to a manageable subset of the whole. However, you can customize metadata presets to display only the information you most need or want to see.

- 1 Choose DaVinci Resolve > Preferences, or press Cmd-, (comma) in macOS or ctrl-, (comma) in Windows.
- 2 In the preferences window, click the User tab, and select the Metadata category to the left.

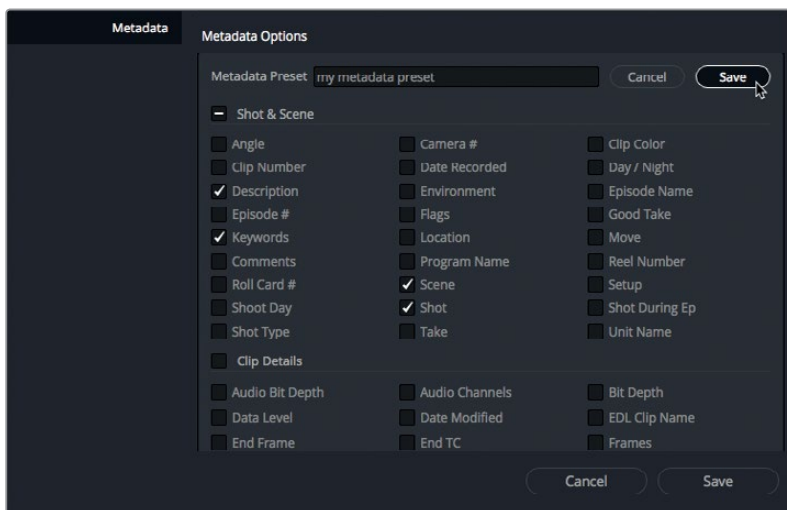
In the Metadata presets pane, you can create, modify, and delete custom metadata presets.

- 3 Click the New button to create a new metadata preset, and name it **my metadata preset**. Click OK.

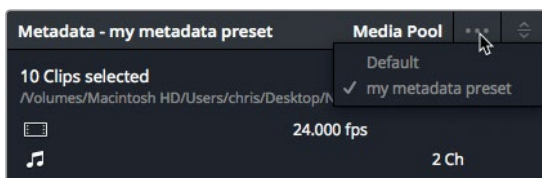


In the lower-half of the Metadata pane, under Metadata options, you'll see all the metadata you might add to the preset.

- 4 Select the checkboxes for Description, Keywords, Scene, and Shot.
- 5 At the upper-right of the Metadata options, click Save to save your changes to the preset.



- 6 Click Save at the bottom of the preferences window to save and close the preferences panel.
- 7 In the Media pool, select one or more clips; and if necessary, click the Metadata button to open the Metadata editor to the right of the interface.
- 8 Click the options menu, and choose the new “my metadata preset”. Click the sort menu, and choose All Groups.



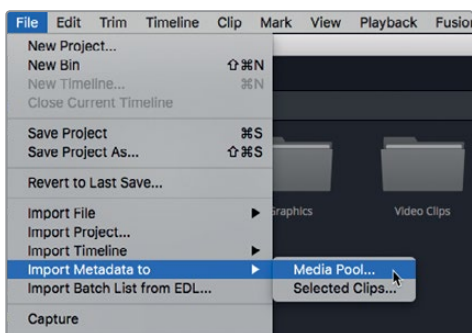
TIP Your preset will appear blank in the Metadata editor unless it is first set to show all groups or a subset that contains all the fields of your preset.

Using this preset, fields for the four selected metadata items appear in the metadata editor. Currently, the fields are empty for all the clips in the Media pool; you could enter this information manually, or if the information exists outside of DaVinci Resolve, you could import it.

Importing Metadata

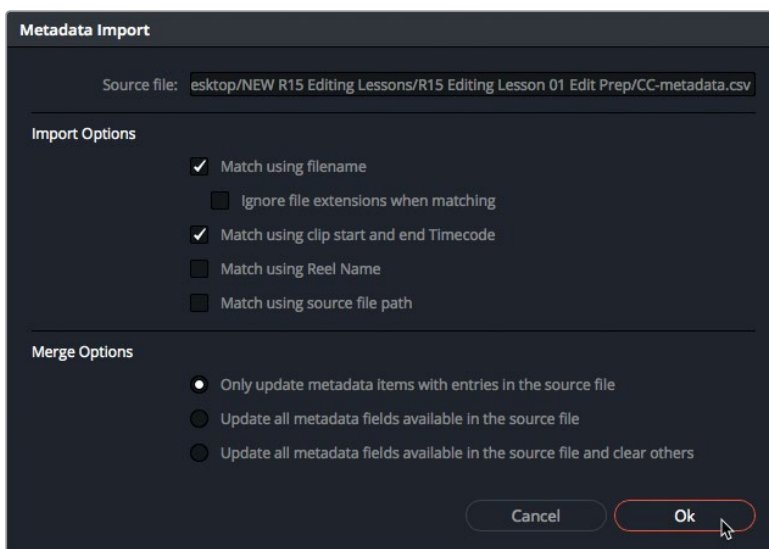
You have many ways to populate your clips with metadata. Some may be entered on the camera during production, although metadata is rarely a priority for the camera operator or an assistant. You can enter it manually, which very few people want (or have the time) to do. Or, you can assign someone on set to be responsible for entering metadata in a simple CSV (comma-separated values) format. Many smart slate apps now store metadata such as shot, scene take, and more. You can then import that data into Resolve using the CSV format and save yourself hours of work in the cutting room.

- 1 Choose File > Import Metadata to > Media pool.



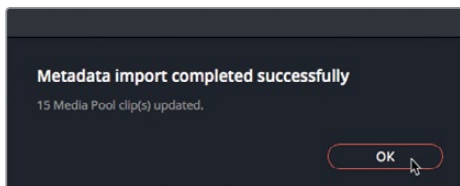
- 2 In the file dialog, navigate to R15 Editing 201 > Lessons > Lesson 02 Edit Prep. Select **CC-metadata.csv**, and click Open.

The Metadata Import dialog allows you to choose how you want Resolve to match the clips with additional metadata. In this case, you can match clips based on their file names and timecodes.



- 3 Deselect the “Match using clip start and end Timecode” box.
- 4 Click OK to import the metadata.

The metadata is imported and added to the clips based on matching file names.



- 5 Verify the added information by clicking a few of the clips and viewing their metadata in the Metadata editor.

Your clips now include scene, shot, description and keyword information. This metadata will help as you organize and rename the clips to something more useful than the cryptic file names given to them by the camera.

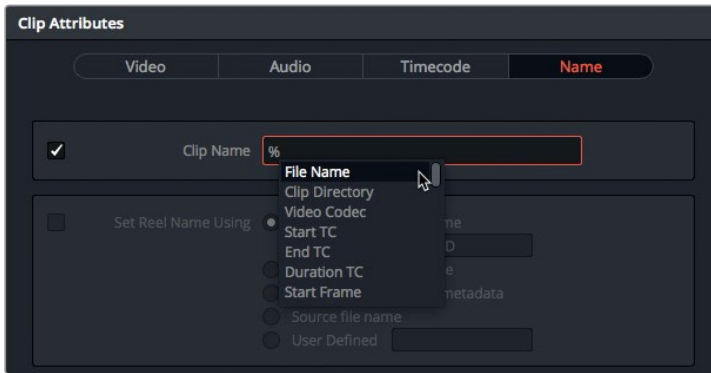
Renaming Clips with Metadata

Clip names from a camera, or almost any capture device, are often an alphanumeric string that typically includes the date and time that the clip was made. They are not always the most descriptive names and often need to be changed for editing purposes. Entering clip names manually is one way to address this, but it is not the only way (or even the more efficient way) to rename them.

Variables are references to other metadata that exist on the clip such as scene, take, and shot number—so-called because variables are not the same for each clip. You can enter a variable into the clip name and Resolve will reference the correct information for each clip (provided the information is present). For example, you can use the metadata you’ve just entered to change the generic names of the clips in your Video clips bin to more descriptive names.

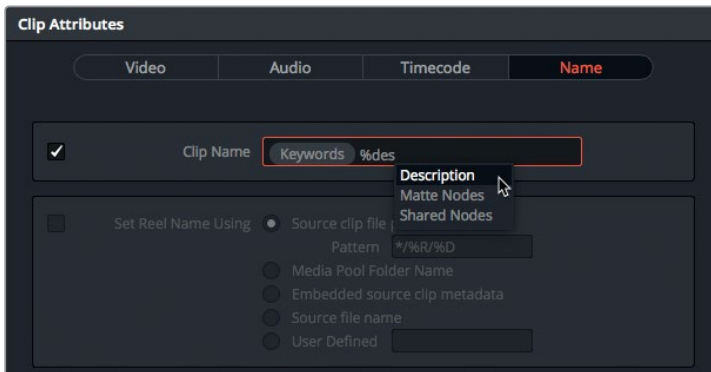
- 1 Select the Video clips bin, and press Cmd-A (macOS) or Ctrl-A (Windows) to select all the video clips in the bin.
- 2 Right-click any of the selected clips and choose Clip attributes.
- 3 In the Clip attributes window, select the Name tab.

- 4 In the Clip name field, type a % (percentage sign).



Entering % indicates that you are about to enter a variable. When you enter that %, a list of variables appears.

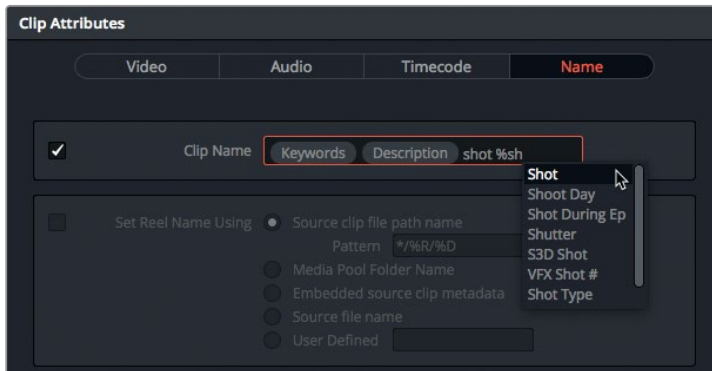
- 5 Press K to begin typing, and enter **key**, to see all of the variables that start with a “k”.
- 6 In the pop-up menu, click Keyword to add it to the Clip name field.
- 7 Press the spacebar to add a space after this variable. Type **%des** and choose Description.



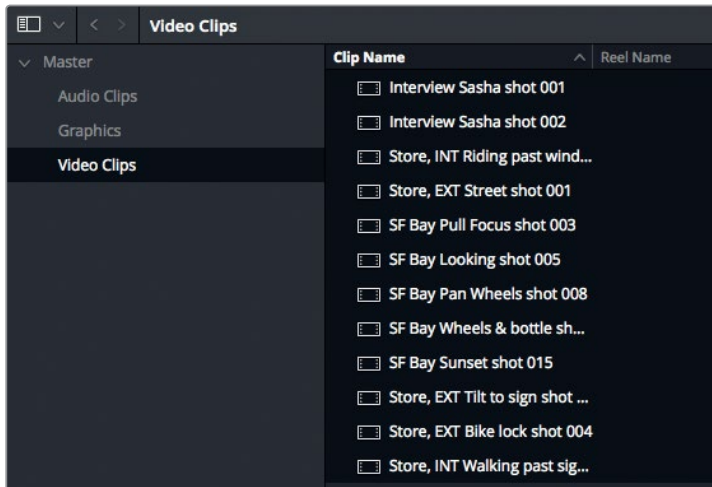
You can combine text that you enter with preset variables to create a more descriptive clip name. For instance, you can type a space to separate each variable, and add the word “shot” before each shot number.

- 8 Enter a space after the description variable, type **shot**, and enter another space.

- 9 Type **%sh** to display all the variables with an “sh,” and in the pop-up menu, choose **Shot** to add it into the Clip name field.



- 10 Click OK to close the window, and apply the clip name variables.



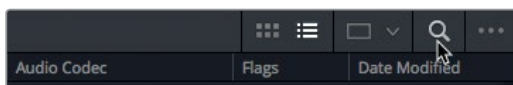
The clip names now show a combination of the keywords, descriptions and shot numbers for each clip.

If you have the metadata attached to your clips, you should use it. Naming clips with variables can save hours of manual typing and provide clear, descriptive names that you can match with other documents in a production like camera logs and script notes.

Searching with Metadata

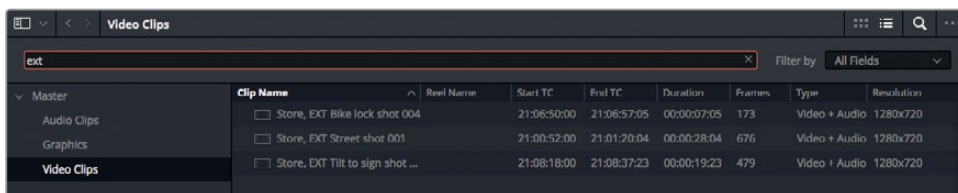
You also can use this metadata to find clips quickly and easily. Being able to find the material you want or need as rapidly as possible means you can more effectively focus on the story and the flow of your edit.

- 1 Select the Video clips bin.
- 2 At the top of the Media pool, click the magnifying glass button to reveal the search field.

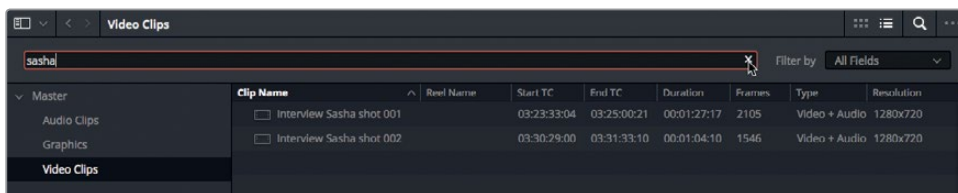


By default, the search criteria for the selected bin is set to search across a clip's file name.

- 3 In the "Filter by" pop-up to the right of the search field, choose All fields. Resolve will search across all the available metadata fields.
- 4 In the search bar, enter **ext** to display all the exterior shots that have EXT as a keyword.



- 5 In the search bar, highlight ext, and enter **Sasha** to reveal the two shots that have Sasha entered into their description fields.
- 6 Clear the search bar by clicking the x to the right to return to the full list of media in the Video clips bin.

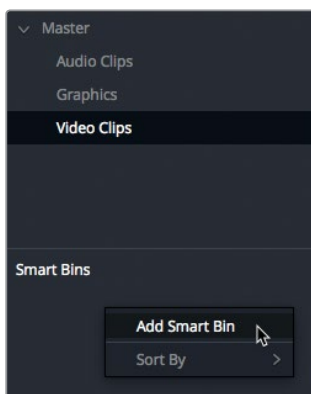


Resolve's powerful and responsive search feature lets you leverage the flexibility of metadata to easily find Media pool clips in even the largest project.

Saving Searches using Smart Bins

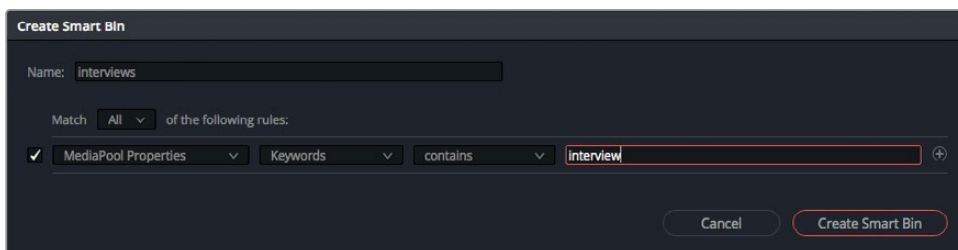
You're probably already familiar with using bins in DaVinci Resolve to store and organize your media. However, Smart Bins provide a clever way to automatically filter your media based on various rules that you define. They can be a powerful way to quickly organize an entire project.

- 1 In the Smart Bins area of the Media pool, right-click and choose Add Smart Bin.



The Create Smart Bin window appears.

- 2 Enter **Interviews** as the name of this Smart Bin.
- 3 Click the File Name option, press K, and choose Keywords.
- 4 In the field to the right of the window, type **interview**.

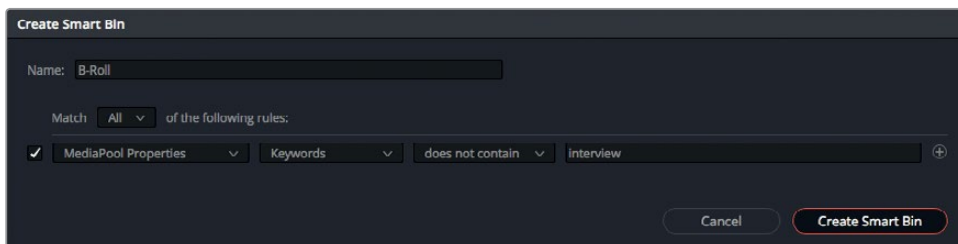


- 5 Click Create Smart Bin.

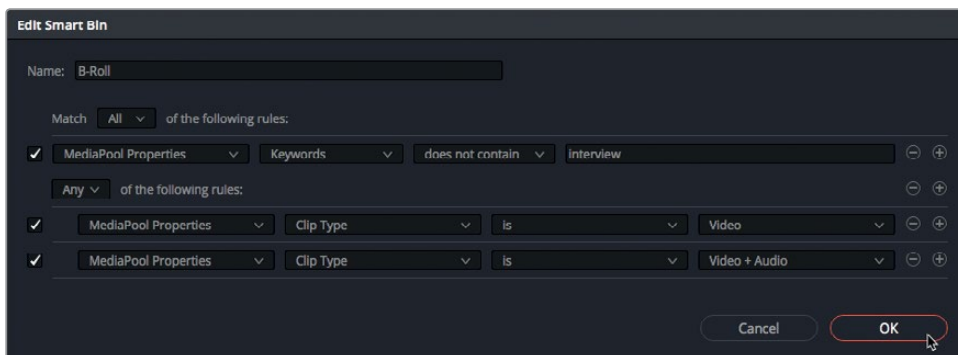
This Smart Bin contains only media that has “interview” in the keywords metadata fields. If you were to add this keyword to any other clip, it would also automatically appear in this Smart Bin.

- 6 Right-click in your list of Smart Bins, and choose Add Smart Bin.
- 7 Name this Smart Bin **B-Roll**.

- 8 Choose Media pool Properties, Keywords, and “does not contain”, and in the final field, enter **interview**.



- 9 Option-click (macOS) or Alt-click (Windows) the + (plus sign) button to add another set of criteria.
- 10 Change the All pop-up on this new set of rules to Any.
- 11 Click the Keywords pop-up menu, and press C to move to Clip name. Press C again to move to Clip Type, and choose Clip Type.
- 12 In the final pop-up menu, choose “Video”.
- 13 Click the + (plus sign) button, and choose “Video+Audio” in the final pop-up menu.

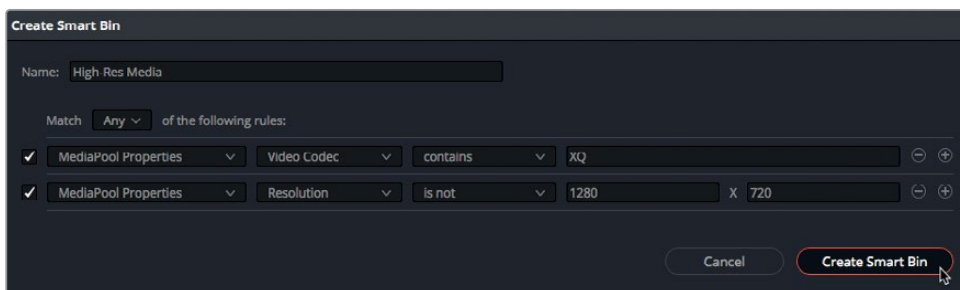


- 14 Click Create Smart Bin to save this Smart Bin with its rules.

This Smart Bin now contains any clip without the “Interview” keyword, but only if it is a clip that contains just video, or a clip that contains video and audio, thereby excluding clip types such as timelines, compound clips, or multicam clips from finding their way into this Smart Bin.

Finally, you may need to create a Smart Bin for media based on a resolution, codec or framerate.

- 15 Right-click in your Smart Bins list, and choose Add Smart Bin.
- 16 Name this Smart Bin **Misc Media**.
- 17 Change the second pop-up menu to Resolution. (You can repeatedly press R to cycle through the metadata that begins with the letter R.) Set the third pop-up menu to “is not”, and the next two fields to 1280 x 720.



18 Click Create Smart Bin.

This Smart Bin collects the two pieces of media in this project that have a video resolution other than 720p.

TIP To change the rules of any current Smart Bin, right-click the Smart Bin, and choose “Edit Smart Bin”.

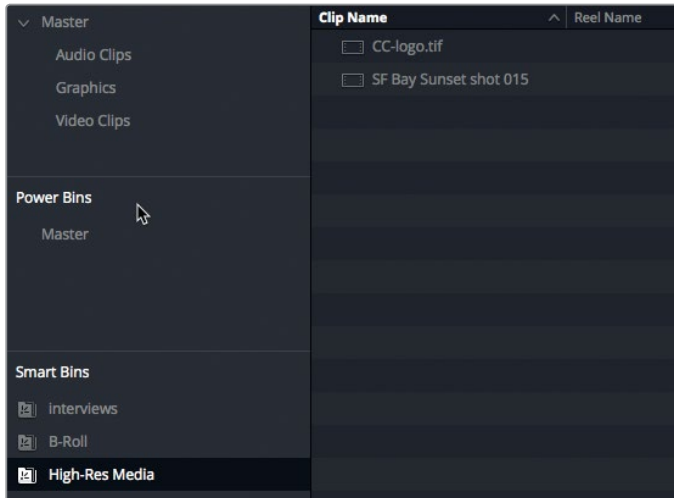
As you can see, coupled with the power of metadata, Resolve has some flexible and detailed searching functions; so, you should always be confident you’ll be able to find your media. One word of caution, however, is that a search is only as good as the quality of the available metadata. Sometimes a simple spelling mistake can thwart all of a search engine’s benefits.

Creating Power Bins

Bins and Smart Bins are great organizational tools to use within a project. The Power Bin is a third bin type that can assist you with organization. Unlike regular bins or Smart Bins which exist only within the current project, Power Bins appear in every project you create within a database. They are useful for storing elements you want to reuse across multiple projects such as graphics, titles, sound effects or music files.

1 Choose View > Show Power Bins.

Power Bins are displayed in the Media pool above the Smart Bins.



- 2 Select the Power Bin's Master bin, and press Shift-Command-N (macOS) or Shift-Ctrl-N (Windows) to add a new Power Bin. Name the bin **Logo**.
- 3 Select the Graphics bin that's currently in your project. This bin contains a file called **CC-logo.tif**.
- 4 Drag **CC-logo.tif** to the Logo Power Bin.



Because Power Bins appear in every project you create, this image file will be available for any project you have in your current database.

NOTE Multicam, Compound Clips, Fusion Clips or Timelines cannot be placed in Power Bins.

The next time you find yourself with a series of projects that share elements such as sound effects, graphics, or common video elements, Power Bins can be a powerful tool to save you time copying clips into different projects.

Optimizing Clips for Editing

One of the last steps you might choose to do before you begin editing in earnest is to consider optimizing high-resolution media. Working with camera-original content is ideal when color grading but it can slow you down if it over-taxes the hardware you're working on. As you are trying out different shots, trimming and adjusting clips, you need a proper feel for the pacing of a scene and the changes you're making. A computer that isn't able to process media efficiently at its current resolution can result in a frustrating editing experience.

If you plan to edit and color grade on the same computer, Resolve includes a convenient method for creating lower-resolution clips while retaining a relationship with the camera originals. Generating optimized media enables the speed you want when editing, yet leaves you only one click away from the camera-original media when you need it for color grading.

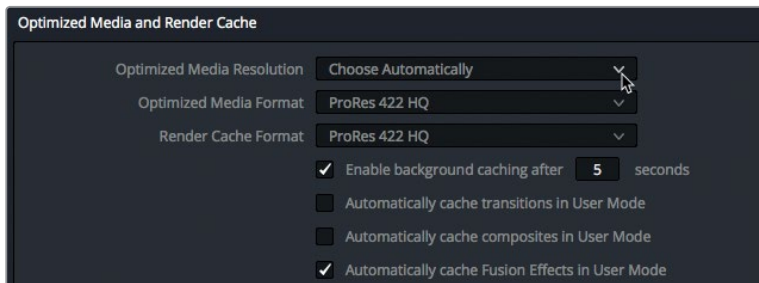
- 1 In the Misc Media Smart Bin, select **SF Bay Sunset Shot 15**.

Clip Name	Reel Name	Start TC	End TC	Duration	Frames	Type	Resolution	FPS
CC-logo.tif		00:00:00:00	00:00:00:01	00:00:00:01	1	Still	512x512	24.000
SF Bay Sunset shot 015		19:17:16:10	19:17:30:11	00:00:14:01	337	Video	4000x2160	24.000

This clip is at 4000 x 2160 resolution and uses the Apple ProRes 4444 XQ codec. It is considerably larger than the other clips, and may therefore slow down your computer as you edit. You'd be well advised to generate optimized media for this clip. Before you do so, however you'll want to configure the resolution and codec to be used to create the optimized file.

- 2 Choose File > Project settings, or press Shift-9, and choose the Master settings category.

The Optimized Media and Render Cache area of the Master settings pane includes options for selecting the resolution and compression codec of the optimized media.



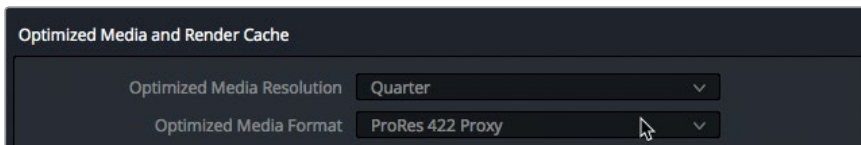
- 3 Click the Optimized Media resolution pop-up menu to view its options.

You can choose to scale down the clip by a specific percentage or allow the automatic setting to make the decision for you. "Choose Automatically" scales down only those clips that are larger than the timeline resolution. Such clips are scaled down to the current timeline resolution or as closely as possible to the original resolution. Clips at the timeline resolution or lower are not scaled.

4 Choose Quarter.

Using this setting will create an optimized version of this file that is 1000 x 540 resolution.

5 In the Optimized Media format pop-up menu, choose ProRes 422 Proxy (macOS) or DNxHR LB (Windows).

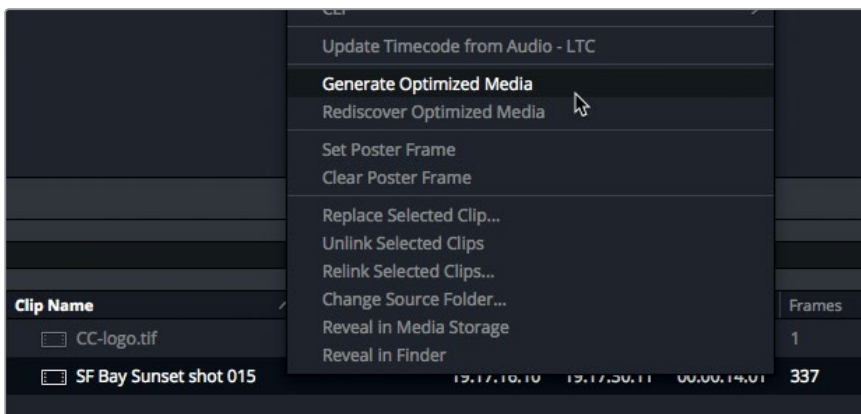


These two compression formats are low bandwidth, so they will provide better performance as you edit.

Now you can return to the Media pool and generate optimized media for the clip.

6 Click Save to close the Project settings window.

7 With **SF Bay Sunset shot 015** still selected, right-click the clip, and choose Generate Optimized Media.



The creation of the optimized file begins and a progress bar indicates how long it will take to process the clip. Once finished, the new media is stored on your cache disk in the first location set in the Media storage Panel of the System Preferences.

Identifying Optimized Media

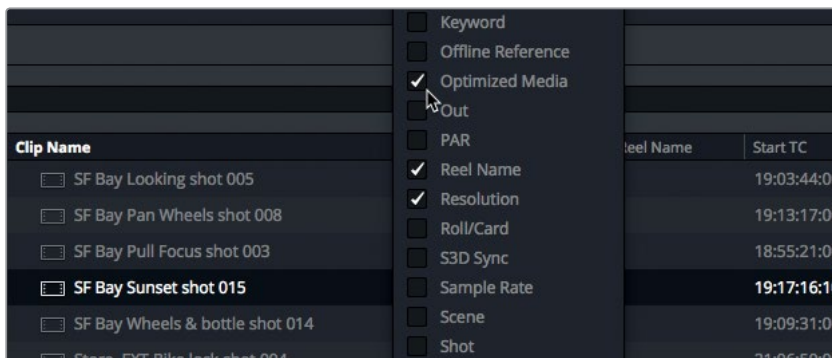
With a simple project such as you have here, it is easy to remember which clips you have optimized and which you haven't. However, in a real-world project with dozens of bins and hundreds of clips, you'll need a way to quickly identify optimized clips.

- 1 Select the B-Roll Smart Bin. Review the columns of the Video clips bin, and locate the resolution and codec columns.

For this optimized clip, the columns still display the camera-original resolution and codec. Remember, the optimized media did not replace the camera-original files. They still exist on your hard drive and are linked to these clips. So, Resolve continues to display the camera-original parameters.

TIP To delete optimized media for an entire project, choose Playback > Delete Optimized Media.

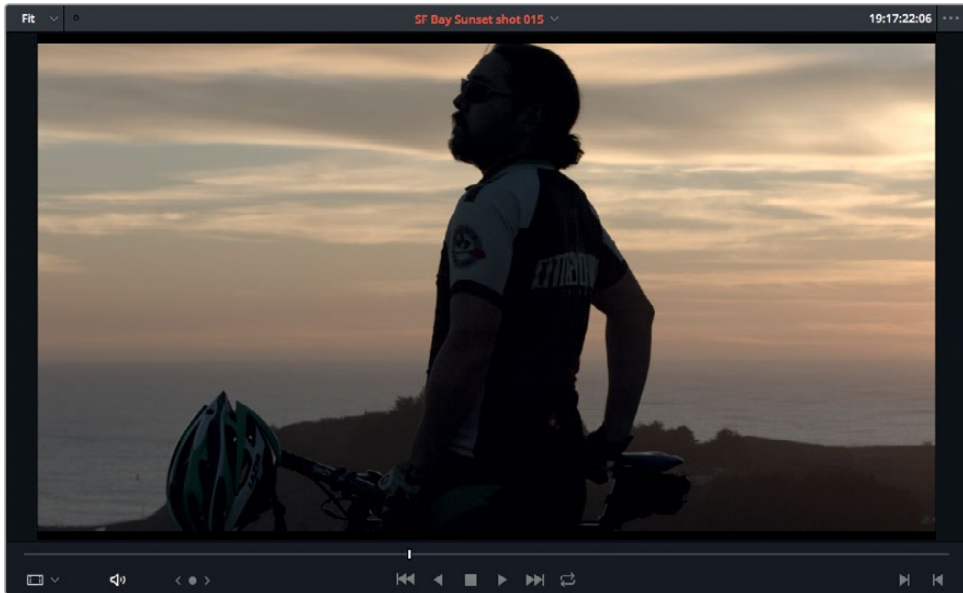
- 2 Right-click any column heading in the bin, and in the list of column options, choose Optimized Media.



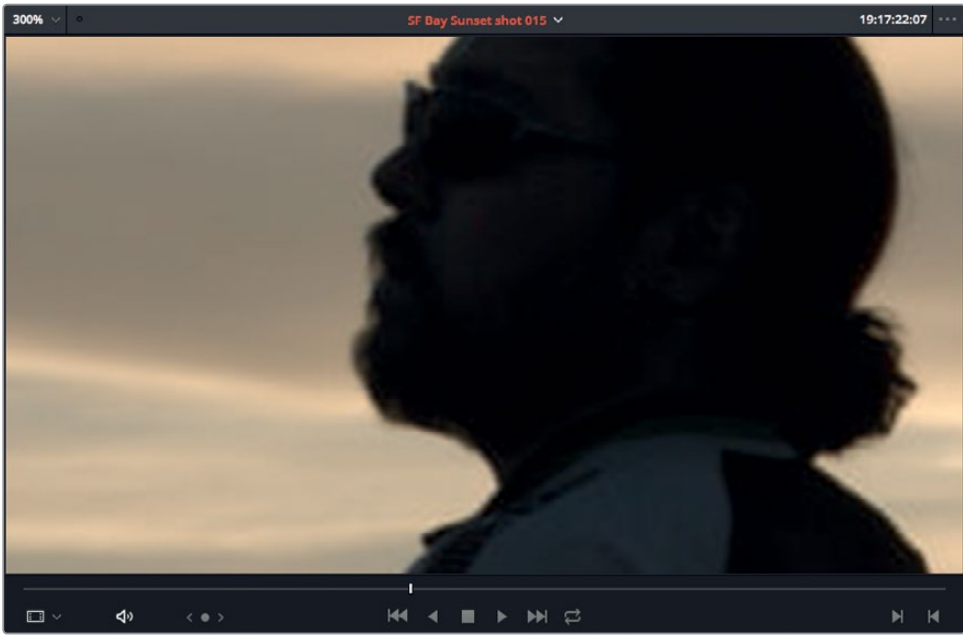
The Optimized Media column displays None in the columns of clips that have no optimized media, whereas it displays the optimized resolution for clips that have been optimized.

Clip Name	Optimized Media	Reel Name	Start TC
SF Bay Looking shot 005	None		19:03:44:00
SF Bay Pan Wheels shot 008	None		19:13:17:00
SF Bay Pull Focus shot 003	None		18:55:21:00
SF Bay Sunset shot 015	Quarter Res.		19:17:16:10
SF Bay Wheels & bottle shot 014	None		19:09:31:00
Store, EXT Bike lock shot 004	None		21:06:50:00
Store, EXT Street shot 001	None		21:00:52:00

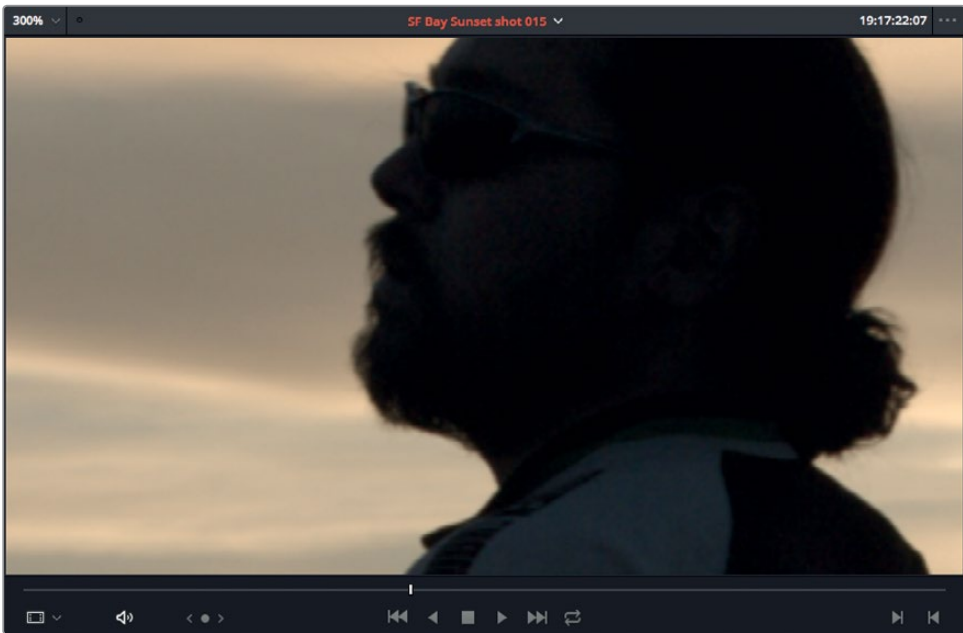
- 3 Double click the **SF Bay Sunset shot 015** clip to load it into the viewer.
You can easily switch between the optimized media and the original files in the playback menu.
- 4 Place the playhead near the middle of this clip so you can see a silhouetted profile of the cyclist.



- 5 Use your mouse scroll wheel to zoom in on the image to around 300%, or in the upper-left corner of the viewer, click the magnification pop-up menu, and choose 300%.
- 6 Hold down your middle mouse button and drag to reposition the image in the viewer until you can see the edge of the cyclist's silhouette against the brighter background.



- 7 Choose Playback > Use Optimized Media If Available to deselect the option.



You should notice the compression artefacts disappear around the edges of the cyclist when you switch between the optimized media and the original clip. Let's switch back to observe how the clip appears less sharp.

- 8 Choose Playback > Use Optimized Media If Available.
- 9 In the magnification pop-up menu, choose Fit to return to viewing the entire frame in the viewer.

DaVinci Resolve displays one of the two files based on the menu choice. Choosing Optimized Media will help you work faster during the edit because Resolve won't have to process the full image resolution, but you can quickly and freely switch to the high-resolution image for grading or other purposes.

Each project starts with a phase of importing and organizing footage. The features covered in this lesson highlight how DaVinci Resolve can benefit your post-production workflow before you even step into the cutting room.

Now you've seen some of the organizational aspects of working with Resolve, let's look at some of the more advanced techniques you can employ during editing.

Lesson Review

- 1 When using the clone tool, what is the default checksum type?
 - A) None
 - B) SHA 512
 - C) MD5
- 2 True or False? You can save a preset of your current project settings for future project configuration.
- 3 What methods can you use to auto sync sound to video files in the Media page?
 - A) Waveform
 - B) Timecode
 - C) Markers
- 4 Which type of bin can you access across different projects in the same database?
 - A) Smart Bins
 - B) Super Bins
 - C) Power Bins
- 5 True or False? Optimized media replaces your original media files.

Answers

- 1 C. MD5.
- 2 True. Project presets are saved in the Presets panel of the Project settings.
- 3 A. Waveform, and b. Timecode.
- 4 C. Power Bins.
- 5 False. Optimized Media is generated and stored in the first location set in the Media storage panel in DaVinci Resolve > Preferences, and is used when Playback > Use Optimized Media if Available is enabled.

Lesson 3

Cutting a Dialogue Scene

Editing a dialogue scene is often done by establishing the location and cutting between shots as they would play out in real time. Commonly known as continuity editing, this technique is centered around cutting between two (or more) shots, alternating back-and-forth to each character as their dialogue and reactions warrant. In this lesson, you'll apply this continuity technique to a scripted scene. You'll start with one of the most firmly established conventions in cinema—the shot/reverse-shot—and see how DaVinci Resolve 15's editing, match framing, and trimming tools can speed up this classic editing style.

Time

This lesson takes approximately 60 minutes to complete.

Goals

Selecting your Best Takes	86
Editing with Continuity	92
Match Frame with an Offset	96
Going Beyond the Straight Cut	99
Auditioning Multiple Takes	106
Lesson Review	111

Selecting your Best Takes

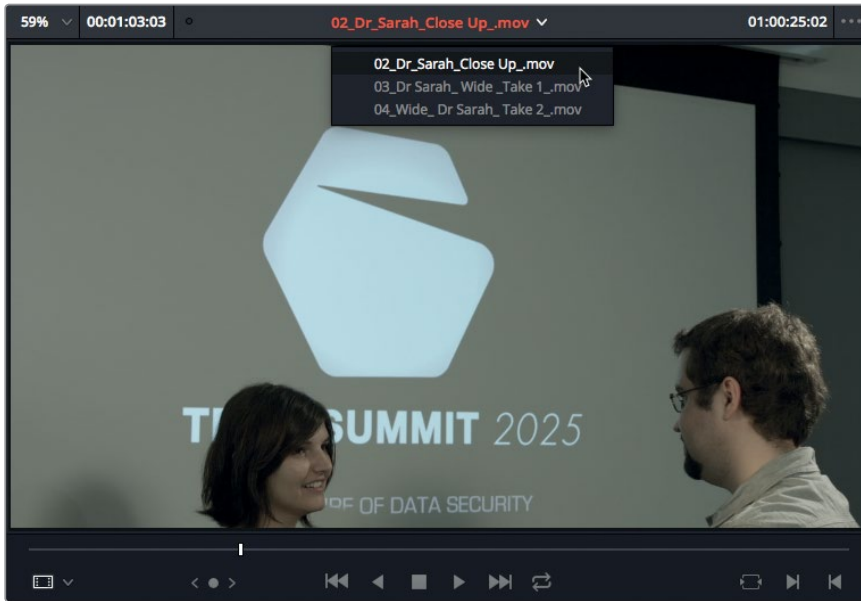
Editing is a series of choices. Your first choice is often to sort through the daily collection of clips and single out the best takes. After that, you can start to block out the scene.

Watching each take and choosing those parts that feature the best performances is often the most time-consuming part of your entire editing process, but it is also a critical step in becoming familiar with the available content available and identifying which shots might and might not work. In Resolve, creating subclips is one way to help identify the best selections, or selects, within each clip. A subclip is a totally new instance of a clip that you create from a selection within a longer clip. By creating subclips of your content, you can avoid repeatedly sifting through long clips looking for a particular bit you remember. If you make subclips while locating the good bits within clips, you'll instantly be able to find them again.

NOTE When working in Resolve, you often have a choice of many routes to the same result. The workflows described in this book have proven to be creative, efficient, and flexible for each task. They also emulate workflows that many editors use on a regular basis. Ultimately, however, your preferred workflows will emerge from your own methods and experiences.

- 1 In the Project manager, right-click and choose Import. Navigate to R15 Editing 201 > Lessons > Lesson 03 Dialogue, and select R15 Editing Lesson 03 Dialogue.drp. Click Open, and click OK to import the project into your Project manager.
- 2 Open the project, and relink media files.
- 3 On the Edit page, in the Media pool bin list, select the “Dailies day 02” bin.
- 4 Drag all three clips in this bin into the source viewer.

By dragging these clips into the source viewer at the same time, you can access them using the recent clips pop-up menu at the top of the viewer. Doing so provides an easy way to switch between the last 10 clips you loaded in the source viewer without searching for them in the Media pool.

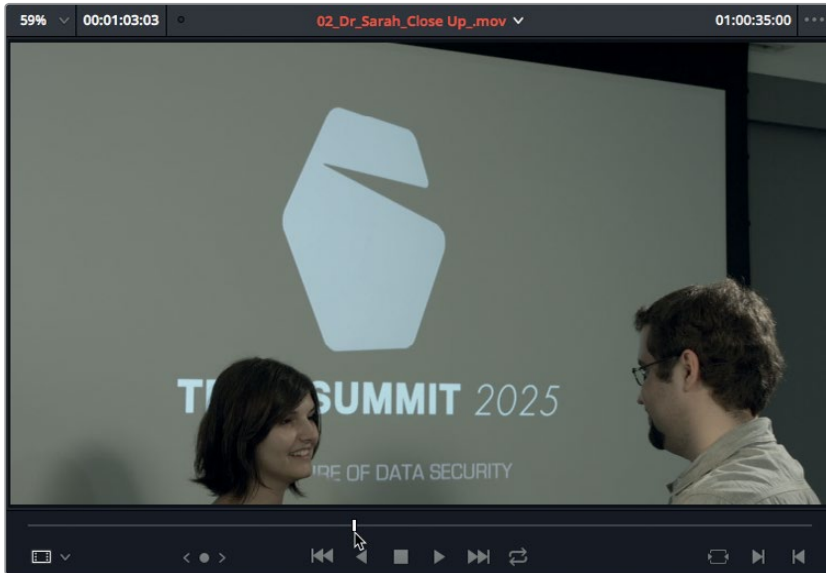


- 5 If it's not already open in the viewer, select **02_Dr_Sarah Close Up_.mov** in the recent clips pop-up menu to load it into the source viewer.

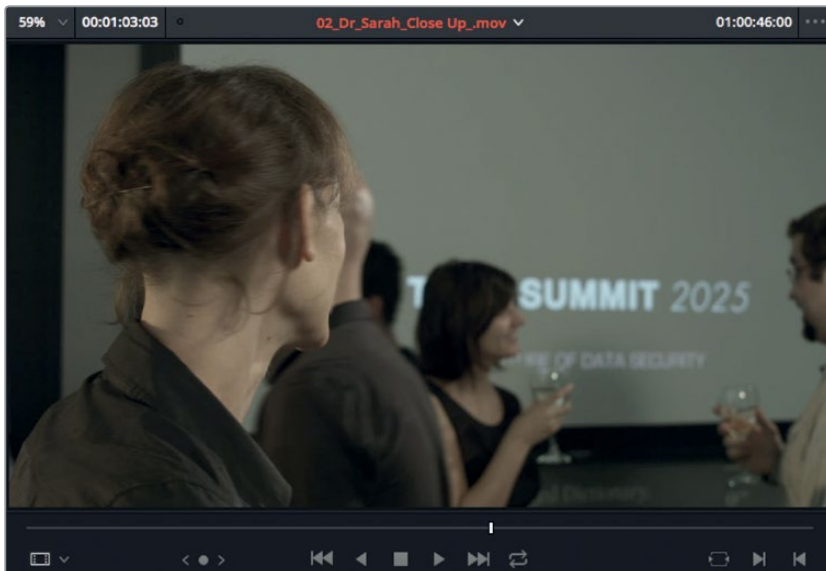


This clip starts with a clapper and takes a good 20 seconds to get going. Instead of watching or scrubbing through the unusable range each time you return to this clip, you can make new subclips based on in and out points that you set.

- 6 Scrub through the clip until just before the woman enters from the left at around 01:00:35:00.

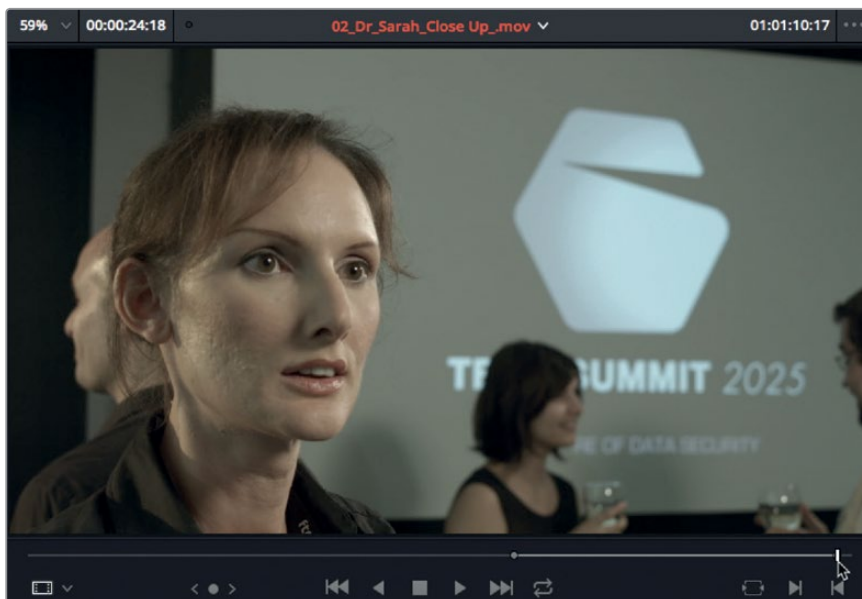


- 7 Play the take until she turns her head toward the camera and stop playback.
The director has decided that the bald male actor is not making the cut, but you can still use the remaining portion of the take.
- 8 In the source viewer, type 46. (period) on the keypad, and press Enter to move the playhead to 01:00:46:00.

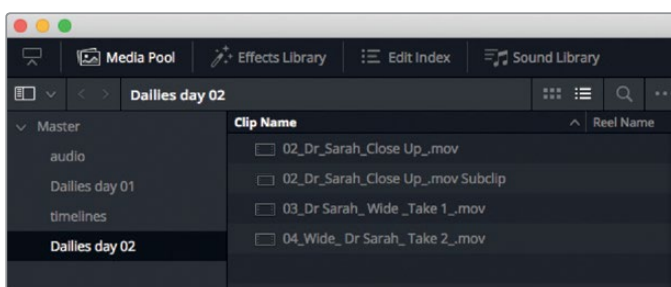


This location is far enough into the clip to cut out most of the bald actor and makes for a good starting point for your subclip.

- 9 Press I to mark an in point that identifies the start of your subclip.
- 10 Play the clip until you hear the director yell, “Cut” at around 01:01:10:00, and mark an out point.



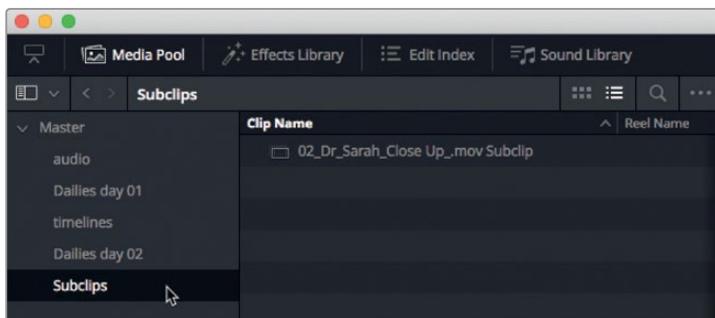
- 11 To make a subclip based on these in and out points, choose Mark > Create SubClip, or press Option-B (macOS) or Alt-B (Windows).



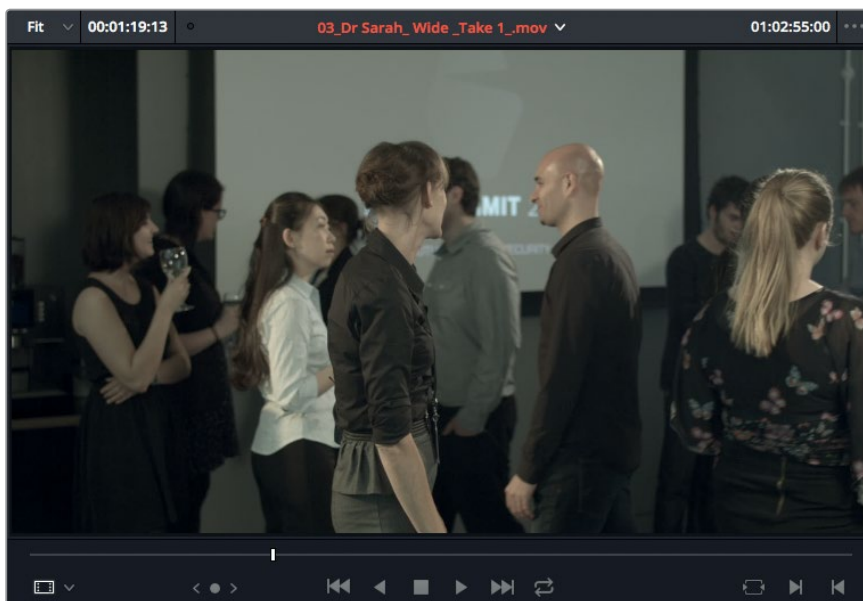
In the Media pool, in list view, look at the contents of the Dailies day 02 bin. You can see that a new clip is underneath its parent clip. Notice that the word “subclip” is appended to the file name. You might find it useful to keep these subclips in a separate bin so you don’t confuse them with the original source clips.

- 12 Choose File > New Bin, or press Shift-Command-N (macOS) or Shift-Ctrl-N (Windows) to create a new bin. Name this bin **Subclips**.

- 13 Select the Dailies day 02 bin. Drag the **02_DrSarah_Close_Up_.mov** subclip to the Subclips bin, and select the Subclips bin to see its contents.

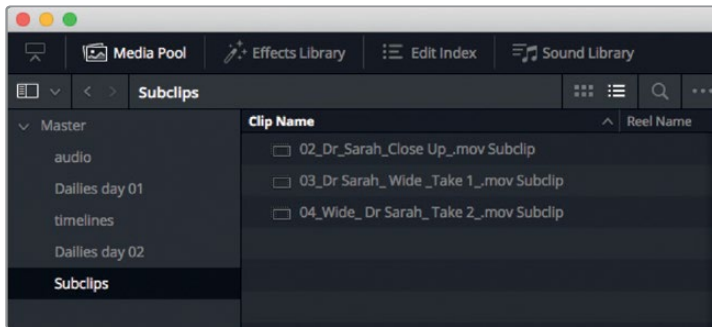


- 14 In the source viewer recent clips pop-up menu, choose **03_DrSarah_Wide_Take 1_.mov** to open it in the source viewer.
- 15 Play the clip from the beginning and mark an in point when the bald actor begins to walk away at around 01:02:55:00.



- 16 Press L twice to fast forward to the end of the clip where the director yells, “Cut” at around 01:03:50:00, and mark an out point.
- 17 Press Option-B (macOS) or Alt-B (Windows) to create another subclip in your currently selected Subclips bin.
- 18 In the source viewer recent clips pop-up menu, choose **04_Wide_DrSarah_Take 2_.mov**.

- 19 Again, because this is a second take of the wide shot, play the clip from the beginning, and mark an in point when the bald actor begins to walk away.
- 20 Press L twice to fast forward to the end of the clip where the director yells, “Cut,” and mark an out point.
- 21 This time, drag the marked clip from the source viewer back into the Subclips bin in the Media pool.



The new subclip is added to the bin.

Although a subclip is totally independent of its source clip, it does differ from placing a duration marker to identify a portion of a clip, which is a technique you may already be familiar with. Unlike ranges identified by duration markers, you can organize subclips into their own bins, load them into the source viewer, add metadata, and edit them into the timeline using any of the editing functions in Resolve. In effect, you're treating them exactly like any other source clip.

TIP You can convert existing in and out points into duration markers by choosing **Mark > Convert In and Out to Duration Marker**, or convert existing duration markers to in and out points by choosing **Mark > Convert Duration Marker to In and Out**.

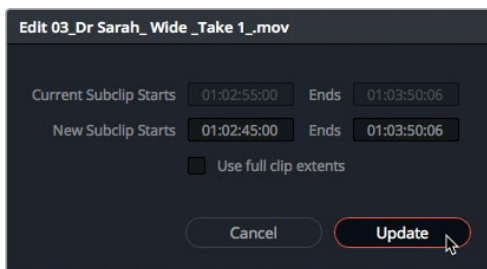
However, remember that when you edit using a duration marker to identify a portion of a source clip, you still have handles available on either side of the marker after it is placed in the timeline. By default, a subclip has no handles beyond the initial in and out points you used to create it.

Modifying Subclips

To simulate handles in a subclip, it's useful to set your initial in and out points a little before and after the portion you want to subclip, thereby leaving a little bit of wiggle room when you later trim the clips.

However, when you find that you need a few extra frames extra not included in your subclip, you can always extend the boundaries of that subclip.

- 1 Double-click the **04_Wide_DrSarah_Take 2_.mov Subclip** to load it into the source viewer and see the full extent of the subclip you created in the previous steps.
- 2 In the Media pool, right-click the **04_Wide_DrSarah_Take2_.mov Subclip**, and choose Edit Subclip.



In the dialog that appears, you can adjust the subclip's start and end values or remove the limits of the subclip entirely.

- 3 Change the New Subclip Start time to 10 seconds earlier and click Update.

The source viewer updates the positions of the in and out points to reflect this change, and the bald-headed man is once more included in this subclip.

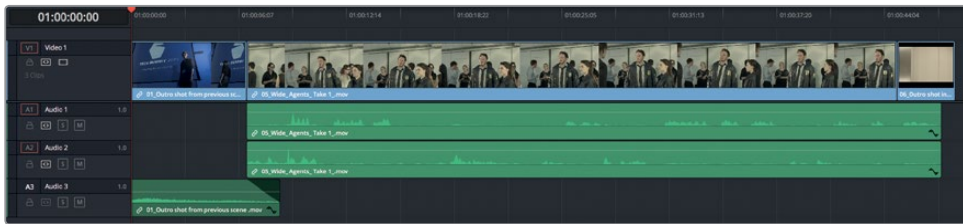
Editing with Continuity

One method to use when cutting dialogue is to first identify which take is the *master shot*, a clip that represents a complete good take in terms of dialogue and action. Ideally, this clip can form the backbone of the scene. You can then replace part of that master shot with close-ups and reaction shots that build both time and space continuity.

TIP When you don't have one shot that works as a master shot, you can assemble a very rough cut that effectively blocks out the scene and represents a clear idea of the target.

In the following exercise, a quick master shot timeline was created for you.

- 1 In the timelines bin, double-click the “Party’s over edit” timeline to open it in the timeline viewer.

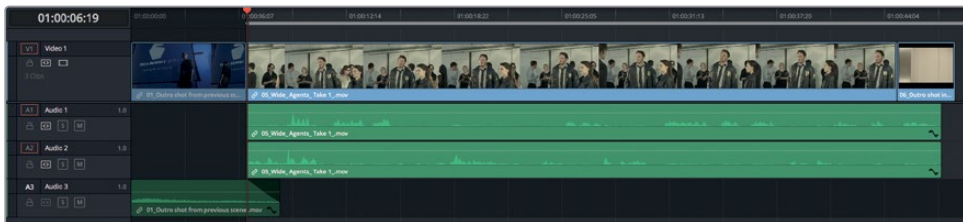


This timeline will act as the master shot for this scene. Let’s play it to see how the scene should unfold.

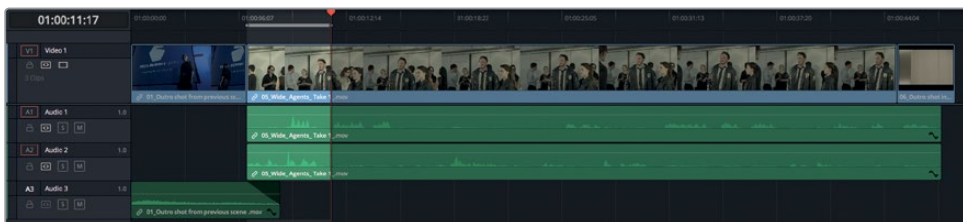
- 2 Play the timeline from start to end.

This master shot focuses on the FBI agents, so it is up to you to add reverse angle shots of the doctor. Some editors call the next step “removing the air;” but, more precisely, it consists of eliminating unnatural intonations or pauses in the dialogue when you cut between reverse angles.

- 3 In the “Party’s over edit” timeline, navigate to the cut point between the first two clips, and mark an in point.



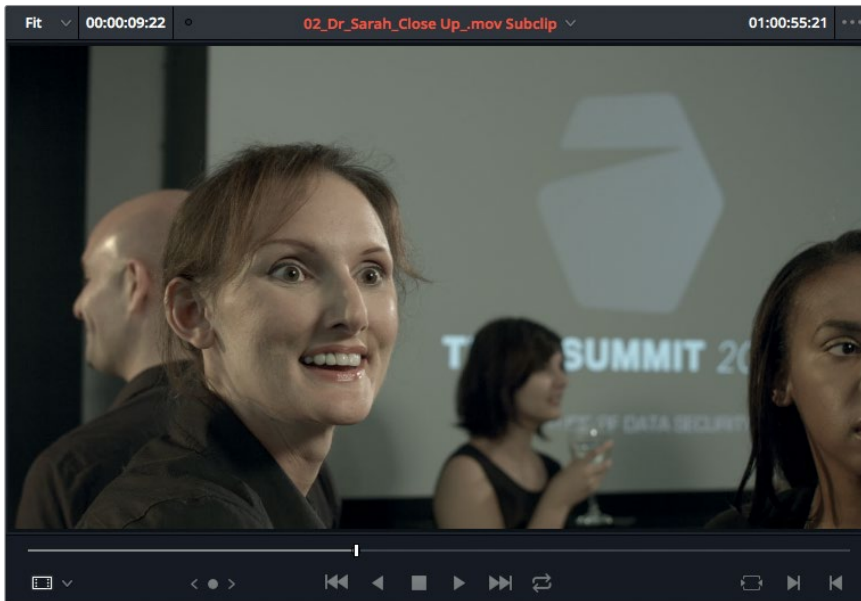
- 4 Play the clip until the FBI agent says the doctor’s name, and you hear her off-screen response, “Yeah?” Mark an out point just before the agent speaks again, around 01:00:11:20.



- 5 In the Subclips bin, double-click **02_DrSarah_Close Up_.mov Subclip** to open it in the source viewer.

Let’s start by marking an out point because it will be easier to locate.

- 6 Play the clip until the doctor turns her head, and mark an out point just after she says, “Ah yes?”



You need just a bit of this clip to show the party scene and introduce the lead female character.

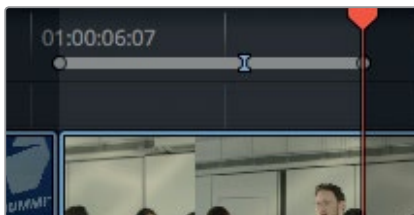
- 7 In the source viewer, type -3. (minus sign, 3,period), and press Enter to move the playhead back three seconds.

Because this dialog is just incidental chit-chat before the doctor turns, you can place an in point here.

- 8 Press I to mark an in point.

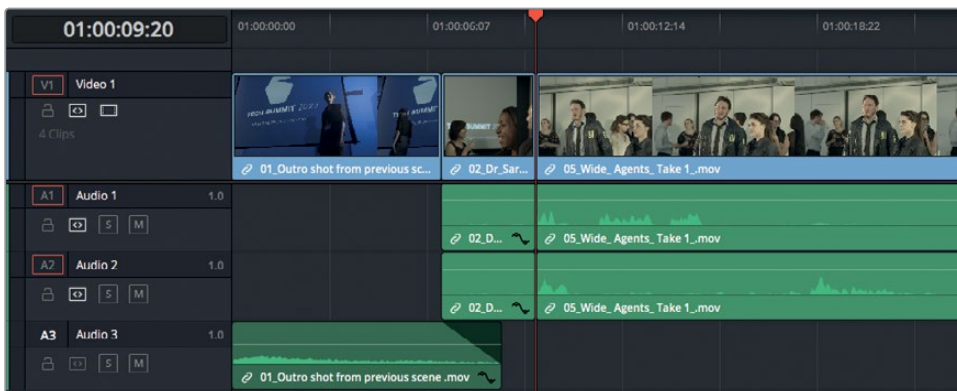
Unfortunately, you have a slight timing problem here: all four marked points are well placed, but the resulting durations of your two selections differ. You can preview the edit using the preview marks.

- 9 Choose View > Show Preview Marks.



The preview marks display a virtual outpost in the timeline ruler to indicate where the source clip's out point will land.

- 10 Press F10, or click the Overwrite Clip button above the timeline.

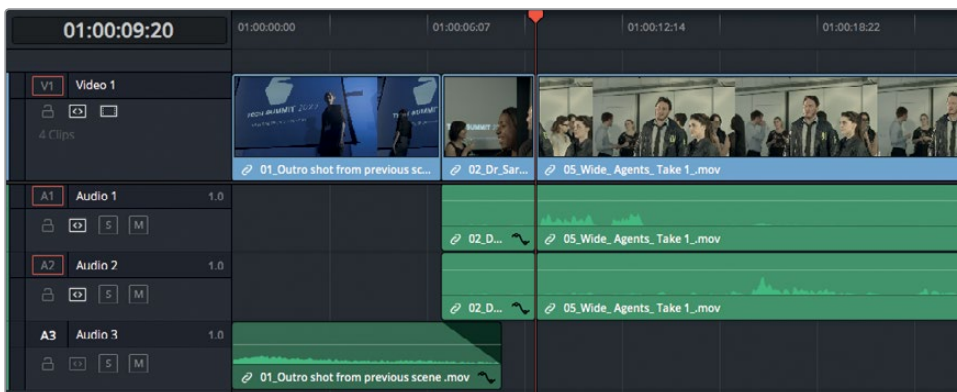


Performing an overwrite edit limits the edit based on the shorter source clip and leaves a long pause as the FBI agent walks into frame. If you were to proceed with this edit, you would have to trim the pause to correct for the continuity of the scene.

- 11 Choose Edit > Undo, or press Cmd-Z (macOS) or Ctrl-Z (PC)

Fortunately, Resolve has a unique edit called ripple overwrite that will overwrite the source clip and appropriately trim the timeline with just one click. The ripple overwrite replaces a selection in the timeline with a clip of a different length and does so without opening a gap or overwriting the adjacent clip.

- 12 Choose Edit > Ripple Overwrite or press Shift-F10 to perform the ripple overwrite edit.



In the timeline, play over the edit to verify that you have successfully overwritten the unwanted part of the clip with a shot that introduces the doctor. This time, the frames between the preview mark and the timeline's out point were automatically removed by the ripple overwrite edit.

You've just used a continuity editing style by alternating shots between the doctor and the FBI agents. These shot/reverse shot sequences create a sense of space by matching the characters' eyelines along the axis of action (that is, the 180-degree line). The FBI agents are looking to the left at the doctor, and in her shot, the doctor is looking to the right at the agents.

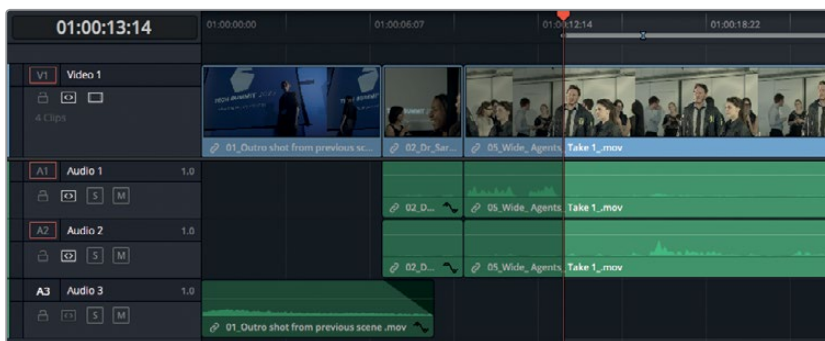
Match Frame with an Offset

Let's try another example of continuity editing by cutting in another reaction shot of the doctor. This time you'll use Resolve's match frame feature to keep the source clip and timeline in sync, making it easier to cut in reverse angles.

- 1 In the timeline, position the playhead at the end of **02_DrSarah_Close Up_.mov Subclip**.
- 2 Play the timeline for roughly 10 seconds until you hear the off-screen doctor, say, "I'll catch up with you later."

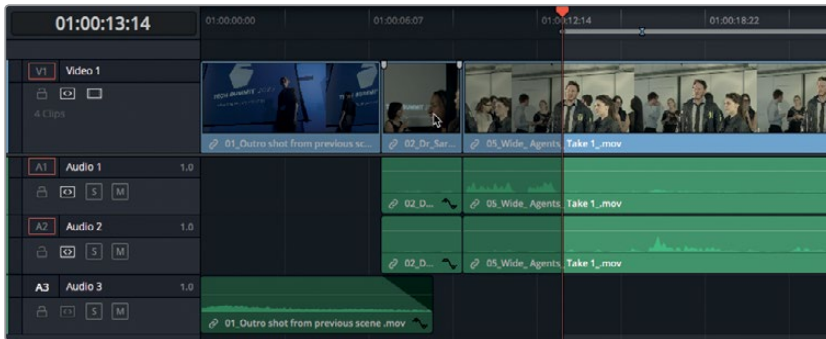
You need a reaction from the doctor to indicate that the FBI is showing up at her party, and you want to end the reaction shot in time to cut back to the FBI agents to get their impatient reactions.

- 3 Position the timeline playhead after the FBI agent says, "We need you to come with us right away" and before the doctor says, "Umm.," roughly three to four seconds from the last cut.
- 4 Press I to mark an in point in the timeline.

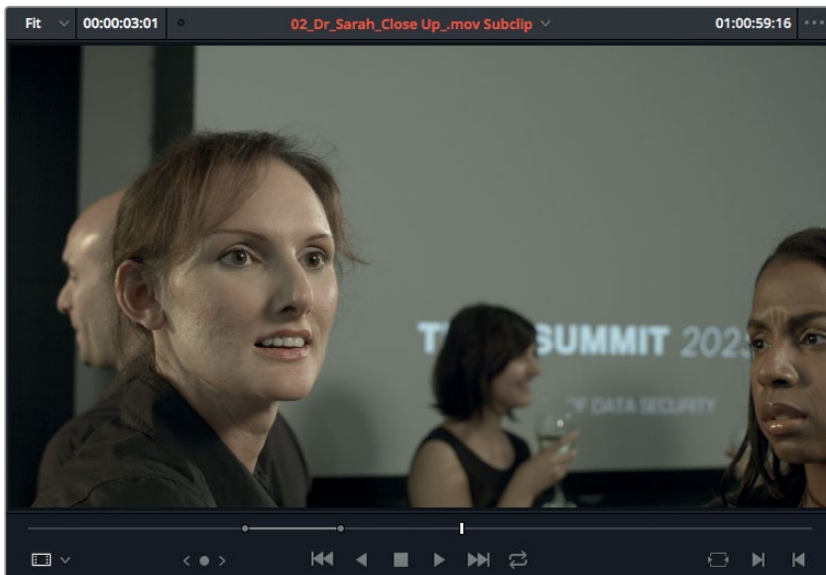


At this point you can turn your attention to the source clip that you want to cut in. Because the dialogue is the same on both the doctor's close-up in the source viewer and the FBI agent's shot in the timeline, you want to pick up the source clip dialogue in a spot that roughly matches your timeline playhead location. Resolve has a very nice match frame feature to do just that.

- 5 Without moving the timeline playhead, in the timeline, Option-double-click (macOS) or Alt-double-click (Windows) anywhere on the previous **02_DrSarah_Close Up_.mov Subclip**.

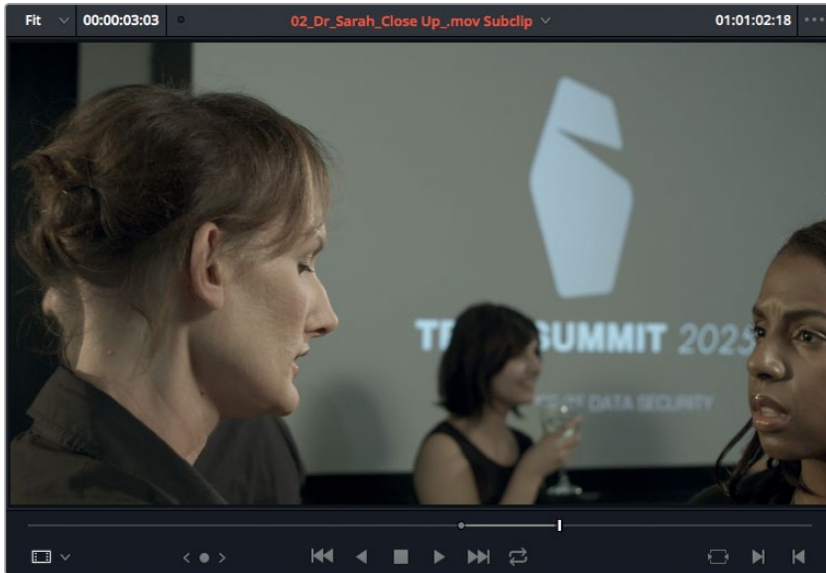


The **02_DrSarah_Close Up_.mov Subclip** is loaded in the viewer with the previously marked in and out points used to edit the clip into the timeline.



The playhead in the source viewer is offset from the out point by the same three to four seconds that you moved the timeline playhead. This is where the doctor starts to react to the FBI and her assistant stops speaking. It's a good place for your in point.

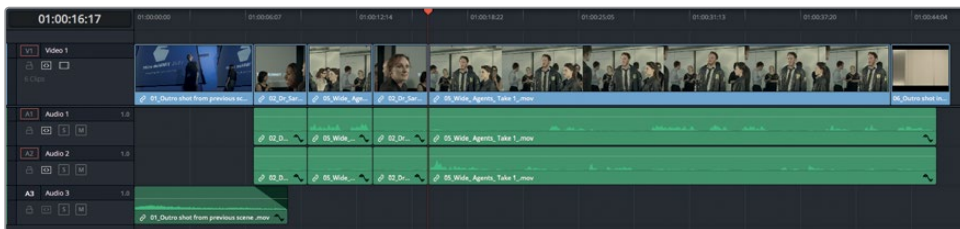
- 6 Press I to mark an in point in the source viewer.
Let's place the out point after the friend asks if the doctor is OK, and the doctor turns away.
- 7 Play the clip in the source viewer, and mark an out point just after the doctor turns her head, but before she says, "Yeah, yeah," at around 01:01:02:20.



This time, a preview mark appears in the timeline showing us the implied outpost.

- 8 Play forward in the timeline, and set an out point just after the doctor's assistant asks, "Is everything ok, Sarah?" but before the doctor starts to reply.
- 9 Press Shift-F10 to perform a ripple overwrite edit.

Now you have placed your shot/reverse shots to move this dialogue scene forward. Let's review the edits.



- 10 Press the Home key, and play the timeline to review your edits.

This type of shot/reverse shot juxtaposition is the most common technique used to initially block out your scene. That's why the ability to keep the same offsets between source and timeline using the modified match frame feature is a major time saver.

Going Beyond the Straight Cut

A *straight cut*, with which audio and video start and end simultaneously, can be quite abrupt and a little jarring. A *split edit*, often referred to as either an *L-cut* or *J-cut* because of the implied shape it creates in the edit, delays either the audio or video cut of a clip. Staggering the cuts this way can create a more natural transition between shots.



J-cut



L-cut

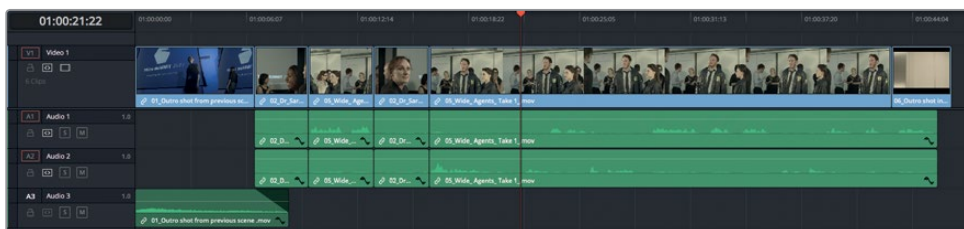
The most common split edit is the J-cut, in which you first introduce the sound of the next shot and then cut to the picture a beat or two later. This is the way that most of us perceive the world around us; for example, when you hear a car horn in the street, you will look for the source of that sound a fraction of a second later. An L-cut leads with the image and then cuts in the audio, often used when you want to show a character's reaction to something happening or being said.

In Resolve, you have multiple ways you can create J- and L-cuts. Let's look at a J-cut split edit in which the upcoming clip audio is heard first, and the picture edit is slightly delayed.

Extending Edits

A common way to create a split edit is to trim either the video or audio part of the clip after a straight cut was made in the timeline. Let's cut in another shot using a simple straight cut, and then adjust the video of that clip to create the J-cut.

- 1 In the timeline, position the playhead at the end of the last **02_DrSarah_Close Up_mov Subclip** that you just edited into the timeline
- 2 Play the timeline for roughly 10 seconds until you hear the off-screen doctor say, "So are you going to tell me what this is about?"



You want the audience to see the impatient reaction of the FBI agents and then hear her line. Because you don't have this line in the close-up shot, you'll need to switch to one of the wide shots.

- 3 In the Subclips bin, double-click **04_Wide_DrSarah_Take 2_.mov Subclip** to load it into the source viewer.
- 4 Play from the start of the clip until you hear the doctor say, "So, are you going to tell me what this is about," at around 01:05:42:00.

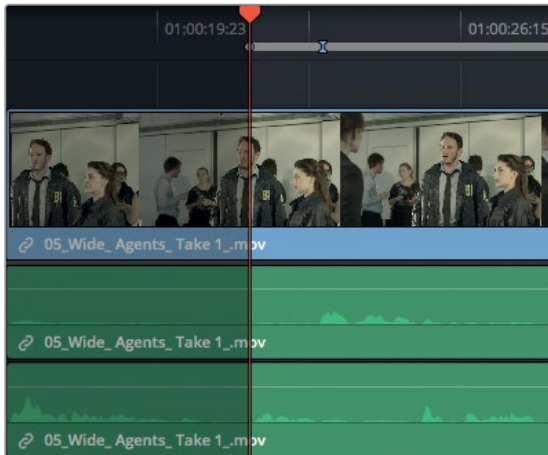


That's the line you want to use in your timeline.

- 5 Position the source viewer around 01:05:42:12, and mark an in point just as the doctor begins turning toward the camera.
- 6 Play the clip until the doctor finishes her line, "Are you going to tell me what this is about?" Add an out point before the agent replies with "We need your help."



- 7 In the timeline, set an in point where the doctor has turned to face the FBI agents, just before she says, “So are you going to tell me what this is all about?”

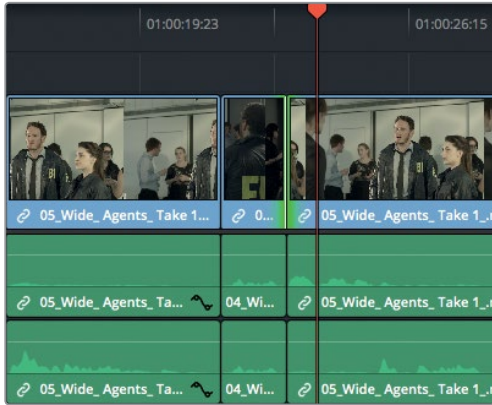


At this point in the timeline, you may notice that the preview mark for the source out point indicates that the delivery of this line in the **04_Wide_DrSarah_Take 2_.mov Subclip** is just a tiny bit longer than the current take in the timeline.

- 8 In the timeline, play forward and set an out point after the doctor says, “So are you going to tell me what this is all about?” but before the FBI agent says, “We need your help”.
- 9 Press Shift-F10 to perform a ripple overwrite edit.

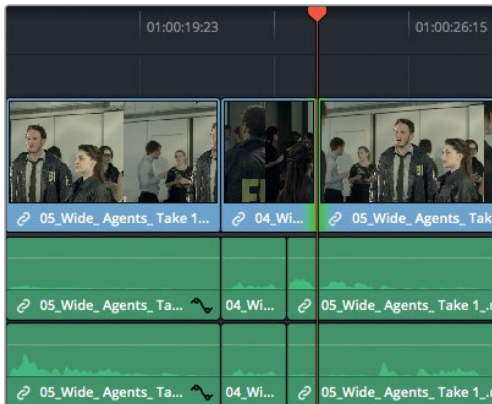
OK, so that fixed the timing of your new take. Now you need to split the edit.

- 10 In the timeline, Option-click (macOS) or Alt-click (Windows) the video edit between **04_Wide_ Dr Sarah_ Take 2_.mov Subclip** and **05_Wide_ Agents_ Take 1_.mov**.
- 11 Play forward until the FBI Agent has said, “We need your help.”



- 12 Choose Trim > Extend edit, or press E.

The extend edit moves the selected edit point to the position of your playhead in the timeline, in this case performing an instant rolling trim.



Review your new split edit.

That edit now feels very natural in that you see the doctor react to the FBI agent’s demand, while the FBI agent’s line of dialogue motivates the picture cut a second or so later. This is a powerful editing technique that is used all the time not just in dialogue scenes such as this, but in editing across all genres.

Marking Split Edits

A more sophisticated way to create a split edit is to actually mark the split in and out points on either the source viewer or timeline. Let's cut in the next shot using this technique.

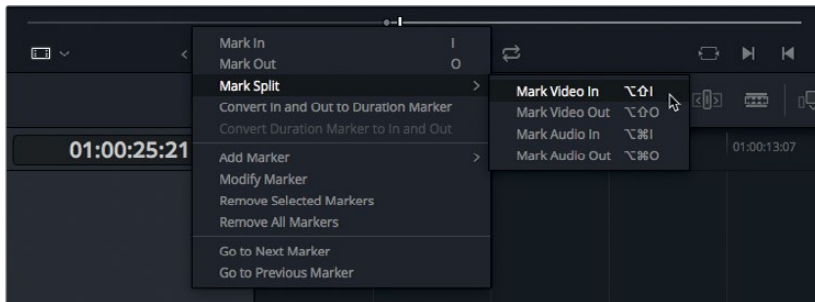
- 1 Play the timeline until you hear the doctor say, "My help? You'll have to do better than that."

This is where your next shot will be cut in. Again, you'll use the reverse wide shot of the doctor.

- 2 In the timeline, position the playhead before the doctor says, "My help?," and mark an in point.
- 3 In the source viewer, play **04_Wide_Dr Sarah_Take 2_.mov Subclip**, and mark an in point at the start of the doctor's line "My help?" at around 01:05:46:00.

This is where you want the audio to start, but you don't want the video to cut just yet.

- 4 Play forward in the source viewer, and stop playback just before the doctor delivers her next line, "You'll have to do better than that," at around 01:05:47:00.
- 5 Under the source viewer, right click anywhere along the jog bar, and choose Mark Split > Mark Video In, or press Shift-Opt-I (macOS) or Shift-Alt-I (Windows).



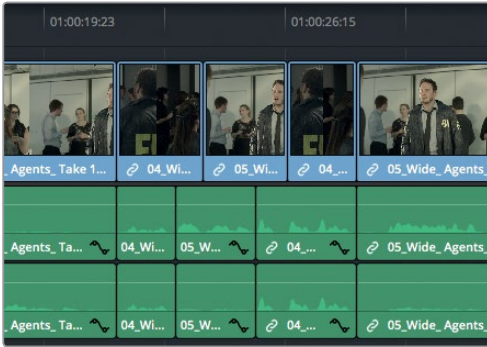
The jog bar splits into two lines. The green line indicates the in point for the audio and the blue line shows the different in point for the video. Of course, you still need to place an out point.



TIP You can use the same method to mark split edits directly in the timeline or timeline viewer.

- 6 Play forwards in the source viewer until the doctor finishes her line. Set a regular out point after she says, "You'll have to do better than that."

- 7 Press F10 to perform an overwrite split edit and play over the new cut to review it.

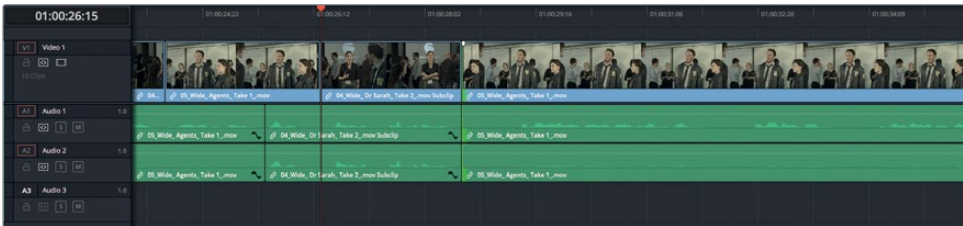


Congratulations! You have just learned two different methods for adding split edits and created two effective J-Cuts to enhance the flow of this scene. In the next exercise, you'll learn some other techniques for trimming in real-time.

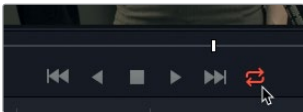
Trimming On-the-fly

The extend edit is a powerful feature that works with ripple trims as well as rolling trims. In fact, it works well anywhere you want to quickly trim to the playhead. Let's explore this by working on the end of the cut you just made. This time, however, you'll perform an extend edit on-the-fly. By just listening to the cut and trimming in real-time as the edit plays, you can get a better feel for the trim. You will hear and see how the edit works in real-time instead of just looking at incremental frame updates and hearing audio scrubbing.

- 1 In the toolbar, click the trim mode button, or press T.
- 2 Select the head of the last video and audio cut for the **05_Wide_Agents_Take 1_clip**.



- 3 Under the timeline viewer, click the loop button.



With loop play activated, Resolve will continuously play whatever playback option you choose. To loop play over the trim point, let's play the selection.

- 4 To review the edit, press / (slash) to loop play the selection.

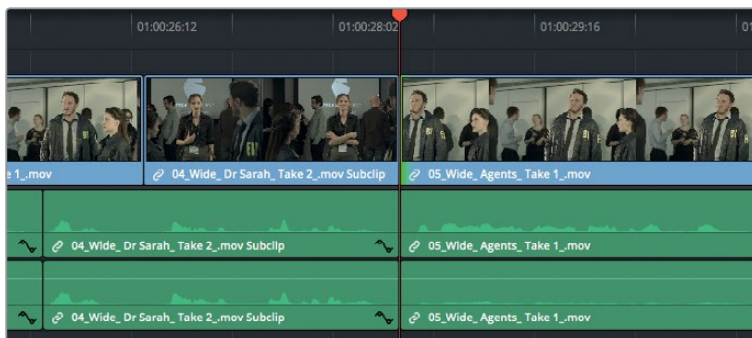
A long gap is present between the doctor's last line and the FBI agent's response. Let's trim that gap on-the-fly.

- 5 After the doctor speaks her line, but before the FBI agent says, "OK we don't have a lot of time," press the E key to mark a new cut point to remove some of the silence between the two lines. (Use the waveforms of the audio on the first track as a guide.)
- 6 Let the selection loop play a few times, and modify the edit by pressing either , (comma) to add a single frame to the head or . (period) to remove a single frame from the head.
- 7 When you feel the edit is right, press spacebar to stop playback.

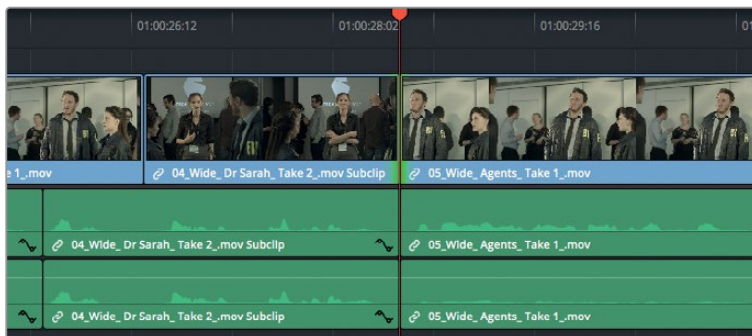
The rhythmic beats of your audio and the associated sound edits contribute significantly to the pacing and mood of a scene. Trimming on-the-fly is one way to realize the most natural and organic feel with that rhythm.

Let's continue practicing trimming on-the-fly with another cut. You'll bring the video cut back a bit to see a little more of the FBI agent's reaction. You'll make the selection in the timeline using keyboard shortcuts.

- 8 Press Opt-U (macOS) or Alt-U (Windows) to deselect the audio track and make the selection video-only.



- 9 Press U twice to cycle the selection until both side of the cut are selected, as indicated by the green highlight.



- 10 To loop the edit, press / (slash) to play.
- 11 As the doctor finishes her line and the FBI agent steps back in toward her, press the E key to roll the edit back a second or so to create an L-cut.
- 12 Let the selection loop a few more times, and modify the edit by pressing either , (comma) to roll the edit back one frame or . (period) to roll it forward one frame.
- 13 Press the spacebar when you have finished perfecting your edit.
- 14 In the toolbar, select the selection tool, or press A.

By this point, you should be well aware that J- and L-cuts are all about keeping the edit flowing seamlessly. Offsetting the audio or video cuts from each other even slightly allows you to keep the dialogue moving forward while giving the audience a peek at the reaction of other characters helping the whole edit knit together better.

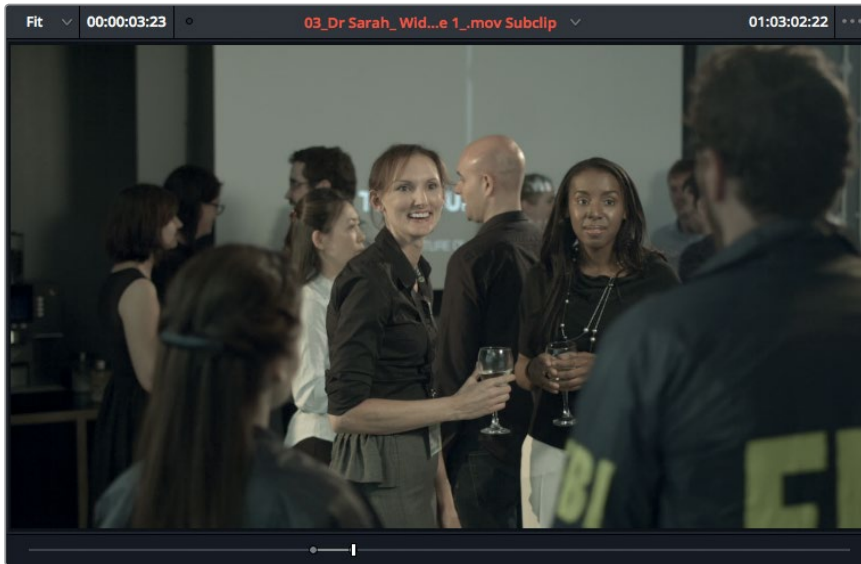
To finish this scene off, you have one more reaction shot of the doctor to add. Using any of the techniques you've learned so far, add the shot of the doctor delivering the line, "You mean like a virus? That wouldn't be possible," in the **04_Wide_DrSarah_Take 2_.mov subclip**. Don't forget to use split edits to show her reaction to the news the FBI agent gives her! You may also want to revisit the other edits you previously made in this scene. Assuming the pacing of the dialogue works, can any of the cuts be improved by splitting the video edits?

Auditioning Multiple Takes

When cutting dialogue, you can easily fall into the trap of cutting based solely on words. But dialogue editing is trickier than that because you not only have to pay attention to the words, but also the eyes, the mouths, and the body language of the performers. All these performance elements are essential to establishing the emotion of a scene. So, even though your cut may maintain dialogue continuity, you might want to search out alternate takes that feature superior performance elements.

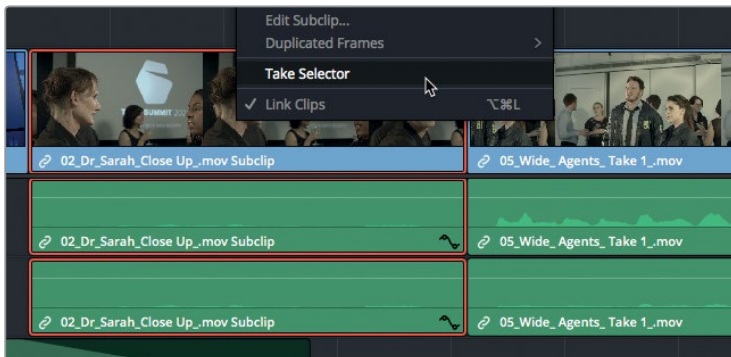
Comparing different takes often means repetitively revising your timeline. DaVinci Resolve makes this process a lot easier with the Take Selector.

- 1 In the timeline, position the playhead at the second shot in your timeline, **02_Dr_Sarah_CloseUp.mov Subclip**.
The director feels this shot doesn't effectively introduce the party and wonders how the wide shot might look in its place.
- 2 In the Subclips bin, double-click **03_DrSarah_Wide_Take 1_mov Subclip** to open it in the source viewer.
- 3 Play the first half of the subclip to review it and refamiliarize yourself with the take.
- 4 Mark an in point just before the FBI agent walks into shot, around 01:02:59:00.
- 5 Mark an out point when the Doctor turns and says, "Yeah," around 01:03:03:00.



To audition this take in the timeline without actually replacing the current close-up shot, you can use Resolve's take selector.

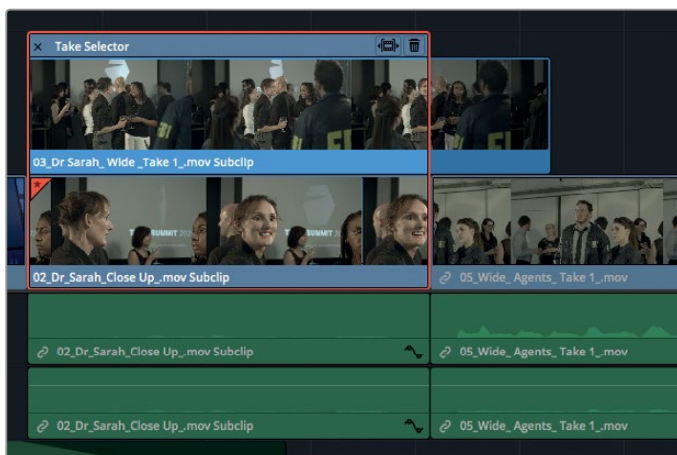
- 6 In the timeline, right-click **02_Dr_Sarah_close up**, and choose Take Selector.



The take selector acts like a container for multiple clips. While only one of those clips is seen when you play the timeline, you can switch between the clips at any time.

- 7 From the source viewer, drag the **03_Dr Sarah_Wide_Take 1_Subclip** onto the take selector clip in the timeline.

TIP The rest of the timeline is inactive when the take selector is in use.

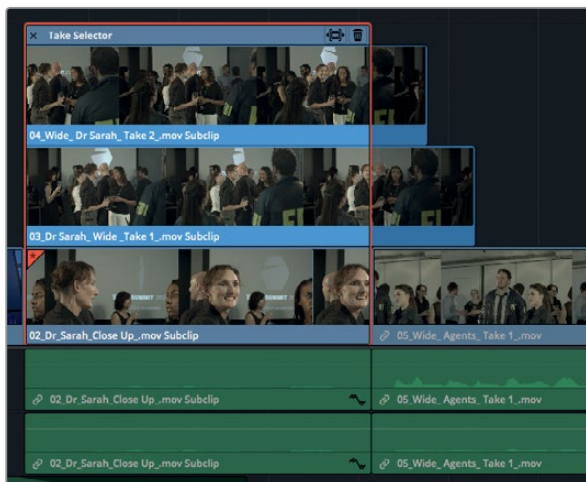


The take selector now shows the two clips stacked on top of each other.

You can add as many takes as you want to audition.

- 8 In the Subclips bin, double-click **04_DrSarah_Wide_Take 2_.mov Subclip** to open it in the source viewer.
- 9 Mark an in point in roughly the same part of the shot as the previous take, just before the FBI agent walks into shot; and mark an out point when the doctor turns and says, “Yeah?”
- 10 From the source viewer, drag **04_DrSarah_Wide_Take 2_.mov Subclip** onto the take selector clip in the timeline.

TIP You can also drag the clip from its bin in the Media pool directly into the take selector.



Now all three takes are visible in the take selector. The initial clip is still the active take, but you can change that by clicking the clip you want to view in the timeline.

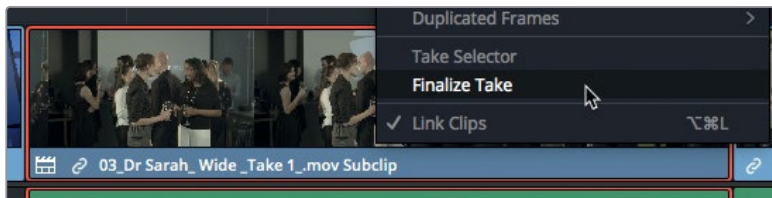
TIP The currently selected take in the take selector is actually the clip with the dullest brightness, thereby matching the other clips in the timeline.

- 11 In the take selector, click the middle clip in the stack to view it in the timeline.
- 12 Press the / (slash) key to play over the new take.
The new clip conforms to the duration of the original clip in the timeline. However, you can see in the take selector stack that the new take is longer than the original clip. When you select a take that is shorter or longer than the original clip, you can ripple the timeline to adjust to the new take's length.
- 13 In the upper-right corner of the take selector, click the ripple button.



The timeline now adjusts to fit the longer take.

- 14 Move the playhead to the start of the clip and click play to review the rippled timeline.
- 15 In the take selector, click the upper clip to view it in the timeline.
- 16 Move the playhead to the start of clip, and play to review this take.
The director believes the middle wide-angle take introduces the party scene the best, so you'll make the new take a permanent part of the timeline.
- 17 In the take selector, click the middle clip to choose that take.
- 18 In the upper-left corner of the take selector, click the close button to collapse the take selector stack.



- 19 Right-click the clip and choose Finalize Take.

TIP You don't have to finalize the take. You can leave the alternate takes within the take selector to review again later, if you choose. To reopen the take selector stack, double-click the take selector icon in the lower-left corner of the clip in the timeline.

While this lesson has been about editing dialogue, its underlying theme is continuity. Continuity editing involves matching screen direction, position, and temporal relations from shot to shot. Using the two-up display while trimming, trimming on-the-fly, applying ripple overwrite editing, and using the take selector are just a few of the many Resolve features that support this single most important principle of editing.

Lesson Review

- 1 What methods can you use to create a subclip from a marked duration of a clip in the Edit page?
 - A) Drag the clip from the source viewer to the Media pool
 - B) Press Option-B (macOS) or Alt-B (Windows)
 - C) Click the Source Viewer Options menu, and choose Make Subclip
- 2 What do the preview marks on the timeline indicate?
 - A) They show where you can add Markers
 - B) They help you determine where clips will be placed when making a three-point edits
 - C) They show you where your text and graphics will align on the Timeline Viewer
- 3 True or False? Ripple Overwrite is a three-point edit.
- 4 How can you change the pre-roll and post-roll times when playing around a selection in the timeline?
 - A) Pre-roll and post-roll times cannot be changed.
 - B) In DaVinci Resolve User Preferences
 - C) In the General Options of the Project settings
- 5 True or False? All clips in the take selector should all have the same duration.

Answers

- 1** A. and B. You can create subclips by choosing Mark > Create Subclip, and right-clicking the Source Viewer jog bar; then choose Create Subclip, press Option-B (macOS) or Alt-B (Windows), or drag the subclip from the source viewer into the Media pool.
- 2** B. Preview marks help you determine where clips will be placed whenever you execute a three-point edit.
- 3** False. Ripple Overwrite is a four-point edit that you use when the duration of the marked source clip is different from the duration marked in the timeline, and when you want the timeline to ripple to accommodate the difference in duration.
- 4** B. You adjust pre-roll and post-roll times are adjusted in the Editing panel of the DaVinci Resolve User Preferences.
- 5** False. The take selector can contain clips of different durations. When switching between these clips, you can enable the ripple take button in the upper-right corner (to the left of the trash can button).

Lesson 4

Making A Radio Edit

Editing interviews is a great skill to master. Being able to finesse an interview to get the very best out of your interview subject takes a lot of practice and a good ear for the spoken word.

When cutting interviews, whether for a documentary or a web promo, it's common to create the first cut to produce the best-sounding interview and almost completely disregard the visuals until that first rough cut is done. This cut is called a radio edit because it is similar to editing an audio-only interview. Once you have the interview audio cut properly, you can turn your attention to the video edits, often referred to as the paint because you are illustrating, or “painting”, your interview with appropriate pictures from your b-roll rushes.

In this lesson, you'll use advanced audio and video trimming and other workflow features in DaVinci Resolve 15 to finish an engaging one-minute promotional piece for a vegan restaurant.

Time

This lesson takes approximately 50 minutes to complete.

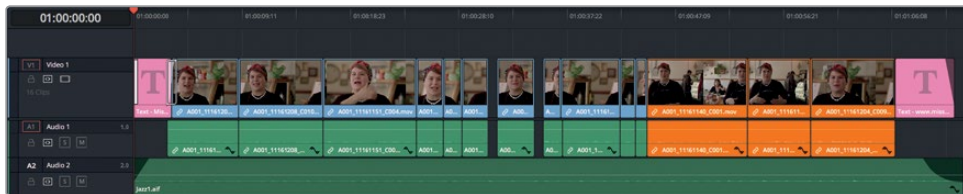
Goals

Examining Audio in a Radio Edit	114
Editing Subframe Audio	124
Creating Variable Speed Changes	126
Using Smooth Cut	130
Working with Advanced Transition Tools	131
Lesson Review	137

Examining Audio in a Radio Edit

Let's begin by opening a project with most of the radio edit already cut, but including some clips in which the audio hasn't been examined for clarity. You'll play the clips, and then begin to identify and remove the small stutters and stray "umms" to get the best statement from your interview subject.

- 1 In the Project manager, right-click and choose Import. Navigate to R15 Editing 201 > Lessons > Lesson 04 Radio Edit. Select R15 Editing Lesson 04 RadioEdit.drp, choose Open, and click OK to import the project into your project manager.
- 2 Open the project, and relink media files.
- 3 In the Media pool, select the timelines bin, and double-click the "01 Radio Edit start" timeline to open it in the timeline window.

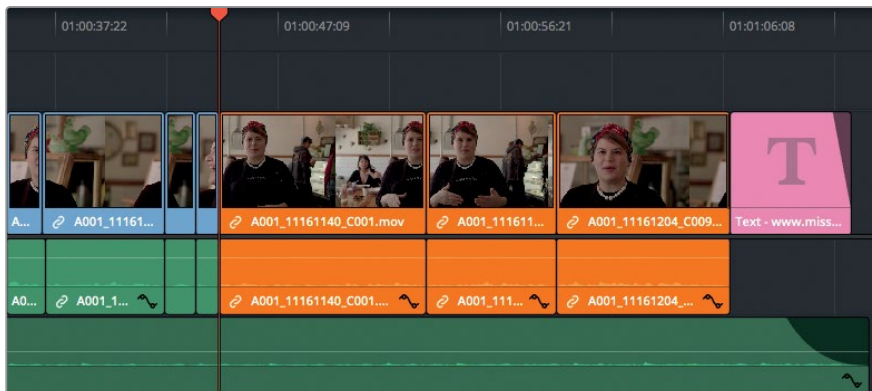


The first part of this interview with Miss Rachel, chef at the vegan restaurant, has already been cut for you.

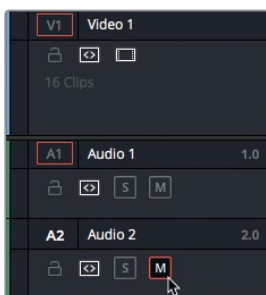
- 4 Play the timeline to hear the one-minute interview.

Notice how the interview is edited so it sounds clean, without many distracting pauses, stutters, or poorly chosen words. Check out the rushes from the Interview Clips bin to get a sense of how this edit was pieced together from the original clips. You will also notice a couple of small gaps that were left intentionally to add short pauses between thoughts or subjects and to allow the interviewee (and the audience) to take a breath. However, one area in this timeline still needs your attention.

- 5 In the timeline, go to the start of the first orange clip, around 01:00:45:00.



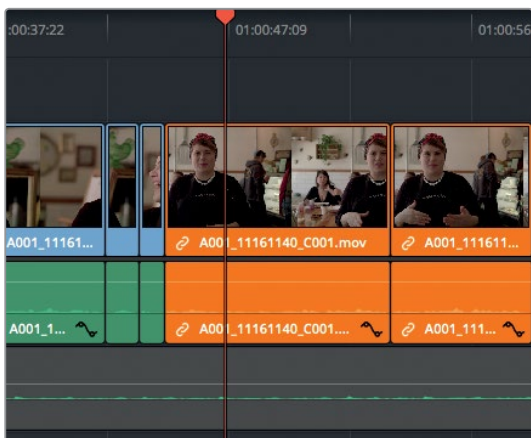
- 6 Mute Audio 2 and play the three orange clips to hear their audio content.



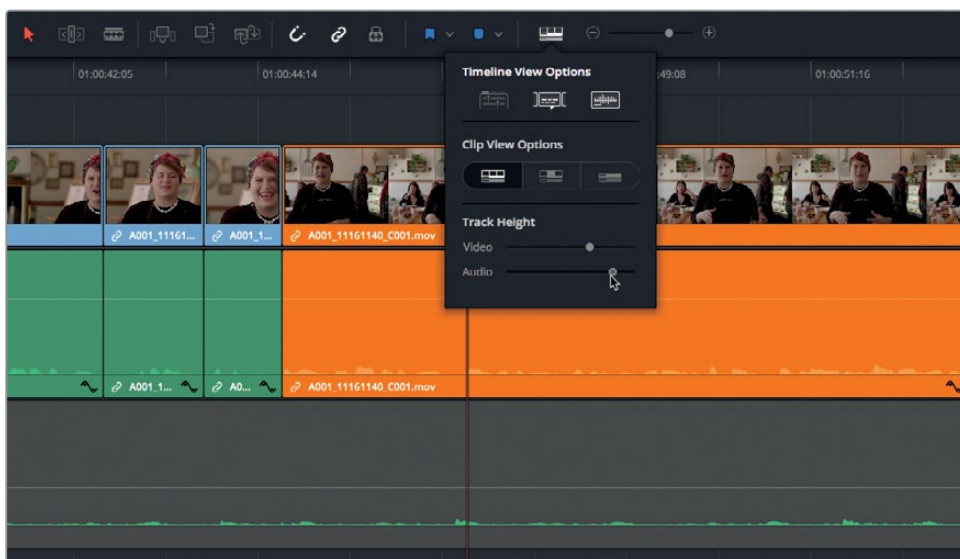
With the music track muted, it's easier to focus on the interview audio.

When creating a radio edit, you want to remove any large or small bits of audio that may detract from the message. These three clips, include a number of places where her words could be tightened to improve her conversational flow. You'll be looking at different techniques you can use to remove parts of this interview. As always, you'll need to consider which techniques work best for you.

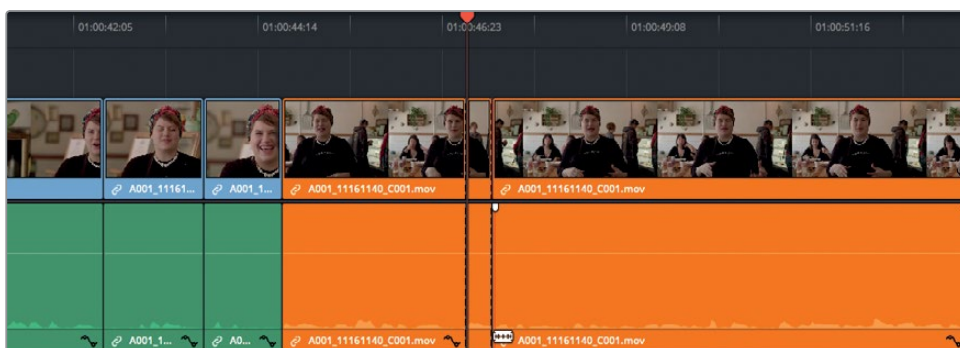
- 7 Play the first orange clip again and stop playback when you hear the first time that the interview subject says, "Umm," around two seconds from the beginning of this clip.



- 8 Using the Timeline View Options menu, expand the size of the audio track so you can clearly see the waveform. You may also want to zoom into the location of the playhead by pressing Cmd-= (equals sign) in macOS or Ctrl-= (equals sign) in Windows a couple of times. Now you should be able to clearly identify the problematic "Umm."



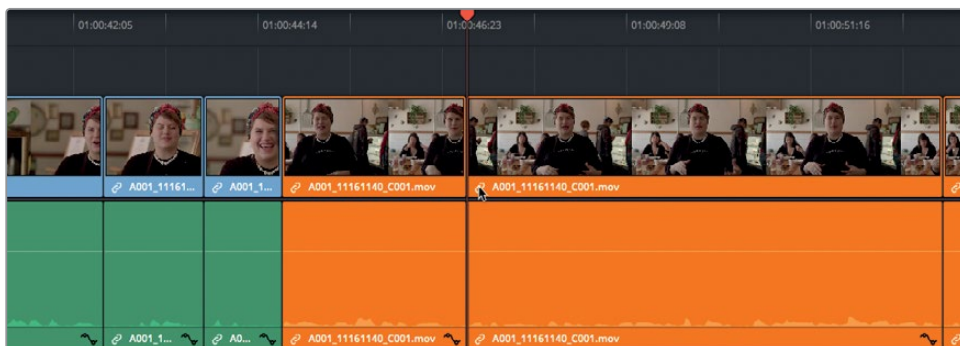
- 9 Press the B key to switch to razor edit mode. Click just before the waveform representing the “Umm” and just before she says, “We’re taking...”



Doing so has isolated the “Umm” into a separate clip. The dotted lines on the edit points represent through edits; that is, edits that are visible on the timeline but playback smoothly because no frames have been removed from either side of the cut. The edits were also added to both the audio and video parts of the clip because the timeline-linked selection was active.

TIP To remove an unwanted through edit, in the timeline, place your playhead after the through edit, and choose **Timeline > Join Clips**, or press **Option-** (backslash) in macOS or **Alt-** (backslash) in Windows.

- 10 Return to Selection mode by pressing A. Select the “Umm” clip, and press Shift-Delete (or backspace) to perform a ripple delete.



- 11 With your playhead over the new edit point, press / (slash) to play the edit. You're aiming to have this audio edit be as inconspicuous as possible. When you play around the current edit, try listening to the cut without watching the picture. Does it sound as if an edit is there? If it does, you'll need to do a little finessing, which you'll be looking at soon.

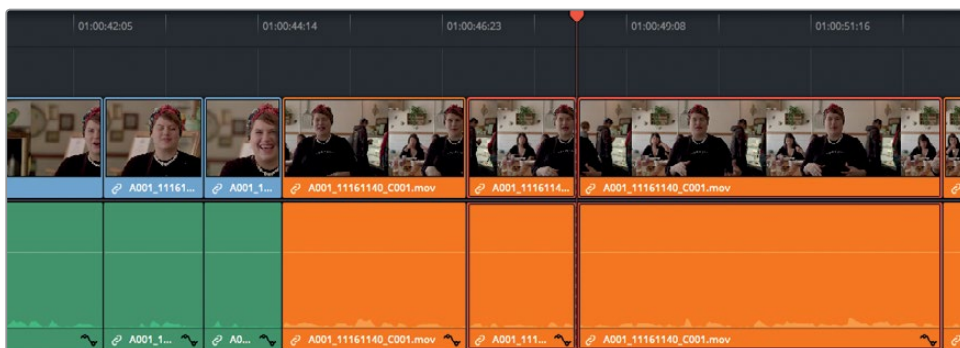
TIP When you perform an edit, you can't know how successful it's going to be until you playback your timeline. It's highly doubtful if things are perfect straightaway (though happy editing accidents have been known to occur). In reality, most edits you'll perform will always need to be improved with a few trims here and there.

Continue playing what is now the second orange interview clip until you hear the next problem where she says, “We're taking dishes and flavors.” She stutters and says the word “and” twice. It's a simple task to tidy this up.

- 12 Press the JKL keys to play forward and backward over the clip, finally positioning the playhead just before the first “and”.

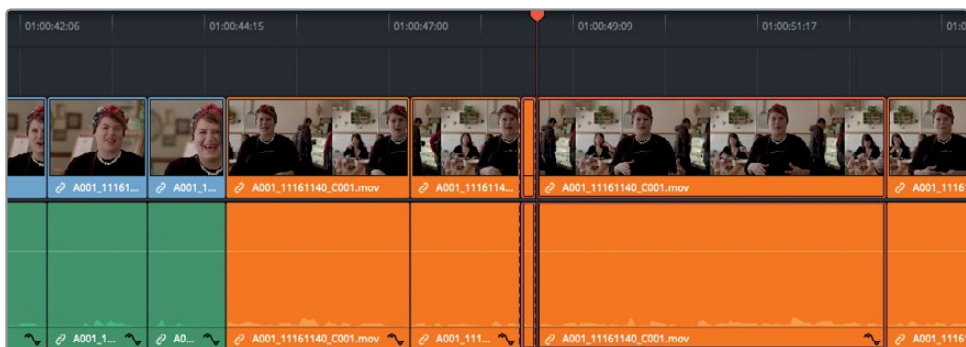
TIP Remember that you can jog the playhead back and forth by holding down the K key and tapping the L or J key. It's also useful to have audio scrubbing turned on so you can hear the starts or ends of words. Choose Timeline > Audio Scrubbing, or press Shift-S, to toggle audio scrubbing on and off.

- 13 Press Shift-V to select the clip under the playhead.
 14 Press Cmd-B (macOS) or Ctrl-B (Windows) to add a through edit to the selected clips.



TIP Pressing this keyboard shortcut adds an edit point to a selected clip or clips at the playhead position. It's a little more precise than clicking to add a cut in razor edit mode.

- 15 Jog forward until the playhead is located before she says the second “and.” Press Cmd-B (macOS) or Ctrl-B (Windows) again to add a second through edit.



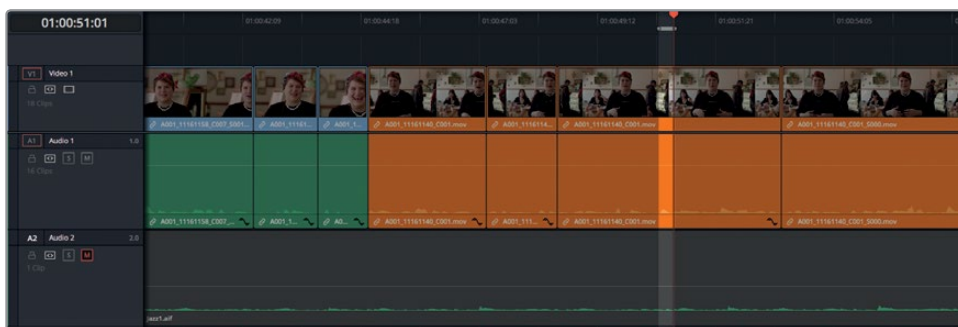
- 16 Move your playhead over the isolated “and” in the timeline. Press Shift-V to ensure that the clip is selected, and press Shift-Delete (or backspace) to ripple delete the clip.
- 17 Press / (slash) to play around the new edit.

Again, try listening to the edit without looking at the jump cut you’ve just created. Remember, you’re trying to create a natural-sounding interview that won’t distract the audience. Don’t worry if the current edit is not as smooth as you would like; you’ll finesse it soon.

Keep playing through the interview. The next portion you’re going to remove is the “Umm” just after she says “textures.” This time you’re going to place timeline in and out points to remove this unwanted portion of the interview.

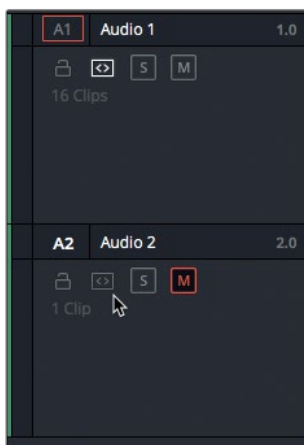
- 18 In the timeline, place your playhead at the start of the “Umm,” and press I to add an in point.
- 19 Jog the playhead forward six or seven frames until you hear her start to say, “and really making them.” Press O to set an out point just before she says, “and.”

TIP Because Resolve’s playhead is inclusive of the current frame, in points are always added to the head of the frame and out points are added to the tail of the frame. When adding out points, it’s often useful to find the frame you want to keep (usually at the start of the next word) and then move the playhead one frame back before adding the out point. By doing so, you’ll be sure to keep the frame you wanted.

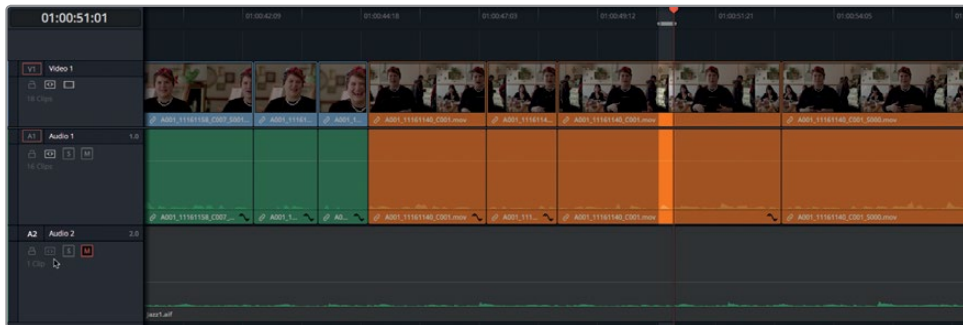


You’ve now set in and out points around the portion of the interview you want to remove. But notice that the highlighted portion of the timeline also includes the music on Audio 2, even though this track is muted.

- 20 In Audio 2, click the Auto Select button to disable the function, or press Command-Option-F2 (macOS) or Control-Alt-F2 (Windows).



By turning off the auto-select control for Audio 2, you'll notice that the highlighted section no longer covers the music clip, so it will not be included in the next step.



- 21 Press Shift-Delete (or backspace) to ripple delete the contents between the in and out points in the timeline, and on tracks with auto select enabled.
- 22 Press / (slash) to preview your new edit.

For a little extra credit, the director has also asked if you could tidy up the end of the orange clip; she doesn't like the interviewee's use of the word "palatable" to describe the food. This is a slightly more subjective cut; but when trying to put together the best description of the food at the restaurant, it may be desirable to aim higher than simply "palatable." Do you think you'd be able to edit out the words "palatable and" so that she simply says, "making them delicious"?

Trimming using Keyboard Shortcuts

Resolve 15 has very complete roll, ripple, slip, and slide trim commands that you can perform using the mouse. However, when you're making small, subtle changes to an edit - often adding or removing single frames - it's useful to perform most of your trimming using keyboard commands. In doing so, you'll exercise the most precise control over each of your edits. Learning how to get the best from Resolve's trimming options is an important step in choosing the best technique for any given situation.

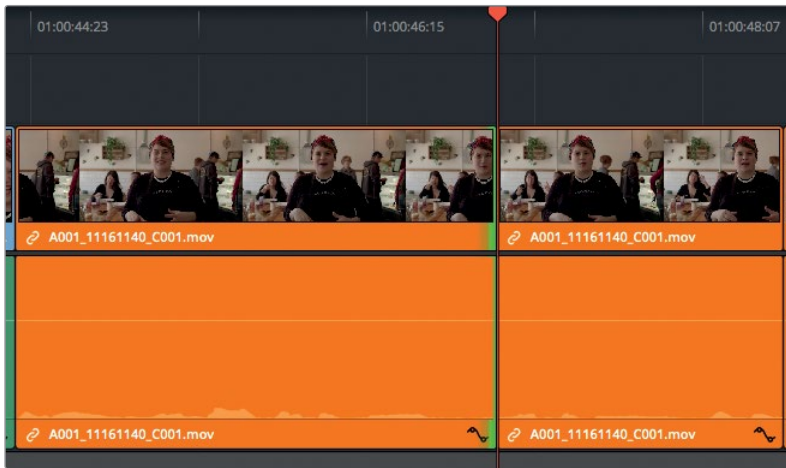
In the next exercise you'll exclusively use keyboard shortcuts to move and select the cut points you need to trim.

- 1 Position the playhead at the start of the orange clips.
- 2 Press the down arrow to go to the first cut in that clip.
- 3 Press / (slash) to preview the edit.

Listen closely to the audio edit you created in the previous steps. Does it sound like a natural, continual part of her speech pattern? Identifying how to adjust the edit effectively, whether to add or remove frames from either the outgoing or incoming clips, is a skill that will only come with practice.

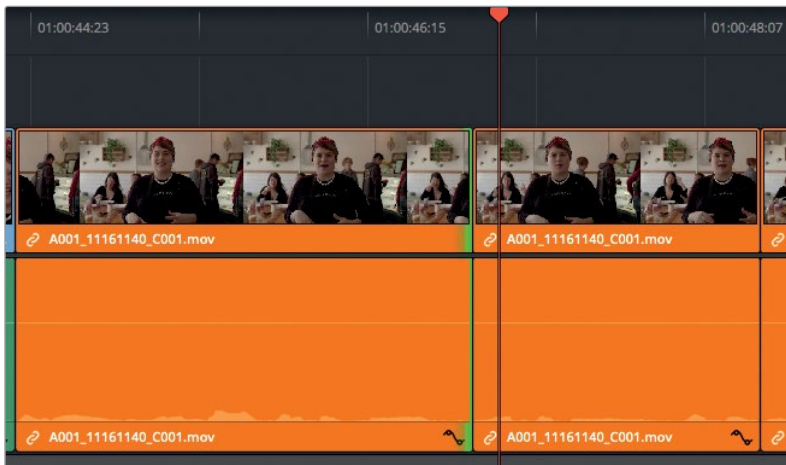
- 4 Press T to enter trim mode.

- 5 Press V to select the cut for trimming. Then press the U key until only the outgoing (left) side of the cut is selected for ripple trimming.



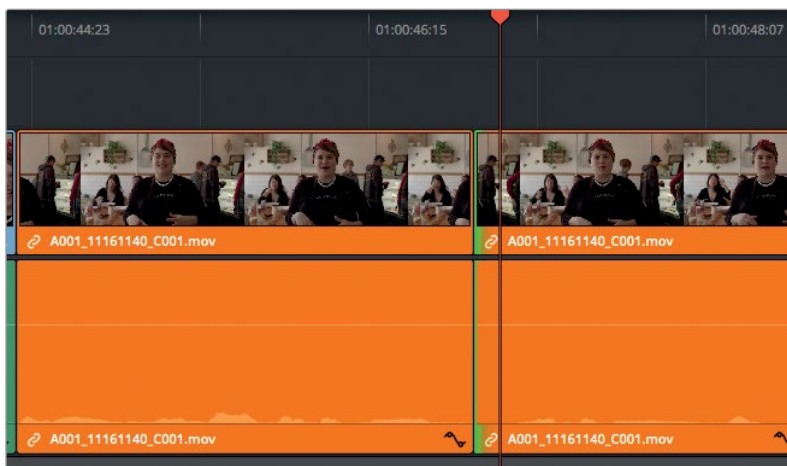
TIP Press V to select the edit point nearest the playhead on the highest auto select-enabled track; and press U to toggle between the trim operations for the currently selected editing mode.

- 6 Press , (comma) to trim the selected edit one frame to the left or . (period) to trim it one frame to the right.



TIP Because you're concentrating on the audio in these clips, it's useful to keep an eye on the clip waveforms to see if you're adding or removing parts of words.

- 7 If necessary, press U twice to change the trim to the head of the incoming shot, and press , (comma) or . (period) to add or remove frames.

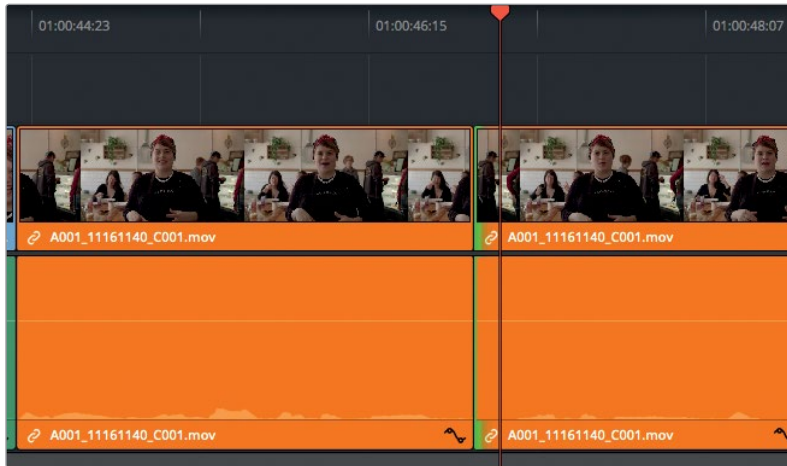


- 8 Press / (slash) to play around the cut point and check your trim decision.

TIP Press Shift-, (comma) or Shift-. (period) to perform a nudge operation that trims multiple frames at once. The default value is five frames, but you can change this value by going to DaVinci Resolve > Preferences, selecting User settings, and adjusting the Pre-roll and Post-Roll times in the Editing panel.

Continue to refine the edit until you are happy with the results. Then you can move on to the next cut.

- 9 Press the down arrow to go to the next cut in your timeline. This edit is selected in the direction you last had the previous edit selected.



- 10 Press / (slash) to play around the cut point and to determine what you need to trim.
- 11 Decide if the edit needs to be refined or not, and press U to change to the appropriate trimming operation.
- 12 Press the , (comma) or . (period) keys to refine the edit, adding or removing frames from either the tail of the outgoing clip or the head of the incoming clip.
- 13 Press / (slash) to review your trim.

When the audio edit sounds good, move on to the next cut.
- 14 Press the down arrow to go to the next cut in that clip.
- 15 Press / (slash) to play around the cut point and identify what you need to trim.
- 16 Press U to toggle the edit direction, and press , (comma) and/or . (period) to refine the edit.
- 17 Press / (slash) to review your trimming.
- 18 When you have finished, press A to exit trim mode and return to the selection tool.

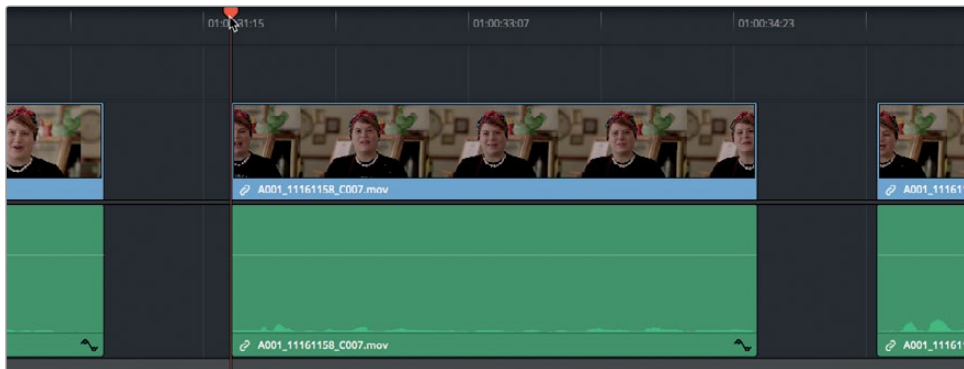
You have refined a small part of this interview using various techniques to remove unwanted parts of what the subject says and refining the rest into a succinct description of her business. When chipping away at a longer cut with the goal of making it shorter, these keyboard-oriented trim commands enable you to see and hear a trim as you make it which can be invaluable!

Feel free to keep on practicing on the two additional orange clips in this timeline.

Editing Subframe Audio

While video trimming is limited to a project's framerate (24 fps, in this project), audio is captured using tens of thousands of samples each second. DaVinci Resolve includes the ability to edit audio at this subframe level which enables a much more detailed ability to trim. Access to subframe audio editing means that you can separate subtle syllables or words that are slurred and make them sound clean and clearer. Let's use subframe audio editing to smooth some of the dialogue that you just trimmed in the radio edit.

- 1 Place the playhead over the start of the clip after the first gap in this timeline (clip **A001_11161158_C007.mov** at 01:00:31:20).

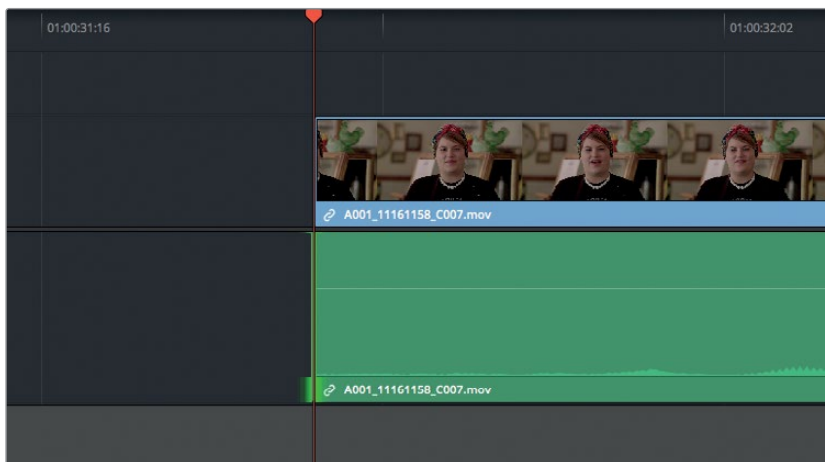


- 2 Press / (slash) to play over the cut.
Listen carefully and you'll hear a portion of the previous word, "and," before she continues with, "We have our vegan macaroni and cheese."
- 3 To access subframe audio editing, press N to disable snapping and press Shift-Cmd-L (macOS) or Shift-Ctrl-L (Windows) to turn off linked selection.



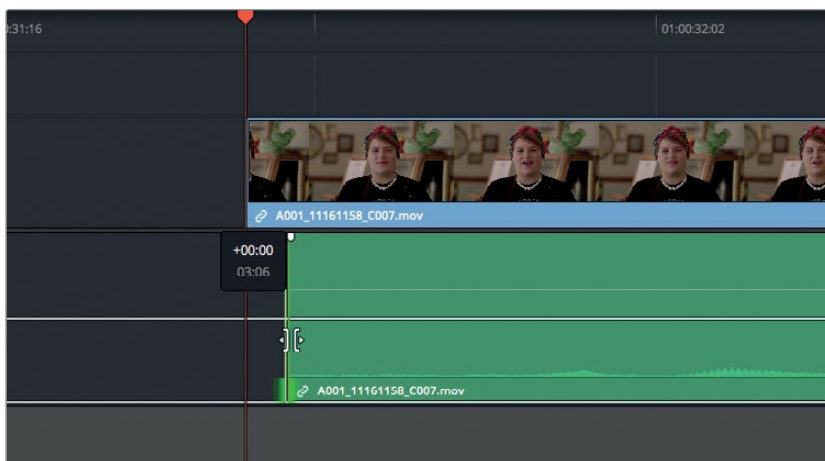
- 4 Enable the selection tool by pressing A.
- 5 To select the cut for trimming, press V, and then press Option-U (macOS) or Alt-U (Windows) until only the audio track is selected.

- 6 Press Cmd-= (equals sign) in macOS or Ctrl-= (equals sign) in Windows several times to zoom into the timeline as far as you can go.



Remember, because you are trimming subframes, you need to zoom in to see more detail.

- 7 Press the U key until both sides of the audio cut are selected.



The tool tip tells you that you're not trimming off any frames, because the portion of the audio you are trimming is within the duration of a video frame.

- 8 Drag the audio cut to the right and find a location where you get the cleanest transition in to "we" without hearing any of the "and." Make sure you don't take off so much that you lose the start of "we."
- 9 Press / (slash) to play around the selected cut and hear your cleaner edit.

- When you are happy with your trimming, reenabling snapping and linked selection in the timeline.

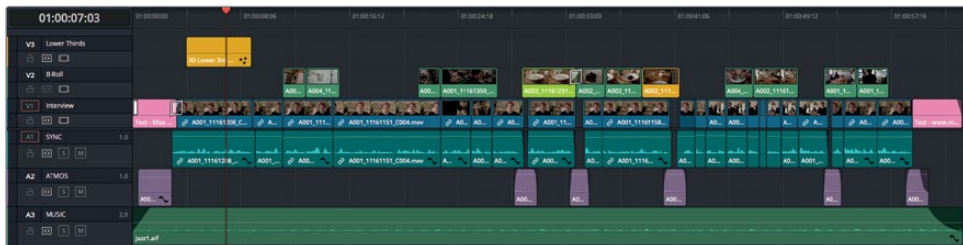
Now that you've trimmed the audio in your project at the subframe level, you've learned how to apply a greater degree of audio control.

Continue refining this timeline, practicing the techniques you've learned so far in this lesson. When your radio edit is finished, you're ready to add the paint, or b-roll, to cover holes and visual jump cuts. That said, you can still apply plenty of tricks to help massage the footage into the exact shape you want and make your story as engaging as possible.

Creating Variable Speed Changes

Changing the speed within a clip can grab the audience's attention by turning what can be an ordinary clip into something that makes people sit up and take notice. That is especially true on the somewhat pedestrian food shots. In Resolve 15, you'll find many advanced controls to manipulate the playback speed of clips. One of these tools, the retime controls, enables you to apply multiple speed changes to the same clip without splitting the clip into multiple cuts. Such speed changes are commonly as speed ramps. To explore these techniques, you'll use a timeline that has some b-roll clips added to the project.

- In the timelines bin, double-click "02 Radio Edit with B-Roll" to load it into the timeline window.



- Choose Workspace > Reset UI Layout to reset the timeline to its default size.
- Play the timeline to review the edit.

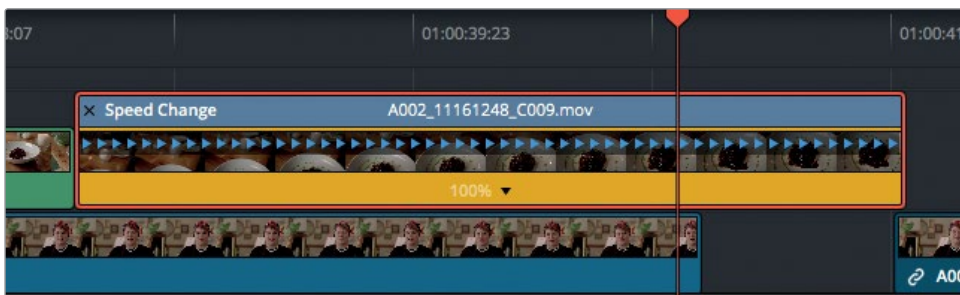
Notice how the new b-roll clips illustrate what Miss Rachel is talking about, as well as hiding most of the jump cuts and gaps created during the radio edit. Note also the sound of the restaurant added on the Audio 2 track (with the music having been dropped to Audio 3) to fill in the sound gaps between the interview clips.

- In the timeline, go to the yellow clip on the B-Roll track, which starts at around 01:00:39:00.



This shot of the barbecued seitan would be nicer if it slowed down as the plate came closer. Right now, the entire shot moves too fast.

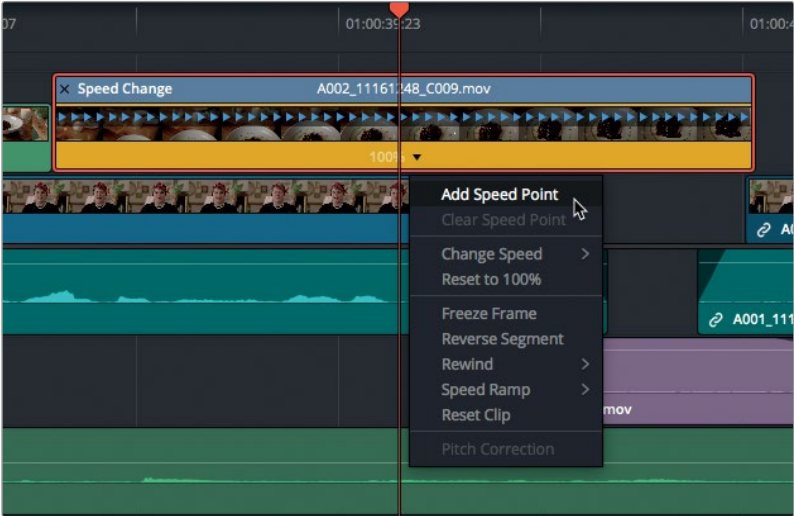
- 5 Press Cmd++ (plus sign) in macOS or Ctrl++ (plus sign) in Windows to zoom into the clip on the timeline.
- 6 Right-click the clip and choose Retime Controls, or press Cmd-R (macOS) or Ctrl-R (Windows).



A blue bar appears along the top of the clip with the speed percentage of the clip displayed underneath the video thumbnails.

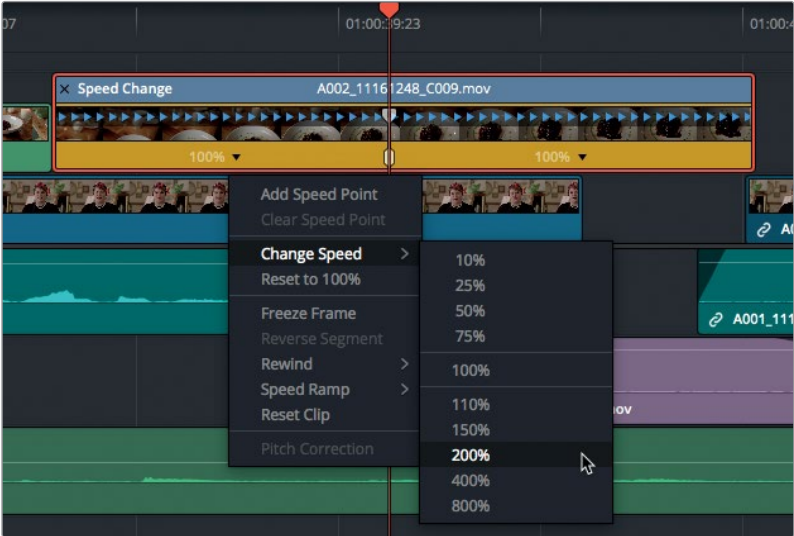
- 7 Place the playhead about halfway into the duration of the clip.
This is the location where you would like to start slowing down the clip playback. You do so by adding a speed point at the playhead location.

- 8 Along the bottom of the clip, click the disclosure arrow to the right of the speed percentage display, and choose Add Speed Point.

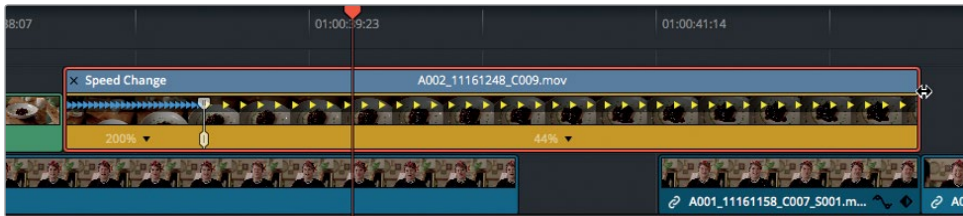


The speed point divides the clip into two sections, with each section now having its own playback speed. You can set the speed in the menu you used to set this speed point. Let's increase the speed slightly for the first half of the clip, and then slow it down for the second half.

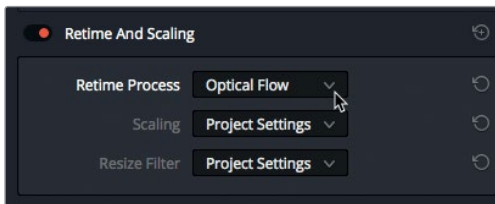
- 9 Click the disclosure arrow for the segment on the left and choose Change Speed > 200%.



- 10 Position your mouse pointer on the right edge of the Speed Change bar, and when the pointer changes to a double arrow, can drag the edge of the clip to the point where she laughs. Doing so reduces the speed even further and better covers the jump cut.



- 11 Play over the speed change to view the results. You now have an eye-catching shot that feels more contemporary and engaging than the straight food shot you had. Unfortunately, the slow parts of the footage now appear a little stuttery because Resolve has to repeat frames to create that speed change.
- 12 Select the clip in the timeline, and open the Inspector. In the Retime and Scaling controls, change Retime Process from Project settings to Optical Flow.

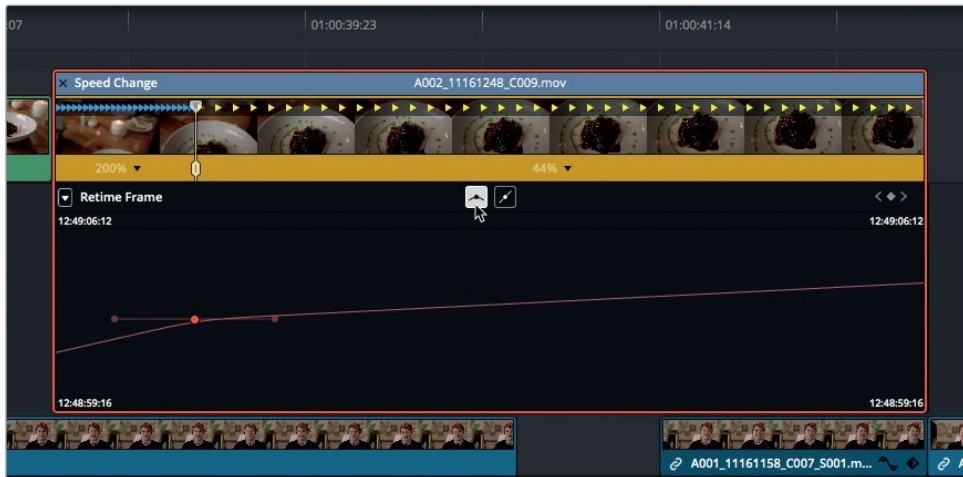


TIP Optical Flow is an intensive process whereby Resolve examines the movement of pixels from one frame to another and attempts to interpolate that information to create new frames.

- 13 Finally, to smooth the transition between the two speed sections, right-click the clip in the timeline, and choose Retime Curve, or press Shift-C.

The retime curve opens in the timeline below the clip.

- 14 In the retime curve, select the retime keyframe, and click the Bezier control. Drag the handles out to adjust the amount of smoothing applied to the speed change.



- 15 Finally, click the retime curve icon on the clip to hide the retime curve, or press Shift-C. Right click the clip, and choose Retime Controls, or press Cmd-R (macOS) or Ctrl-R (Windows) to hide the retime controls.

This food shot in your timeline is now much more dynamic and exciting. You've also easily manipulated a moving shot to increase its impact and help cover the jump cuts in the interview edit.

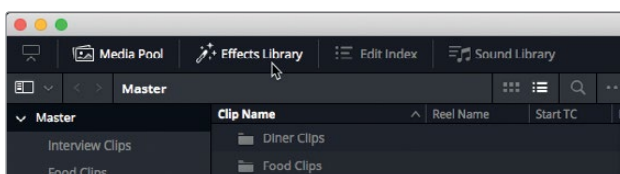
Using Smooth Cut

Another way to hide a jump cut from your viewer is to use the Smooth Cut transition.

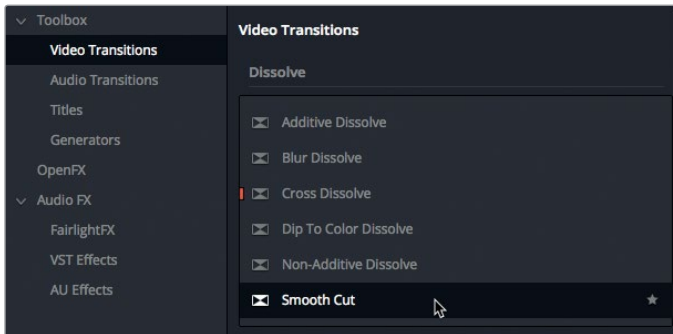
- 1 In the timeline, place your playhead over the edit between the first and second interview clips, just after the lower-third title has faded away (at around 01:00:09:00). Press / (slash) to preview the cut.

This is a classic jump cut that distracts from the story about the merits of this vegan restaurant.

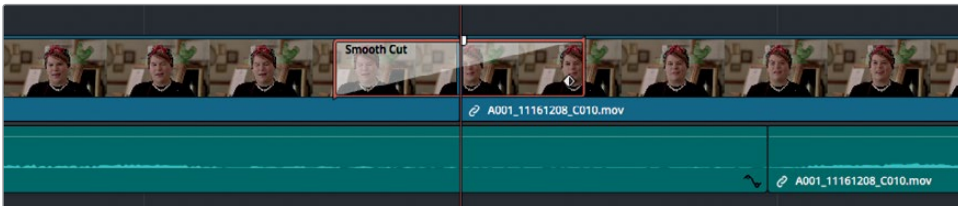
- 2 In the upper-left of the interface, click the Effects Library button to open your Effects Library.



- 3 Click the Video Transitions group, and in the Dissolve category, locate Smooth Cut.



- 4 Drag the Smooth Cut transition to the edit point between the first and second interview clips so it's centered across the edit.
- 5 Set the duration of the transition to four frames by either dragging the edges of the transition in the timeline, or typing 4 in the Duration field of the Inspector.



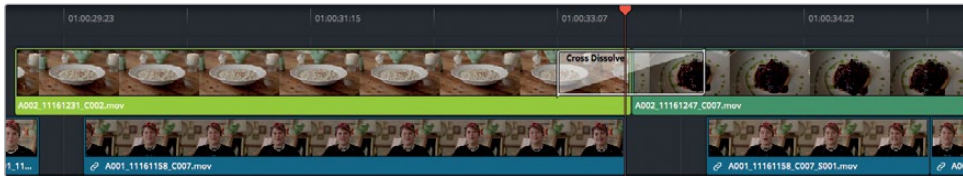
You should see that Resolve successfully manages to blend the two sides of the jump cut into what appears to be a single take.

Remember, though, that you should use this transition with great care; you don't want to change or misrepresent the meaning of something your interviewee said through your editing, no matter how subtly!

Working with Advanced Transition Tools

Transitions in Resolve are very straightforward to use. But they also allow you to go much deeper into transition customization than you might have thought possible. Resolve has a built-in curve editor for transitions that enables you to customize the acceleration of any transition animation. Let's create one for your radio edit.

- 1 Go to the lime green clip on the V2 B-Roll track at around 01:00:33:00.

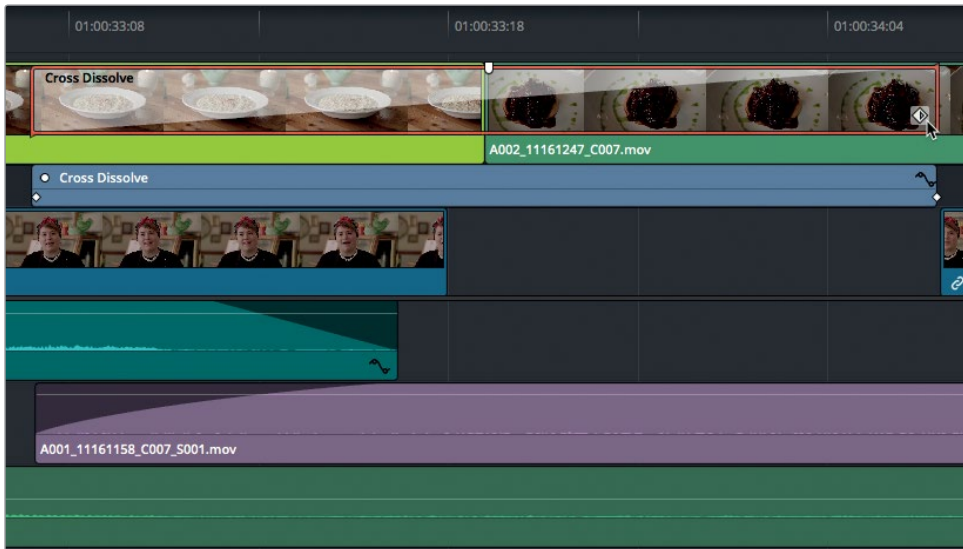


This is the shot of macaroni and cheese in the middle of your timeline.

- 2 Play over the cross dissolve transition at the end of this clip.

The transition works well, but the incoming shot takes a few frames before the camera motion settles down. If you ease out on the transition, it will fade into the incoming shot more slowly, thereby reducing the impact of the camera movement at the start of the clip. You can address this by creating a custom ease-out using the transition curve editor.

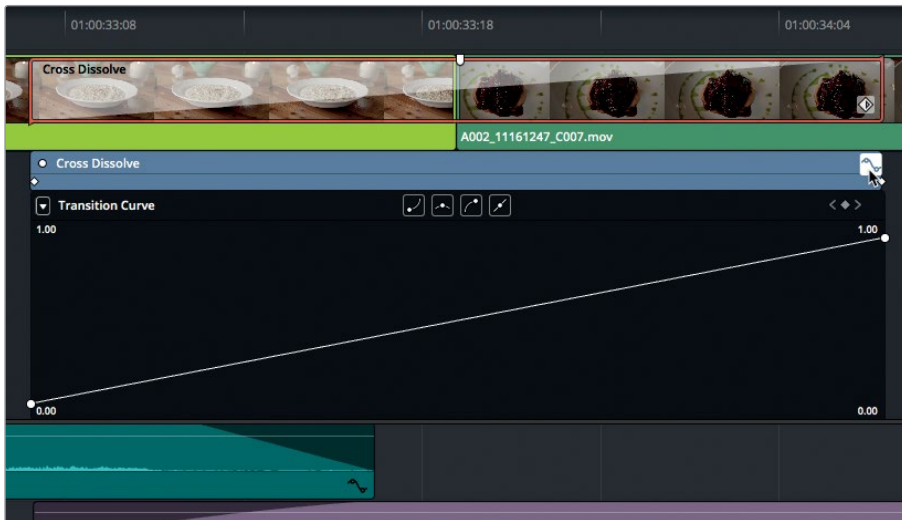
- 3 Select the transition, and in the lower-right corner of the transition, click the diamond icon to open the keyframe editor.



TIP If you can't see the diamond icon on your transition, zoom further in in your timeline.

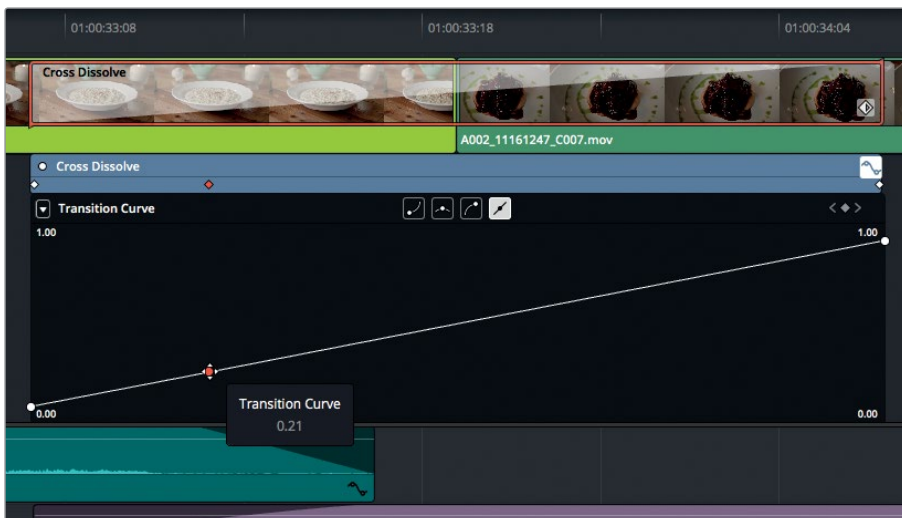
If you just wanted to move a keyframe earlier or later, you could use this editor. However, to create a custom acceleration curve, you must use the curve editor.

- 4 On the right side of the keyframe editor that appears below the clip, click the curve editor icon to open the transition curve editor.

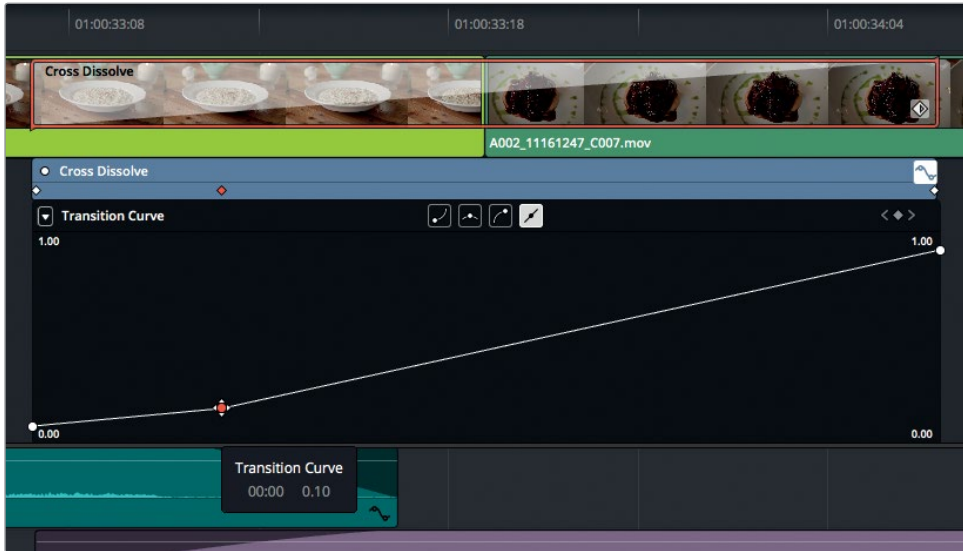


Instead of making numeric adjustments to your transition in the Inspector, you change the slope of the curve in this curve editor to change the transition acceleration. The default linear transition is a diagonal line from the lower-left to the upper-right. However, you can flatten that line's slope to slow the transition speed. To slow down the curve at the start, you can add a control point along the line and decrease the slope between the initial control point on the left and the new control point you add.

- 5 Option-click (macOS) or Alt-click (Windows) about one-third of the way along the diagonal line to create a control point.



- 6 Drag down the new control point until the Transition Curve tool tip reads 0.10.

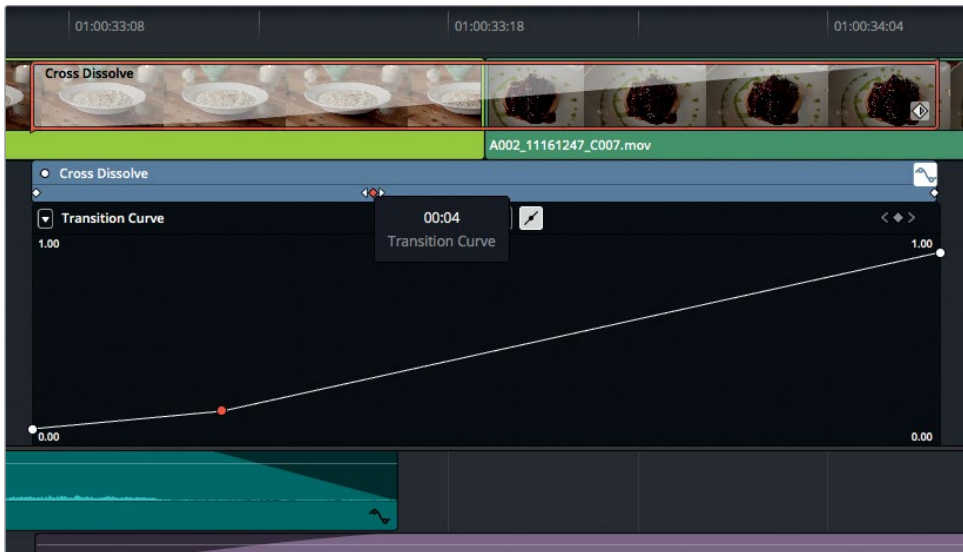


This setting indicates that at this keyframe, the transition will be only 10% complete.

- 7 Press / (slash) to play around the selected transition and view the results.

If the acceleration isn't hiding enough of the slow camera start at the beginning of the clip, you can move the control point horizontally to change the timing.

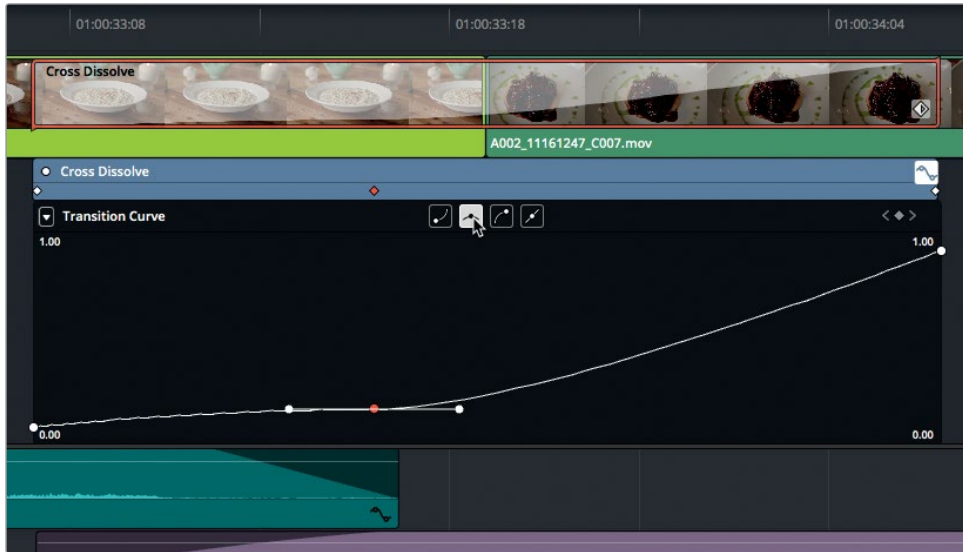
- 8 In the keyframe editor track, drag the control point to the right until it is almost in the middle of the clip to lengthen the slow acceleration.



- 9 Press / (slash) to play around the selected transition.

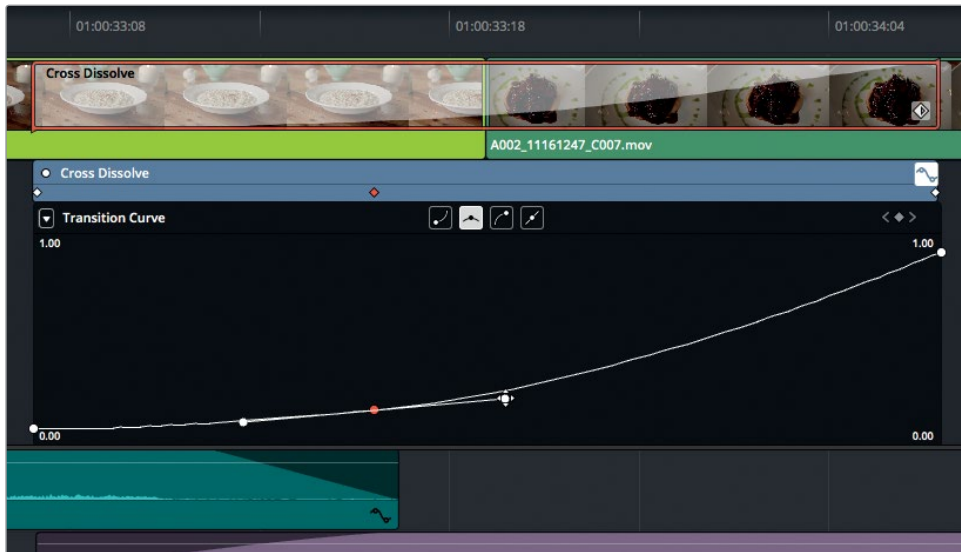
Although you delayed the acceleration, a very linear transition remains between the control points. You can smooth these transitions using the interpolation buttons at the top of the curve editor.

- 10 Select the center control point that you added. It turns red.
- 11 Click the second interpolation button from the left to create an ease-in/ease-out interpolation for the control point and to display Bézier handles that will allow you to perform further refinement.



Because the Bézier handles are almost completely horizontal when added, they will create a pause in the transition, holding it for just a moment. However, that's not what you want so you'll need to adjust the handle to accentuate the slow acceleration at the start of the clip.

- 12 Drag the right Bézier handle slightly up and to the right to create a smoother curve.



- 13 Press / (slash) to play around the selected transition.
- 14 If you are happy with the results, you can close the curve editor by clicking the curve editor button in the upper-right corner of the graph. Then, click the diamond shaped keyframe editor button in the lower-right corner of the transition icon in the timeline to close the keyframe editor.

Custom transitions such as this are most often used in very specific situations, but you can also save them as presets if you anticipate the need to reuse a custom curve transition in the future.

Lesson Review

- 1 What is known as a “radio edit”?
 - A) When your edit will be used on radio as well as television
 - B) A cut-down version of your film used by reviewers
 - C) A technique of concentrating on the audio before editing the visuals

- 2 What does an edit point with a dotted line represent in the timeline?
 - A) A back-timed edit
 - B) A through edit
 - C) An edit that needs a transition applied

- 3 Which retiming process can produce much smoother results by restructuring the visual data between frames of footage?
 - A) Stereoscopic
 - B) Optical flow
 - C) Frame blend

- 4 What transition could be used to make short jump cuts less noticeable?
 - A) Smooth wipe
 - B) Smooth dissolve
 - C) Smooth cut

- 5 How can you access the advanced transition controls?
 - A) Right-click the transition in the timeline, and choose Advanced Transition Controls
 - B) Click the Transition’s keyframe button, and click the curve editor button
 - C) Click the transition’s curve editor button in the Inspector.

Answers

- 1 C. A “radio edit” is created when you focus on editing the audio of an interview to make it sound smooth and natural before turning your attention to the covering visuals.
- 2 B. A through edit—where you have an edit on a clip but haven’t removed any frames—is represented as an edit point with a dotted line.
- 3 B. Optical flow uses motion estimation to generate new frames from the original source frames to produce exceptionally smooth results when retiming a clip with linear motion.
- 4 C. Smooth cut is a special-purpose transition designed to make short jump cuts less noticeable by using optical flow processing to automatically morph a subject between to positions across the duration of the transition.
- 5 B. To reveal the Transition Curve editor, click the keyframe diamond in the lower-right corner of the transition to display the Keyframe Editor, and then click the curve editor button.

Lesson 5

Editing an Action Scene

Some of the most enjoyable editing jobs are cutting action scenes. Although action scenes don't come along every day for most editors, the techniques for cutting such scenes can be valuable when editing sports, dance, and other movement-oriented footage.

As editor, it is up to you to create the overall rhythm and flow of the action. You can do so with the number and variety of the cuts you use, and the duration of the shots. Choosing multiple angles, cutting on action, speed ramping, judiciously removing frames, and inserting the right reaction shots will all heighten the excitement.

In this lesson, you'll edit, trim, reframe, and retime clips in DaVinci Resolve 15 to create a highly impactful fight sequence.

Time

This lesson takes approximately 60 minutes to complete.

Goals

Starting a Dailies Timeline	140
Using Tabbed and Stacked Timelines	142
Cutting on Action	147
Enhancing the Action	153
Comparing Timeline Versions	166
Lesson Review	169

Starting a Dailies Timeline

It is easy to import all your action dailies and then wonder where to start, but don't let a big fight scene overwhelm you. Begin by making a dailies reel and marking all the best moments. Once you're done, you will be able to quickly assemble a cut.

- 1 In the Project manager, right-click and choose Import. Navigate to R15 Editing 201 > Lessons > Lesson 05 Action. Select R15 Editing Lesson 05 Action.drp, choose Open, and click OK to import the project into your Project manager.

- 2 Open the project, and relink media files.

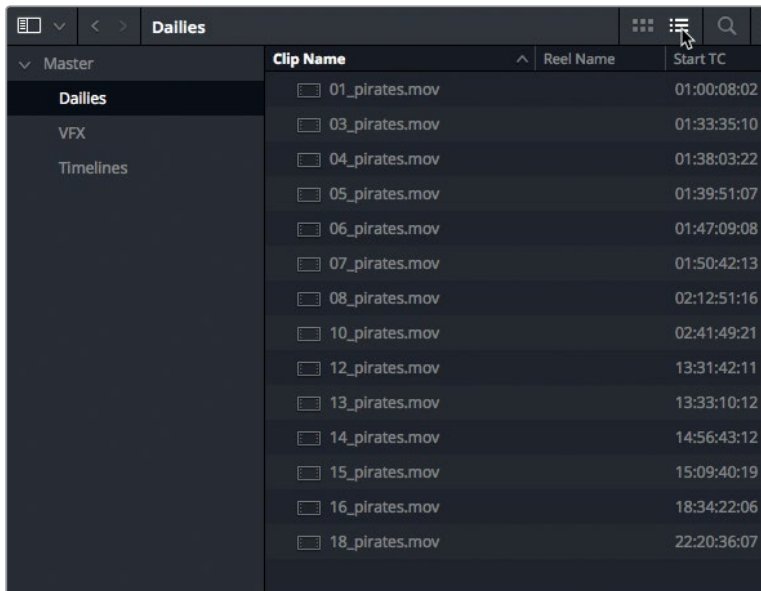
This project includes a timeline with a version of the fight scene already cut.

- 3 Move the playhead to the start of the timeline, and click play to review the edit.

Overall, the director is happy with the general flow of the fight; but he would like to try re-cutting the scene to give it a bit more impact, as well as experimenting with different reaction shots. While you could immediately duplicate the original timeline and start refining the edit, let's first consider other ways of working between different timelines.

- 4 In the Media pool, select the Dailies bin, and click the list view button.

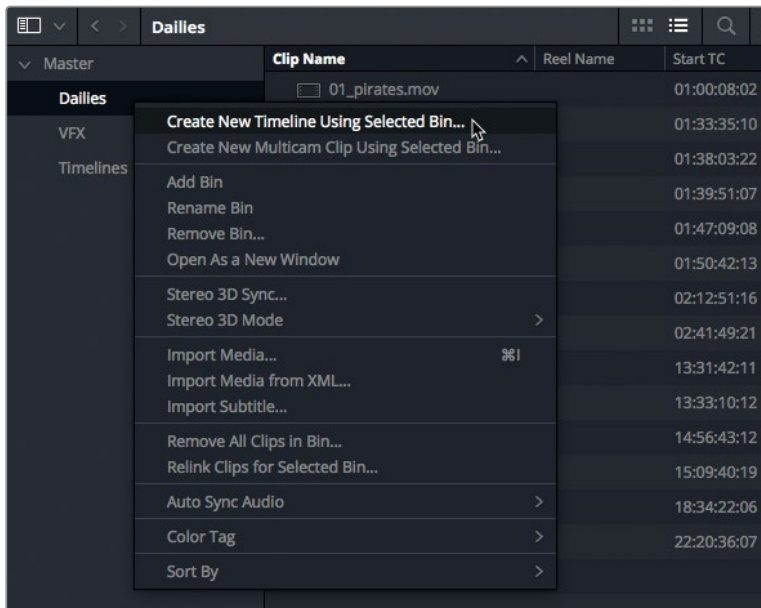
- 5 Click the Start TC column to place the clips in ascending order.



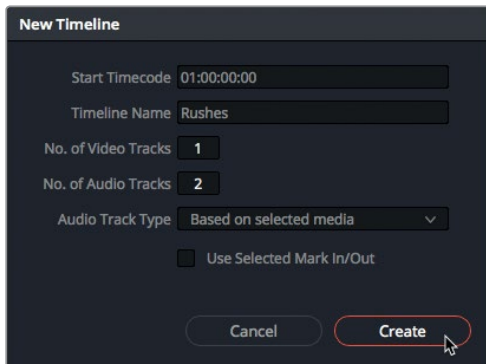
Clip Name	Reel Name	Start TC
01_pirates.mov		01:00:08:02
03_pirates.mov		01:33:35:10
04_pirates.mov		01:38:03:22
05_pirates.mov		01:39:51:07
06_pirates.mov		01:47:09:08
07_pirates.mov		01:50:42:13
08_pirates.mov		02:12:51:16
10_pirates.mov		02:41:49:21
12_pirates.mov		13:31:42:11
13_pirates.mov		13:33:10:12
14_pirates.mov		14:56:43:12
15_pirates.mov		15:09:40:19
16_pirates.mov		18:34:22:06
18_pirates.mov		22:20:36:07

Each clip now appears in the order it was shot. This will be helpful moving forward because all of the shots from a single camera setup (meaning, all the different takes) will usually be located next to each other which will make them easier to find. You can go one step further and place all of the clips in a timeline using this sort order.

- 6 Right-click the Dailies bin, and choose New Timeline Using Selected Bins.



- 7 Name the timeline **Rushes**.
- 8 Change the “No. of Audio Tracks” to 2 to reflect the audio clip attributes of the source clips.
- 9 Deselect “Use Selected Mark In/Out”.



- 10 Click Create.
The Rushes timeline is created in the Dailies bin and opens in the timeline window.

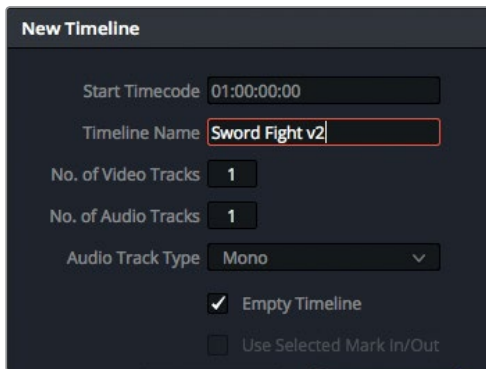
- 11 Press Shift-Z to view the entire Rushes timeline.

The clips in the Dailies bin are now placed into the timeline based on the bin’s sort order. You also chose not to use the existing in and out points applied to each clip to ensure you’re seeing the full duration of each take.

Using Tabbed and Stacked Timelines

You can use this Rushes timeline as a source clip because doing so is easier than loading each clip separately while looking for alternative takes. To start, let's create a new timeline that will be your new fight scene rough cut. The first cut should contain everything you want to happen at roughly the right time. This process isn't about finessing anything; it is all about laying the groundwork.

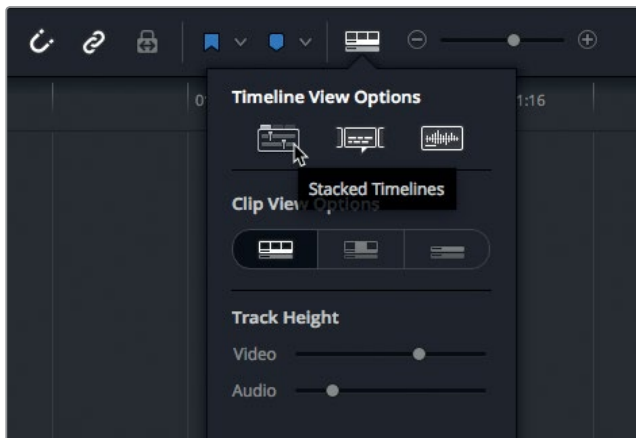
- 1 Select the timelines bin, and choose File > New Timeline. Name it **Sword Fight v2**.
- 2 Change the Audio Track Type to Mono because the source audio you'll be using includes only mono channels.



- 3 Click Create.

You want to be able to edit one source timeline into another timeline. To do so, it's often easier to see more than one timeline at the same time.

- 4 Select the Timeline View Options, and choose the first option to enable Stacked Timelines.



The timeline window now shows the two timelines you've opened in separate tabs. You can select each tab to view the contents of that timeline.

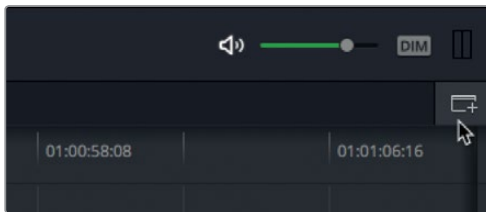
TIP You can open more tabs by clicking the + (plus sign) button to the right of your timeline tabs, and close existing tabs by clicking the X next to the name of each tabbed timeline. You can also drag timeline tabs horizontally to change their order.

- 5 In the pop-up menu for the Sword Fight v2 timeline tab, choose the Ruses timeline.



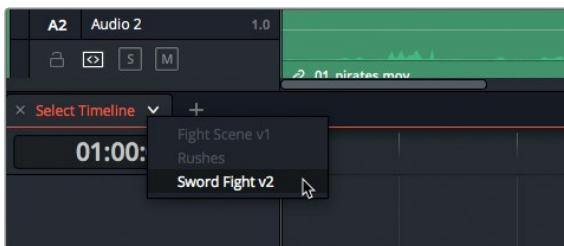
You can also see different timelines at the same time by viewing stacked timelines.

- 6 In the upper-right corner of the timeline, click the new stacked timeline button.



A second, tabbed timeline window appears below your original timeline.

- 7 In the lower timeline window, in the pop-up menu on the empty timeline tab and choose the Sword Fight v2 timeline.



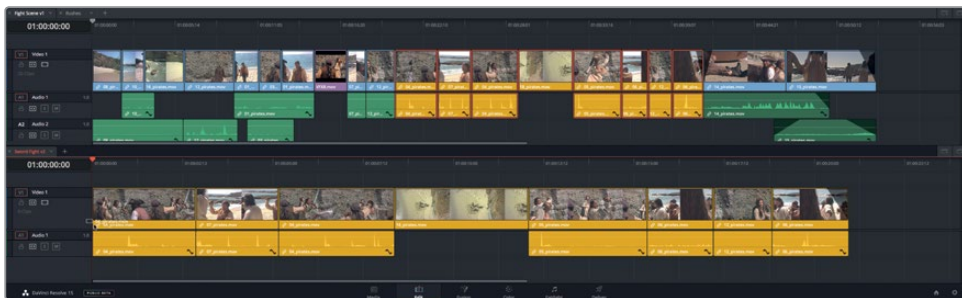
You can now see the contents of the Ruses timeline and the Sword Fight v2 timeline simultaneously. Let's clean up the interface a little so you can concentrate on this scene.

- 8 Click the Media pool button to hide the Media pool.
- 9 Click in the upper-right corner of the Timeline Viewer to enter single viewer mode.
- 10 Click the tab for the Fight Scene v1 timeline, and press Shift-Z to view the entire timeline in its tabbed window.

You are now ready to create an alternative, tighter cut of this fight scene.

- 11 In the Fight Scene v1 timeline, select all the yellow clips that make up the main fight sequence.
- 12 Drag the selected clips into the empty Sword Fight v2 timeline (in the lower timeline window.)

The selected clips are copied from one timeline into the other.



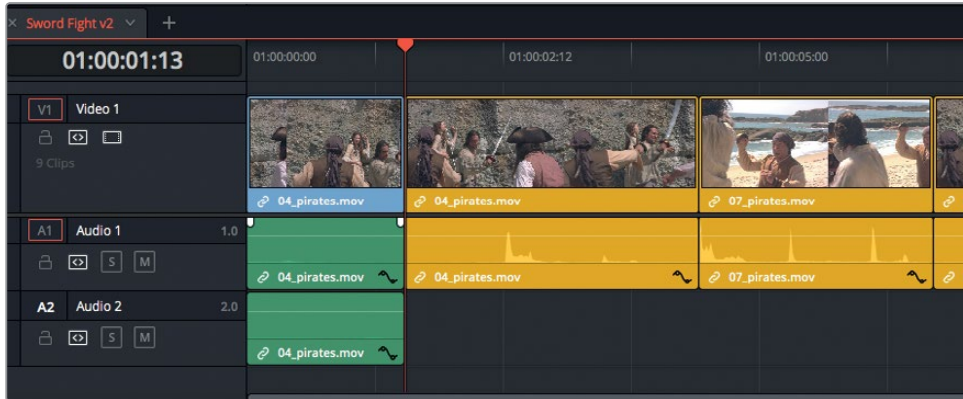
- 13 Press Shift-Z to view the newly edited contents in the Sword Fight v2 timeline.
You can also edit between timelines using a variation of the three-point editing technique.
- 14 In the upper timeline window, click the Rushes timeline tab .
- 15 Move your playhead to the start of the third clip in this timeline, **04_pirates.mov**.
- 16 Play through the clip and set an in point where the hero jumps in for the second time.



- 17 Type **+112** to move the playhead forward by one and a half seconds and add an out point.
- 18 Choose Edit > Copy to copy the select portion of the Rushes timeline.

- 19 Click in the Sword Fight v2 timeline window, and ensuring your playhead is at the start of this timeline, choose Edit > Paste Insert.

The copied portion of the Rushes timeline is inserted into the Sword Fight timeline and it effectively establishes the start of the fight scene. Now you'll insert a quick reaction shot of the female lead.



- 20 In the Rushes timeline, move the playhead to **13_pirates.mov** and play through the reaction shots of the heroine.

Because the hero has just jumped into the frame, let's cut in a surprised reaction from her.

- 21 Set an in point where the woman gasps at 00:05:46:00.

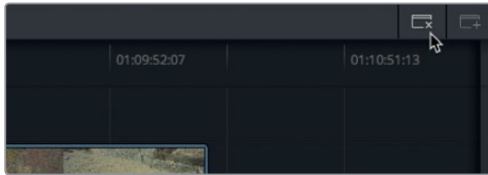


TIP This timecode value is for the Rushes timeline. To see the original source timecode for each clip right-click the timeline viewer timecode box, and choose Source Timecode.

- 22 Type **+4.** (plus sign, 4, period) to move the playhead forward four seconds, and add an out point after the woman turns from looking up.
- 23 Press Option-/ (slash) in macOS or Alt-/ (slash) in Windows to play between the in and out points.

This four-second range has a good reaction from the actress. She jumps, apparently in response to the swashbuckler jumping in from somewhere, and then she looks up to the right, as if to figure out where he came from. This is a perfect reaction for your cut.

- 24 Press Cmd-C (macOS) or Ctrl-C (Windows) to copy the marked section.
- 25 Select the Sword Fight v2 timeline.
- 26 Ensure that your playhead is at the edit point between the first and second clips.
- 27 Press Shift-Cmd-V (macOS) or Shift-Ctrl-V (Windows) to paste insert the copied clip into the timeline.
- 28 In the upper timeline window, click the close timeline window button to leave just the Sword Fight v2 timeline open.



By utilizing Resolve's tabbed and stacked timeline views, you can easily edit the contents between different timelines. By using this technique, you have created separate versions of these clips in your new timeline that you can trim and adjust without disrupting or changing your original edits.

Editing from a Source Timeline

Another technique favored by many editors is to open the timeline of rushes in the Source Viewer, mark the appropriate part of the footage and edit as normal using overwrite, insert, etc. You can achieve this in DaVinci Resolve by dragging a timeline into the source viewer. When editing in this manner you may want to enable **Edit > Decompose Compound Clips on Edit** to prevent you from having to decompose the compound clips manually (you'll learn more about compound clips in Lesson 7). You can also see the source timeline by choosing **Timeline > Swap Timeline and Source Viewer**.

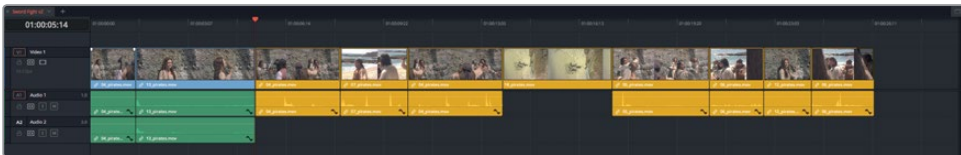
Now that you have another fully blocked-out version of the sword fight scene, let's help the director achieve his vision of a tighter fight sequence by looking at some trimming techniques that work for all types of genres but especially well for action scenes.

Cutting on Action

Cutting on action is a basic editing technique, not just for action scenes but for movement in any type of scene.

The idea is that you cut from the action in one shot to the matching action in another shot. The scene will not only flow more smoothly compared to cutting on pauses in the action but doing so adds to the continuity in the scene. You already have your basic blocked-out sword fight, so let's use some dynamic trimming to make sure your cuts happen on the action.

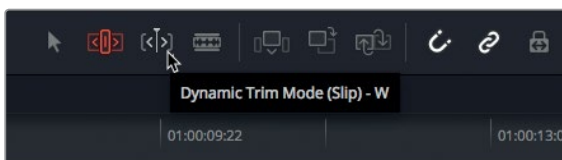
- 1 Press T to enable trim editing mode.
- 2 Move the playhead at the start of the third clip in the timeline, the **[04_pirates]** clip.



- 3 Press spacebar to play the clip.
- 4 Although the end of this clip occurs on the action of two swords hitting, the shot is too long for a fast-paced action scene. To fix this, you can cut earlier by trimming the shot so the cut occurs on an earlier sword hit.

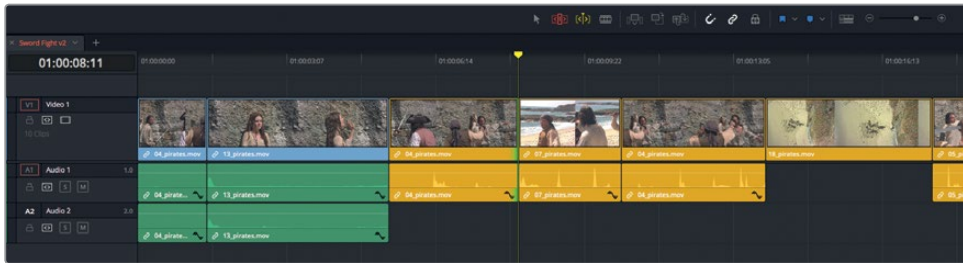
To refine this edit, you'll use DaVinci Resolve 15's Dynamic Trim Mode.

- 5 Move the playhead near the cut between the **[04_pirates]** and **[07_pirates]** clips.
- 6 Choose Trim > Dynamic Trim Mode, press W, or click the Dynamic Trim Mode button in the toolbar to enable dynamic trimming.



The edit nearest the playhead is selected and both the playhead and the dynamic trim mode button turn yellow to indicate that dynamic trimming is enabled. Now, instead of pressing JKL to shuttle up and down the timeline, these keys will adjust the selected cut point.

- 7 Press the U key twice to select the tail of the outgoing shot.



- 8 Press J to trim frames off the tail of the shot. Watch the viewer until you see the swords connect with the pirate on the left and then release the keys.
- 9 If you go too far, press L to restore frames.



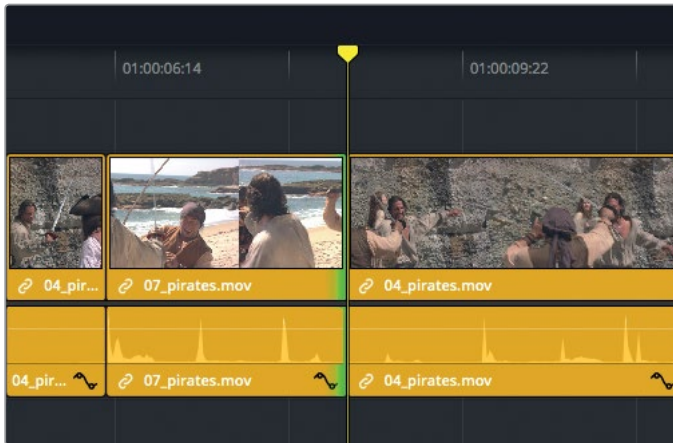
TIP If you find that the footage is playing too fast for you to place the cut, hold down the K key and tap the J or L keys to trim one frame at a time. You can also hold down the K and the L or J keys to scrub through the trim.

- 10 Press / (slash) to play around the selected cut and review the change.

TIP When working in Dynamic Trim Mode, the JKL keys enable you to trim in real time, and the spacebar, which would normally start and stop playback, changes to the “play around current frame” function.

The most important thing when placing this edit is to match the action with the earlier sword hit. You want the outgoing shot to end earlier, just before the swords make contact for the first time. Whether you cut just before or just after the action depends mostly on your sense of timing; but in this case, you should cut just before the action because the incoming shot appears to be in a good spot.

- 11 Press the down arrow to select the tail of the **07_pirates** clip.



- 12 Press / (slash) to play around the selected cut.

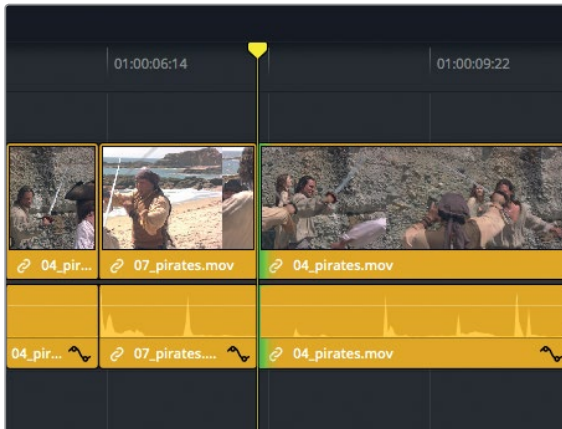
TIP If you feel that you need to see a little more or a little less when playing around the selection, you can adjust that play-around time by going to DaVinci Resolve > Preferences, selecting the User tab, and then selecting the Editing pane. In General Settings you will find options for Pre-roll time and Post-roll time.

Although this action more or less matches, it could do with quite a bit of tightening up. Again, you will use dynamic trimming to end the cut earlier.

- 13 Press J to trim back to the previous sword clash with the villain to the right of the hero.



- 14 Press the U key twice to toggle the trim to the head of the incoming shot.



TIP Remember, you can use the JKL keys to perform single frame trims by holding down K and tapping the J or L keys.

- 15 Press L to ripple trim the incoming shot forward to the point where the hero and the villain's swords clash



- 16 Press / (slash) to play around the selected cut.

Cutting on action is the basic editing technique learned by every fledgling editor. You use the action to motivate the cut. Keeping with that simple principle will lead to your edits becoming more fluid.

Repeating Action

Now that you have fine-tuned a few cuts by matching their action, let's toss a little wrench into the principles of action editing. A common contemporary tactic when cutting action scenes is to repeat the same action on key shots to really milk the impact of a shot. Sometimes action occurs too quickly and might be missed by viewers. That is the case for the trim you just made. Even a few overlapping frames in two shots can increase the dynamism of an action.

- 1 Press the up arrow to move back to the previous edit between **[04_pirates** and **07_pirates**.
- 2 Click the loop button under the timeline viewer to enable looping during playback, or press Cmd-/ (slash) in macOS or Ctrl-/ (slash) in Windows.



- 3 Press / (slash) to play over the selected cut between **[04_pirates** and **07_pirates**.
This strike in the sword fight might happen too quickly for viewers to fully “digest” it. You can create a very brief overlap to emphasize it a bit more. Let’s start on the outgoing side and then switch to the incoming shot.

In addition to using the JKL keys, you can press , (comma) and . (period) to make single-frame trims.

- 4 If necessary, press U until the tail of **[04_pirates** is selected, and then tap . (period) two or three times to add two or three frames to the tail of the cut.
- 5 As you continue loop playing, press U twice to select the head of **07_pirates**.
- 6 With the incoming side of the cut selected, tap , (comma) two or three times to add frames to the head of the cut.
- 7 Using the U key, continue selecting either side and continue to refine the overlap.
- 8 Press spacebar to stop playback.
- 9 Press W to disable Dynamic Trim mode.
- 10 Under the timeline viewer, disable the loop button or press Cmd-/ (macOS) or Ctrl-/ (Windows).

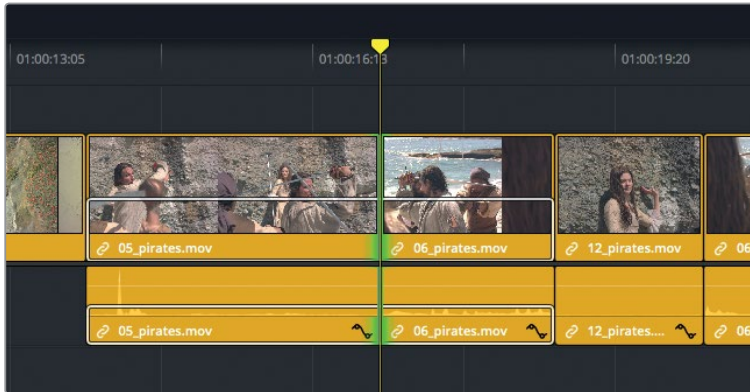
Creating these very short overlapping action frames gives the viewer time to catch up. However, the opposite is also true; making action go a bit faster can also lend a greater sense of energy to a scene.

Rolling Edits in Dynamic Trim Mode

As you’ve probably noticed when you’ve been switching between the two sides of a ripple trim, you can also roll edits in Dynamic Trim mode too.

- 1 Move your playhead forward to the edit between **05_pirates** and **06_pirates** and press / (slash) to preview the edit.
The shot feels a bit forced, waiting for the hero to turn his head.
- 2 Place you playhead near the cut and press W to enable Dynamic Trim mode and select the edit point.
- 3 If necessary, press U until you have select the edit as a rolling trim.

- 4 Press J to roll the edit back about a second to before the hero turns his head.



- 5 Press W to toggle Dynamic Trim mode off.

Slipping and Sliding in Dynamic Trim Mode

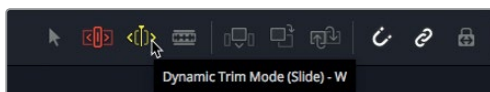
As well as making ripple and roll trims in Dynamic Trim mode, you can also make slip and slide trims.

- 1 Place the playhead over the next-to-last shot in your timeline, the reaction shot of the heroine in **12_pirates**.
The current shot doesn't clearly convey her feelings, so the director would like to use a later reaction shot.
- 2 Press T to ensure you're in Trim Edit mode, and press W to turn on Dynamic Trim mode.
- 3 Press Shift-V to select the **12_pirates** clip under the playhead.
- 4 Press J to slip the clip backward, and choose a later reaction shot that is more suitable.



TIP Slipping a shot using shortcuts often feels as if it's working in reverse. When you are slipping a clip, you're moving the content of the shot in the direction of your trim rather than relocating the in and out points.

- 5 Press / (slash) to preview your changes.
You can also slide clips.
- 6 Press S to switch Dynamic Trim mode from slip to slide. The toolbar button changes.



- 7 Hold down K and tap J a couple of times to slide the reaction shot backward a few frames. Be careful not to slide too far because you still want to see the hero's cheeky wink.

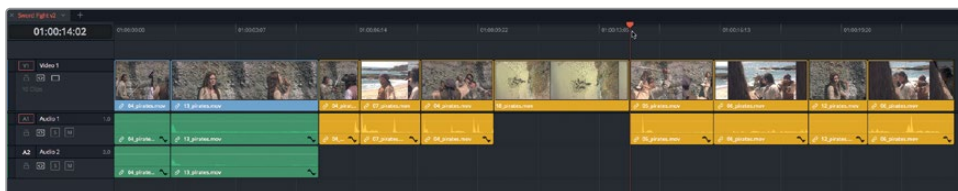
TIP You can also switch between slip and slide trims by right-clicking the Dynamic Trim mode button in the toolbar.

- 8 Press W to turn off Dynamic Trim mode and A to return to Selection mode.
As you can see, working in Dynamic Trim mode has many advantages when it comes to ripple, roll, slip, and slide trimming. However, you can employ a number of other editorial tricks to further enhance this action scene.

Enhancing the Action

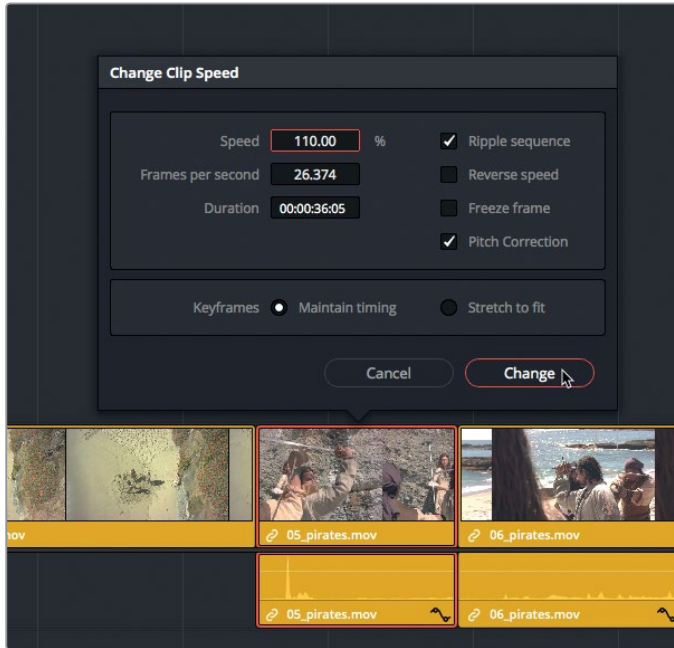
Changing the speed of clips in an action scene requires a delicate touch to get that extra boost of energy without making a scene look comical. Depending on the shot, a speed increase between 10 or 15 percent will give a fight scene some extra punch.

- 1 Play the **05_Pirates** clip.



First, let's change the speed of one clip.

- 2 Select the **05_pirates** clip , right-click it, and choose Change Clip Speed.
- 3 In the Change Clip Speed dialog, set the Speed to 110.00 %. Select “Ripple sequence” and Pitch Correction, and click Change.



Selecting “Ripple sequence” ensure that gaps won’t be created in your timeline as you speed clips up and shorten their durations. Selecting Pitch Correction will keep the audio sounding natural.

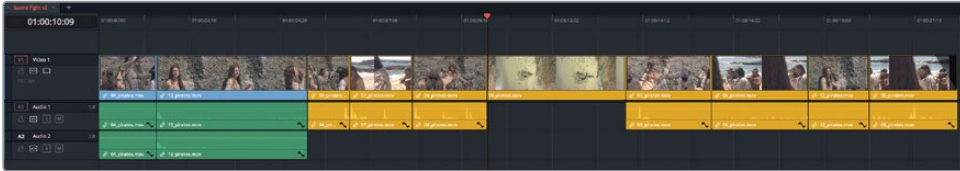
NOTE Pitch correction is available only when using macOS 10.10 “Yosemite” and newer.

- 4 Play over the changed shot to review the speed change.
Notice how much more forceful the sword swipes appear. It’s subtle, but adding it to shots in which the actors move a bit too slowly makes the action appear more realistic. For extra good measure, see if you can influence the director and director of photography to shoot actions scenes with a fast shutter speed. Combining that footage with speed changes will make your scene feel even more energized.

Increasing Tension with Variable Speed Changes

Not all clips require a device as simple as a constant speed change. Occasionally, you will want to assign different playback speeds to different ranges within a clip. This is the case with one of the shots in your timeline.

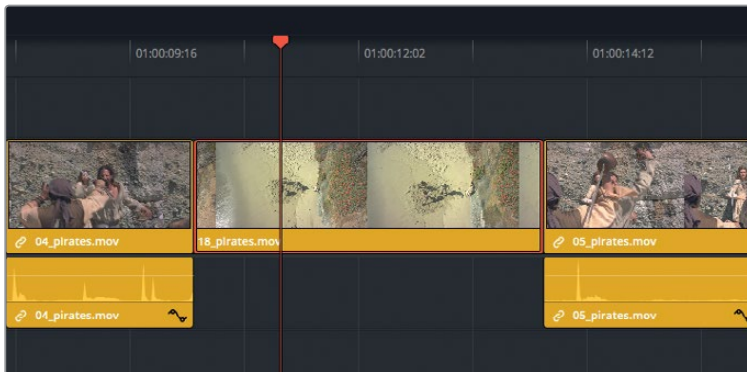
- 1 Move the timeline playhead back to **18_pirates**.



- 2 Play over the clip to review it.

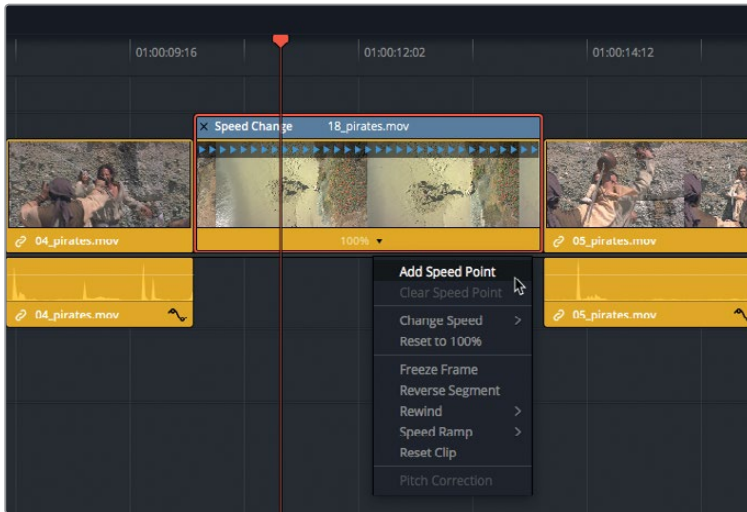
Although this clip looks fine at 100-percent speed, the middle of the clip has a pause in the action. It would be nice to extend this to build more tension toward the end of this fight. Using the retime controls, you can divide the clip into ranges, and assign different playback rates for each range.

- 3 Position the playhead about one-third of the way into the clip.



This roughly locates the area you should slow down to extend the pause in the action.

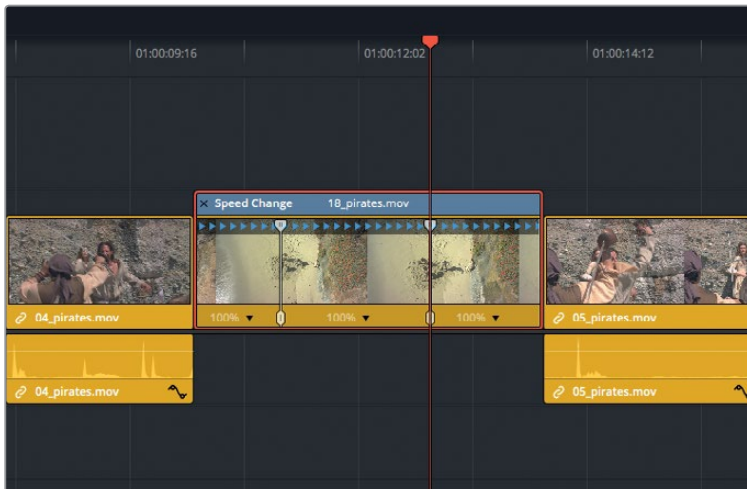
- 4 Right-click the clip, and choose Retime Controls, or press Cmd-R (macOS) or Ctrl-R (Windows).
- 5 At the bottom of the clip, in the Change Speed submenu, choose Add Speed Point.



A speed point is added at the playhead location, dividing the clip into two ranges, each with its own Change Speed submenu. You'll add one more speed point, so you want to slow down only the middle of the clip and return to sound speed after that.

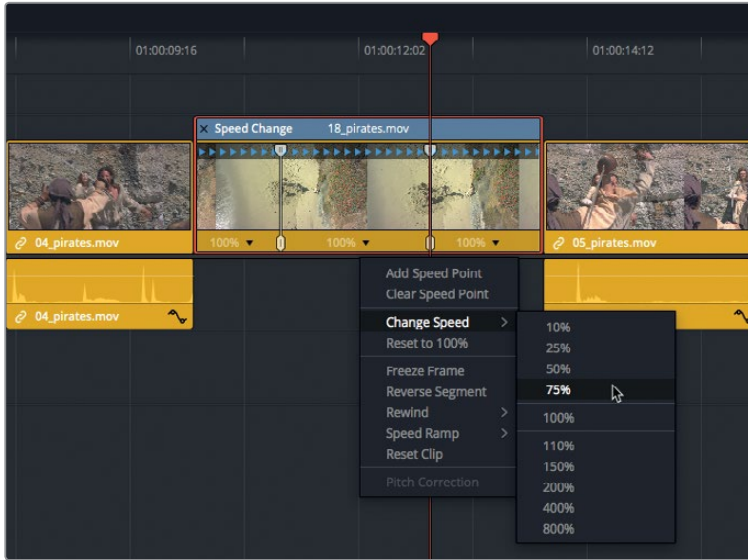
- 6 Position the playhead about two-thirds of the way into the clip.
- 7 At the bottom of the clip, in the Change Speed submenu, choose Add Speed Point.

You have now divided the clips into three sections that you will use to ramp down the speed in the middle.



Because clip durations change when you change the playback speed of clip sections, you can decide if the changes should open gaps or ripple the timeline by choosing the selection tool or the trim mode tool. In this case, you want to make these edits tighter, so you'll ripple trim using the trim mode tool.

- 8 Press T to enable Trim Edit mode.
- 9 In the Change Speed submenu under the section in the middle, choose Change Speed > 75%.



The time appears next to the Change Speed submenu update to show each section's current playback speed and the timeline ripples to accommodate the clip's change of duration.

- 10 Play over the clip to see the results of the variable speed change.

You can modify the position of each speed point and the speed of each section by dragging the speed points. Each speed point has two handles: The upper handle will speed up or slow down the section to the left, whereas the lower handle will change the location of the speed point.

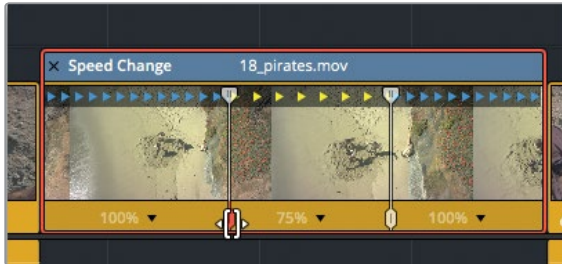
Changes playback speed to speed section left of speed point



Changes the frame where the speed point occurs

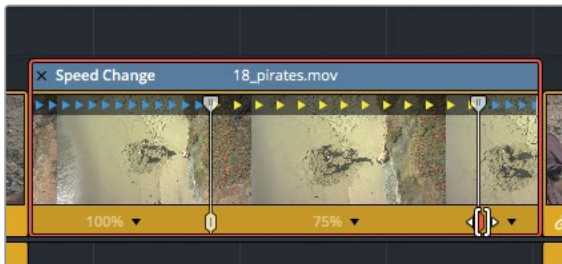
On your clip, if you want the slow speed to occur only during the small pause in the sword fight, the first speed point is placed too early and the second speed point is placed too late.

- 11 On the first speed point, drag the lower handle to the right until the male lead finishes engaging in the sword fight with the pirate who is lower in the frame.



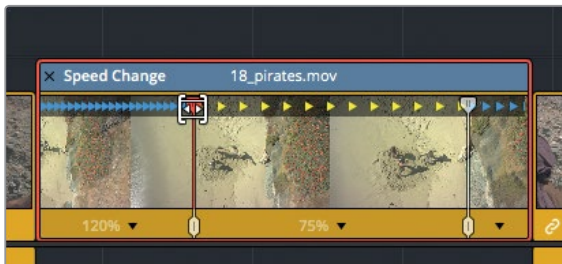
Notice that the speeds of both sections on either side of the speed point did not change speed. Only the location of the speed point has changed.

- 12 On the second speed point, drag the lower handle to the right until the male lead begins to engage again with the pirate who is higher in the frame.



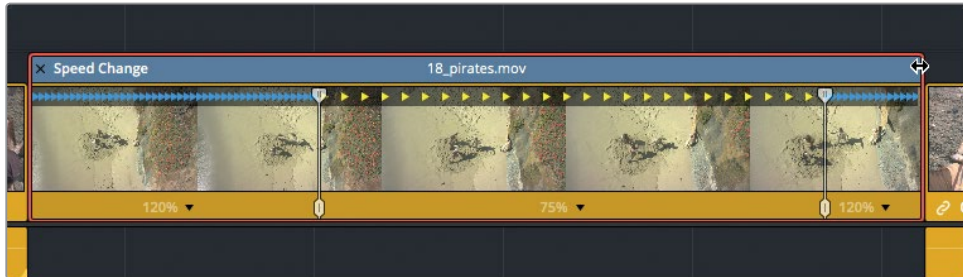
Now you might want to keep those locations, while changing the speed of the first and last segments to speed them up just a bit.

- 13 On the first speed point, drag the upper handle to the left until the speed of the first segment is roughly around 120%.



The last segment does not have a speed point, but you can change the speed of the segment using the speed bar at the top of the clip.

- 14 Position the mouse pointer over the upper-right corner of the speed bar.



The pointer changes to a resize cursor and you can drag the edge to change the speed of the last segment.

- 15 Drag the speed bar corner to the left until the speed of the first segment is roughly around 120%.
- 16 Play over the clip to review your changes.
- 17 Press Cmd-R (macOS) or Ctrl-R (Windows), or right-click the clip and choose Retime Controls, to close the retime controls.
- 18 Press A to change to the selection tool.

Being able to manipulate the speed and location of a speed change independently using one speed point is a simple yet powerful device. You'll explore even more ways to manipulate speed and speed points in Lesson 5.

Adding and Selecting Multiple Cuts

In addition to changing a clip's speed, a technique often used to raise the energy of action scenes is to simply remove one or two frames just before the action. Placing this subtle jump cut just before a hit or some other action can often make the shot appear more intense.

- 1 Press Shift-Z to see the entire timeline.
- 2 Position the playhead over the fourth clip in the timeline, **07_pirates.mov**.
- 3 Play over the clip to review it.

Because you need to remove just a frame or two, it is easiest to create an edit point where you want to remove the frames.

- 4 Position the playhead a few frames from the start of **07_pirates.mov**, just as the hero and the villain's sword are still touching, but before the villain moves back slightly.



Positioning the playhead close to the point of action usually adds to the impact.

- 5 Choose Timeline > Razor, or press Cmd-B (macOS) or Ctrl-B (Windows), to add a through edit at the playhead position.

This command adds an edit across all the clips with auto select enabled.

- 6 Position the playhead a few frames before the end of **07_pirates.mov**, just before the swords clash.



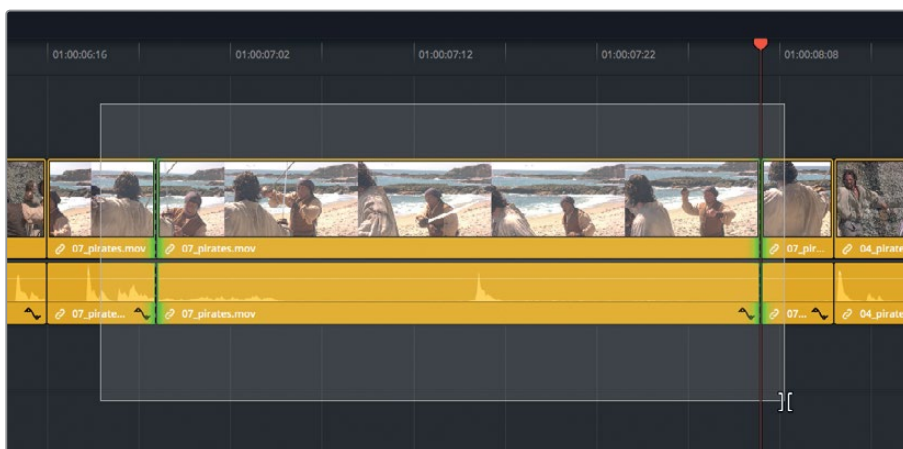
- 7 Again, choose Timeline > Razor, or press Cmd-B (macOS) or Ctrl-B (Windows), to add a second through edit at the playhead position.

With the edit points in place, you can select both edit points and trim them simultaneously.

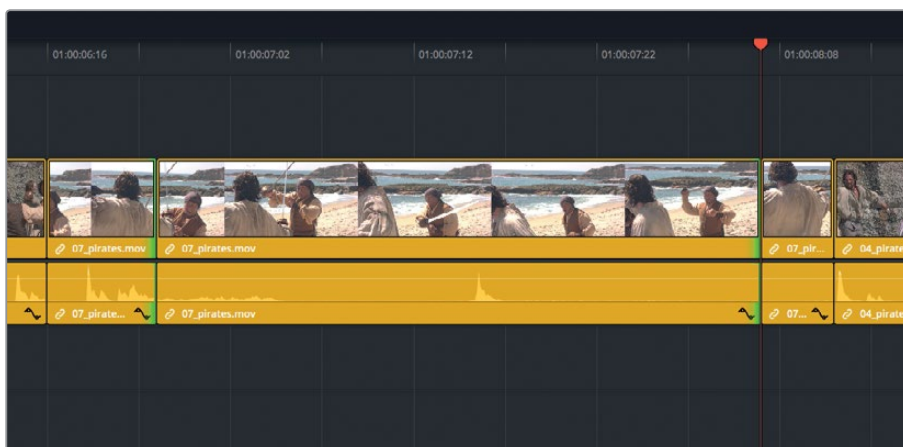
- 8 Press T to select Trim Edit Mode.
- 9 Position the pointer in the gray area of the timeline above and to the left of the first razor edit you created.

TIP You may need to zoom into the timeline to perform this selection.

- 10 Drag down and to the right until both through edits are selected.



- 11 Press the U key until only the outgoing side of both through edits are selected.



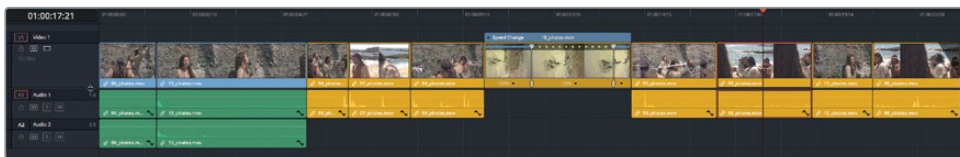
- 12 Press , (comma) to trim one frame from each of the selected cuts.
- 13 Press / (slash) to preview these new cuts.
- 14 Press A to return to the selection tool.

When used in the right locations, this type of trim can have an effect similar to shooting with a fast shutter speed. When done well, it quickens the pace of an action scene.

Reframing Shots

Controlling the speed of a clip—either through single-frame trims or retiming shots—helps to build tension, even if only for a split second. Mixing up angles can have the same effect. Unlike a typical dialogue scene, when you have multiple camera angles available for an action scene, use them! And when you don't have them, you can fabricate them by resizing and repositioning shots you do have.

- 1 In the timeline, position the playhead at the start of the third clip from the end, **06_pirates**.

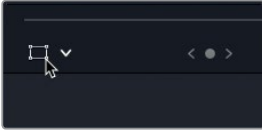


- 2 Select the clip, and press / (slash) to play over it.

This is the main hero shot in the scene, yet it is a fairly wide shot with a lot going on. It might be a better hero shot if you turned it into more of a close-up.



- 3 In the lower-left of the timeline viewer, click the on-screen controls.



To use the on-screen controls to scale up the image, you need to create more room around the frame. You can do so by reducing the image magnification in the viewer.

- 4 Use your middle mouse wheel to zoom out in the timeline viewer, or in the magnification menu in the upper-left of the timeline viewer, choose a value lower than your current setting so the image and its on-screen controls appear smaller in the viewer.



- 5 Drag out any corner handle of the wireframe to slightly increase the size of the image.



Now you'll reposition the shot so it is nicely framed on the hero without cutting off the pirate to the right.

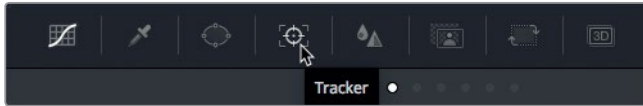
- 6 Drag anywhere within the wireframe to reposition the shot to show more of the right side of the frame.



- 7 Press / (slash) to play over the resized and repositioned clip.

The rescaling appears fine, but the camera movement that was acceptable as a wide shot is now too chaotic for a close-up. You can smooth out the camera movement using Resolve's stabilizer, which is located on the Color page.

- 8 Click the Color page button, and in the toolbar, select the tracker button.



- 9 In the mode pop-up menu in the upper-right corner of the Tracker palette, choose Stabilizer.

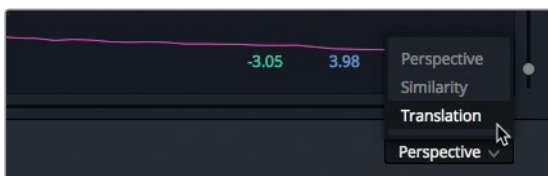


- 10 Click the Stabilize button
- 11 Press Cmd-/ (slash) in macOS or Ctrl-/ (slash) in Windows to turn on loop, and click play to see the results.

Unfortunately, the Stabilizer has introduced some strange twisting motion in the image. This is because the Resolve stabilizer not only stabilizes vertical and horizontal camera movement, it can also stabilize tilt, rotation, zooming, and perspective.

You want to keep that handheld feel while smoothing out some of the erratic camera movement. To do so, you will stabilize only the up and down camera movement.

- 12 In the Stabilizer window, in pop-up menu in the lower-right, change Perspective to Translation.

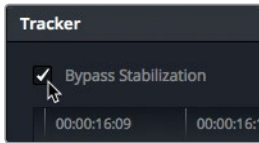


Whereas the default Perspective setting stabilizes all characteristics of a camera move, choosing Translation stabilizes only the X and Y movement.

- 13 Click the Stabilize button again.

Notice that using that stabilization setting retained the overall natural camera movement while smoothing out the X and Y motion. Let's look at the unstabilized clip to refresh your memory of the original shot.

- 14 While the clip is looping, select the Bypass Stabilization checkbox to disable the stabilization.

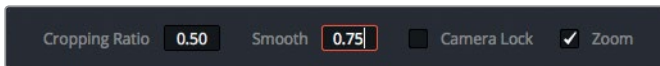


The clip instantly scales down a bit because this is how stabilizers work. They up-size the image just enough to apply inverse motion that offsets the camera movement.

- 15 Deselect Bypass Stabilization to reenable the stabilization.

The results could still use a bit more smoothness to the motion.

- 16 At the bottom of the Stabilizer palette, in the Smooth data field, enter 0.75.



Increasing the Smooth parameter value will remove additional jarring motion while retaining the primary camera motion. Increasing the smoothness also requires additional image resizing, so it is best to start with clips recorded at resolutions larger than the final output.

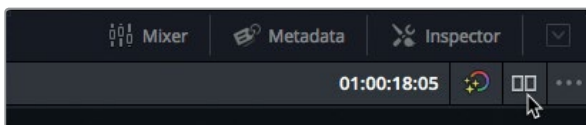
- 17 Return to the Edit page.

You may think that all this resizing would lower the quality of your image, but in many cases it does not. When cutting 4.6K content from a Blackmagic Design URSA camera for HD or even 2K digital cinema output, you have the benefit of being able to zoom in and reposition clips to get the framing you want. Even though the project may be in HD, DaVinci Resolve is smart enough to always start with the original clip's size when resizing.

Comparing Timeline Versions

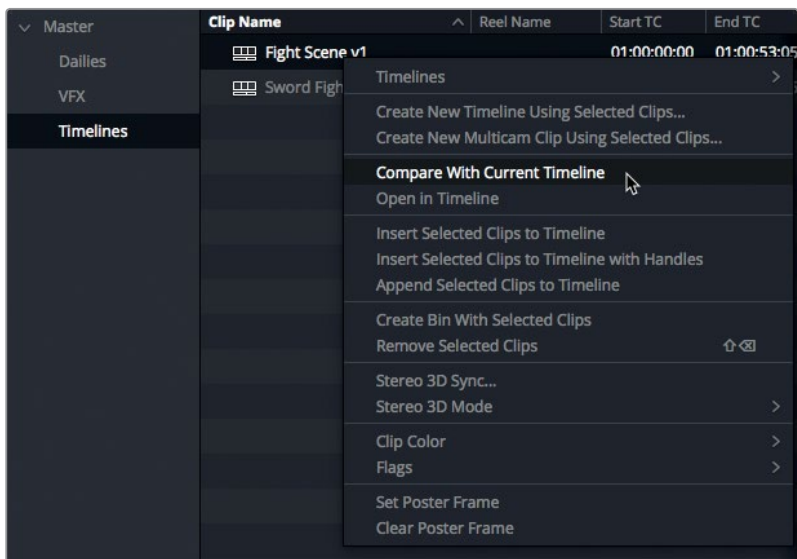
Throughout any project you will create several versions of a timeline. And when multiple versions of a scene exist, someone inevitably will want to know how they differ. So, it is up to you to know be able to point out those differences. Resolve includes a unique and helpful comparison tool for comparing two versions of a scene.

- 1 In the upper-right corner of the timeline viewer, click the double box icon to return to Dual Viewer mode, and then click the Media pool button.



- 2 In the Media pool, select the timelines bin.

- With the Sword Fight v2 timeline still open, right-click the Fight Scene v1 timeline, and choose Compare With Current Timeline.



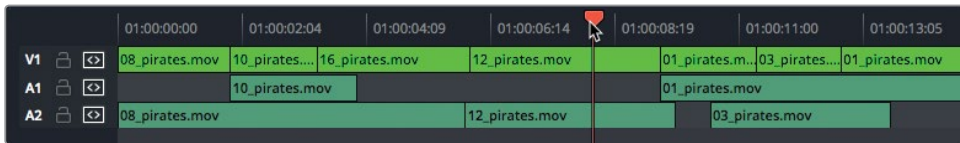
The timeline comparison window shows the current timeline in the timeline viewer along the bottom and the timeline that you right-clicked along the top.

- In the upper-right corner of the timeline comparison window, drag the zoom slider to the left until you see both timelines in their entirety.



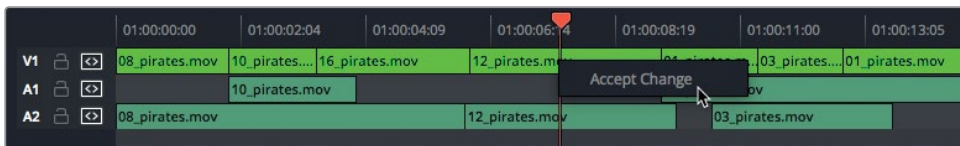
Areas of the timelines are highlighted to indicate larger areas in which changes occur. The green highlights indicate entirely new sections that do not appear in the current timeline. The red highlights indicate sections that do not appear in the right-clicked timeline. Both the upper and lower timelines have their own playheads, so you can review each one. Your current Sword Fight v2 timeline will play in the timeline viewer as usual, and the Fight Scene v1 timeline will play in the source viewer.

- 5 Drag the upper timeline playhead over the green section of the comparison timeline.



The comparison timeline appears in the source viewer. To view the current timeline in the timeline viewer, you can drag the playhead along the lower timeline.

- 6 Drag the lower timeline playhead over the red section of the timeline to see it in the viewer. As you compare the two timelines, you can accept and add changes into the current timeline.
- 7 Right-click the first green area in the comparison timeline, and choose Accept Change.



The green section in the comparison timeline is now added to the current timeline.

- 8 Right-click the second green area at the end of the upper timeline, and choose Accept Change to add the closing shots from the original cut to your new, enhanced cut.
- 9 In the lower-right corner, click the close button to return to the current timeline with all the new changes.

As you may have noticed, you edit action scenes with many of the same tools you would use in any other genre, but you do so in distinctive ways. Action scenes are just short storylines in and of themselves, so the tools and some of the techniques used to advance a dialogue scene are also used here. You needn't be anxious about editing your first action scene; just remain organized and treat it like a mini-story.

Lesson Review

- 1 How can you see more than one timeline at the same time?
 - A) Choose Timeline > Open Additional Timeline
 - B) Cmd-double-click (macOS) or Ctrl-double-click (Windows) another timeline
 - C) By enabling tabbed timelines in the Timeline View Options menu
- 2 What visual indicators does Resolve give to let you know you're in Dynamic Trim Mode?
 - A) The Dynamic Trim toolbar button changes to yellow
 - B) The timeline playhead changes to yellow
 - C) The Trim Edit mode button changes to yellow
- 3 True or False: The function of the J, K and L keys differ when you are in Dynamic Trim Mode?
- 4 What does the lower speed point handle adjust?
 - A) The speed of the clip to the left of the speed point
 - B) The speed of the clip to the right of the speed point
 - C) The position of the speed point on the clip
- 5 Where are the stabilization controls located?
 - A) In the Effects Library
 - B) In the Inspector of the selected clip
 - C) In the Color page

Answers

- 1 C. You enable stacked and tabbed timelines by clicking the top left button in the Timeline View Options pop-up.
- 2 A. and B. The timeline playhead and the Dynamic Trim Mode toolbar button both change to yellow.
- 3 True. When in Dynamic Trim Mode, the J, K and L keys are used to trim the selected edit(s).
- 4 C. The lower speed point handle adjusts the position of the speed point on the clip without adjusting the speed either side.
- 5 C. The stabilization controls are located on the Color page.

Lesson 6

Editing Multicamera

Many types of productions capture a scene using multiple cameras running simultaneously, including scripted dramatic series, reality programming, interviews, and music videos. These multicamera productions all require a unique editing setup in which you can synchronize and view all of the angles at once.

DaVinci Resolve 15's multicamera feature allows you to initially synchronize multiple clips, and then easily manage and edit between camera angles without any further concern about sync issues. Resolve enables you to cut to any camera angle, safe in the knowledge that you can later change your mind and select a different angle from the same sync point.

In this lesson, you will explore the power of multicamera functionality, discover some of the best ways to work with simple and complex multicamera setups, and learn how to solve some common challenges.

Time

This lesson takes approximately 75 minutes to complete.

Goals

Syncing Angles	172
Editing a Multicamera Music Video	178
Complex Multicamera Editing	186
Lesson Review	197

Syncing Angles

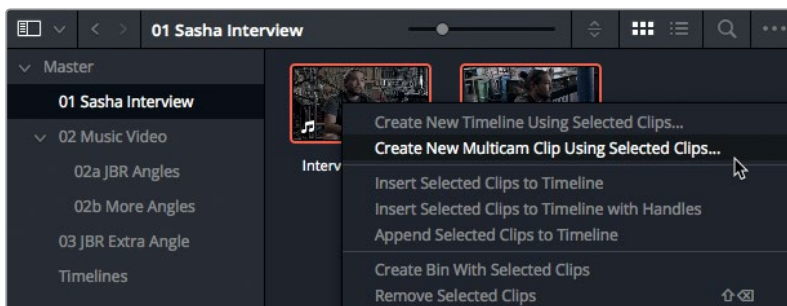
From the very beginning of a project, accurately establishing the sync relationship between multiple camera angles is critical to a successful multicamera edit, so let's look at the various ways you achieve this in Resolve.

- 1 In the Project manager, right-click and choose Import. Navigate to R15 Editing 201 > Lessons > Lesson 06 Multicam. Select R15 Editing Lesson 06 Multicam.drp, choose Open, and click OK to import the project into your Project manager.
- 2 Open the project, and relink media files.
- 3 In the Media pool, select the 01 Sasha Interview bin.
- 4 Play each of the clips to review the interview contents.

This bin contains two clips shot from different angles of an interview with Sasha from the cycle shop Citizen Chain in which he explains the inspiration for the business's name. It's a nice story, but the director would like it to flow a little better. Thankfully, because this interview was shot on more than one camera, you can cut between the cameras instead of adding b-roll cutaways to cover jump cuts in the edit, or patching the interview with the Smooth Cut transition.

First, you need to sync the interview clips.

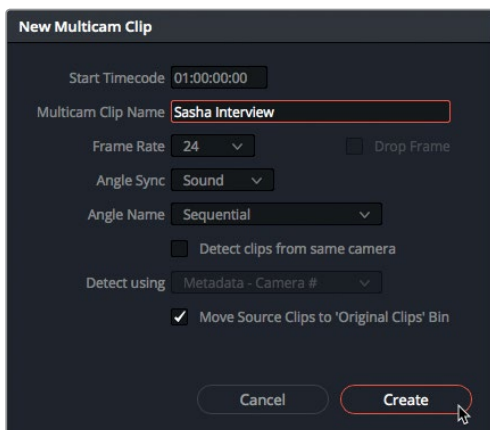
- 5 In the Media pool, select both clips. Right-click either clip, and choose "Create New Multicam Clip Using Selected Clips".



The New Multicam Clip window opens in which you can select how Resolve will create the multicam clip.

- 6 In the Multicam Clip name, type **Sasha Interview**.
- 7 Leave the Frame Rate at 24. Resolve uses the frame rate of the source clips.
- 8 Change the Angle Sync to Sound.

Resolve will automatically synchronize the two clips using their audio content as references, much as you did when syncing dual system clips in Lesson 1.



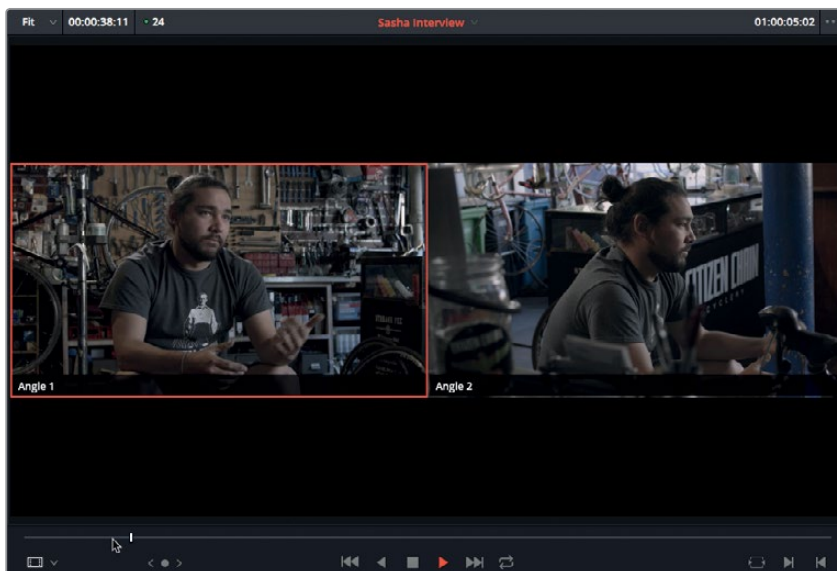
- 9 Leave “Move Source Clips to ‘Original Clips’ Bin” selected.
- 10 Click Create.

Resolve analyses the clips’ audio and creates a new multicam clip in the selected bin called **Sasha Interview**. A new bin also appears, Original Clips, that contains the two interview source clips.

Viewing the Multicam Clip

Now that you have created the multicam clip, you can work with it just as any other source clip. However, because it contains both angles in a single clip, you can switch between the two shots at any time.

- 1 Double-click the **Sasha Interview** multicam clip to open it in the source viewer.

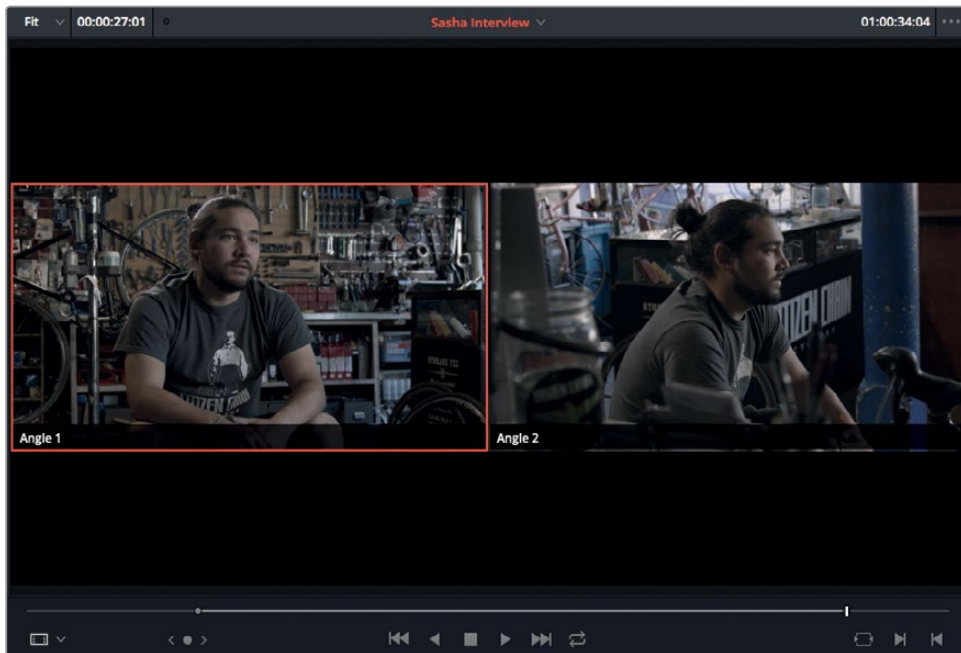


Because this is a multicam clip, Resolve automatically displays both angles side-by-side. The angle with the red outline represents the currently active angle, the angle that you will see and hear.

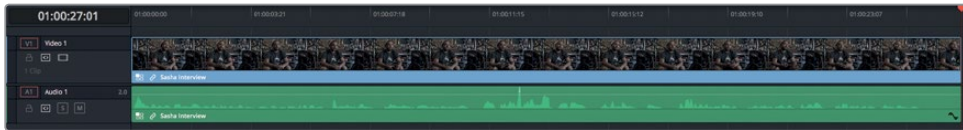
- 2 Play the multicam clip in the source viewer. Both angles should be in sync.

NOTE You may notice some black frames at the start on the shot on the left, labelled Angle 1, because the camera recording this shot may have started rolling a short time after the other camera started. These frames are not a problem. In fact, multicamera source clips don't have to be exactly the same length.

- 3 In the source viewer, set an in point just before Sasha says, "I was a big fan of Orson Welles (around 01:00:07:00).
- 4 Set an out point after Sasha nods at the camera, but before he says, "Sort of a happy coincidence" (around 01:00:34:00).



- 5 Select the Timelines bin, and press Cmd-N (macOS) or Ctrl-N (Windows), or choose File > New Timeline.
- 6 Name this timeline **Multicam Interview**, and click Create.
- 7 Press F10 to perform an overwrite edit into the Multicam Interview timeline, and press Shift-Z, if necessary, to view the whole clip.

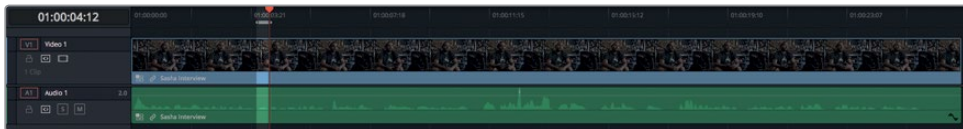


When you play this multicam clip in the timeline, you'll see only the currently active angle. The second angle is hidden.

Refining the Radio Edit

Now that you have the interview in the timeline, you can start to edit to improve the flow of Sasha's storytelling. First, you'll have to remove a couple of distracting "umms" and "ahhhs" to remove. Then, you'll want to tighten up the last part of the interview.

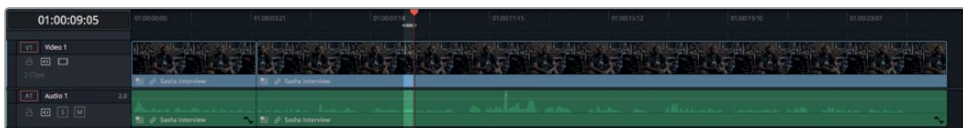
- 1 Play through the timeline until you hear the first "ahhh." Set an in point before that "ahhh," and set an out point before Sasha says, "Going through school."



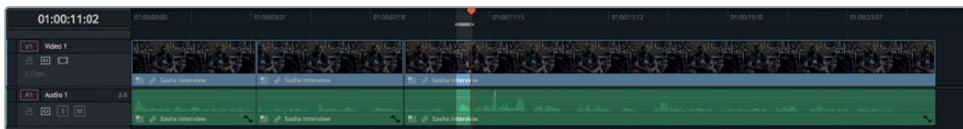
- 2 Press Shift-Delete (or Backspace) to ripple delete the marked section.
- 3 Press / (slash) to preview the edit.

By now, this process should be second nature to you.

- 4 Continue playing the timeline and use the same technique to remove the "ummm" a few seconds later, after he says, "I appreciate the pun," and before he says, "Citizen Chain, Citizen Kane."



- 5 Another "ahhh" occurs before he says, "And only after we named the shop." Ripple delete it.

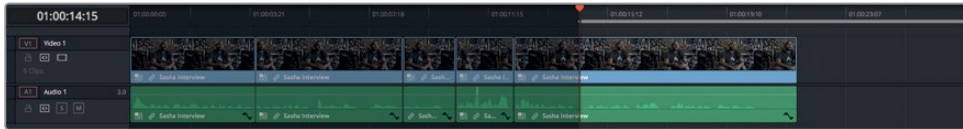


- 6 Set another in point after he says, "It was only after we named the shop," and place an out point just before he says, "We found out that Rosebud was really a bicycle." Again, ripple delete this section of the interview to tighten up the punchline of the story.

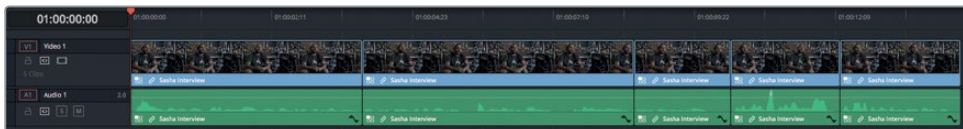


At this point, your director is satisfied that your new cut has engaged the audience sufficiently, so doesn't want to use the rest of the interview.

- 7 Set an in point before Sasha says, "The inspiration for Rosebud," but don't set an out point.



- 8 Press Delete (or Backspace) to remove the rest of the interview from this timeline.
- 9 Press Shift-Z to fit the timeline in the available space.
- 10 Press Home to return your playhead to the start of the timeline, and click play to listen to this radio edit.



Remember, at this stage you are listening to ensure that the interview sounds right and contains no obviously distracting audio edits. If you need to adjust any edits, use the techniques you learned in Lesson 3 to ripple trim the edit points to suit yourself.

Once you have the radio edit working, you're ready to switch the angles of your multicam clip.

Switching Angles in the Timeline

Not all multicamera edits must be done on-the-fly, cutting between angles in real time as the footage races past. You can switch between the different angles within a multicam clip at any time.

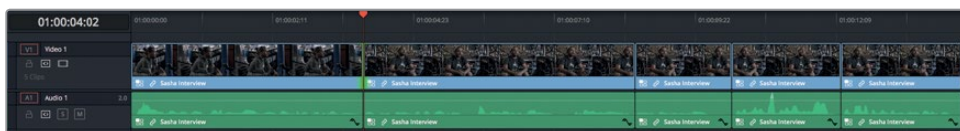
- 1 In the Multicam Interview timeline, place the playhead on the edit between the first and second clips.

TIP You can identify a multicam clip in the timeline by the little box icon next to the name of the clip.

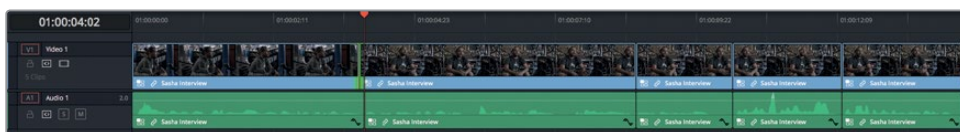
- 2 Press / (slash) to review the cut.
Ouch! I think you'll agree, that's a pretty nasty jump cut.
- 3 Right-click the first clip in the timeline, and choose Switch Multicam Clip Angle > Angle 2.



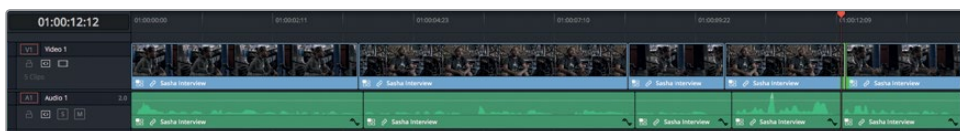
- 4 Press / (slash) to review the new edit.
Now, the jump cut isn't quite so noticeable, but splitting the edit will hide it a little more effectively.
- 5 Press V to select the edit between the first and second clips.
- 6 Press Option-U (macOS) or Alt-U (Windows) to select the video edit, and press U, if necessary, until the video edit is selected as a rolling trim.



- 7 Press , (comma) two or three times to roll back the video edit a few frames to create a small L-cut.
- 8 Press / (slash) once more to review the edit.
The slight offset of the video edit from the audio cut slightly softens the edit, making it much less jarring.

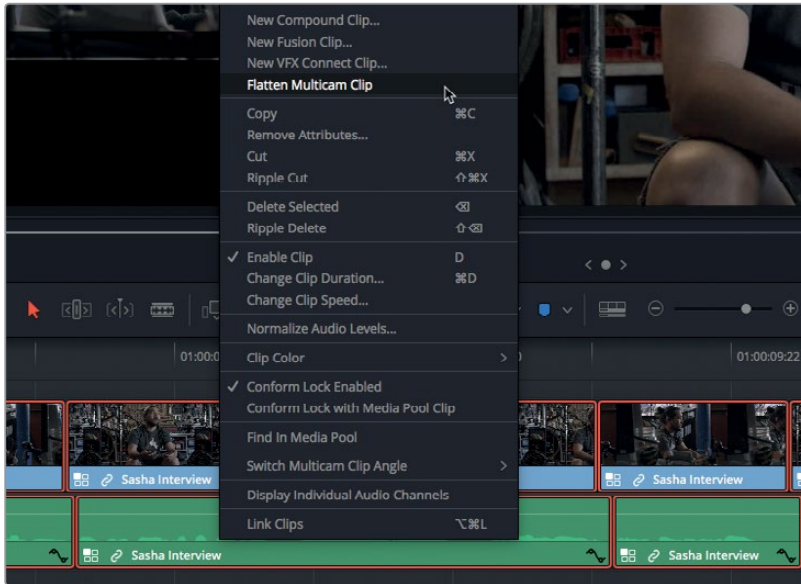


- 9 In the timeline, select the third clip. Right-click it, and choose Switch Multicamera Clip Angle > Angle 2.
- 10 Select the fifth clip, right-click it, and choose Switch Multicamera Clip Angle > Angle 2.
- 11 Review each of these edits, and if necessary, repeat the rolling trim procedure to split the video edit from the audio edit. Offsetting the edits even one or two frames can make a big improvement in the way the edits are perceived.



TIP Remember, you don't always have to roll the edit backward to create an L-cut. A cut might work better if you roll the video edit forward to create a J-cut.

- When you have finished, press Cmd-A (MacOS) or Ctrl-A (Windows) to select all the clips in your timeline. Right-click any of the selected clips, and choose Flatten Multicam Clip.



Flattening a multicam clip in the timeline removes all the additional angles, and leaves the active angle in its place as a normal timeline clip.

By shooting this interview with more than one camera, you are able to cut the interview effectively without having to paint it entirely with b-roll or rely on the Smooth Cut transition.

Editing a Multicamera Music Video

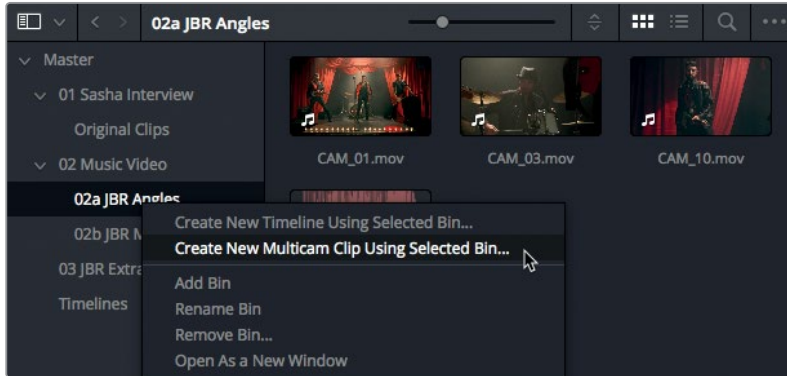
The fun aspect of working with a multicamera edit is that you can cut between the different cameras in real time, as if you were sitting in the studio gallery and directing a live shoot. Often, this real-time technique will save you hours because you're able to cut the material in the time it takes to play the timeline.

In the next exercise, you're going to concentrate on a simple multicamera edit for the beginning of a music video. You will then explore more in-depth features of multicam editing in DaVinci Resolve 15.

- In the Media pool, select the Timelines bin, and press Cmd-N (macOS) or Ctrl-N (Windows) to create a new timeline. Name this timeline **Simple Music Video**.

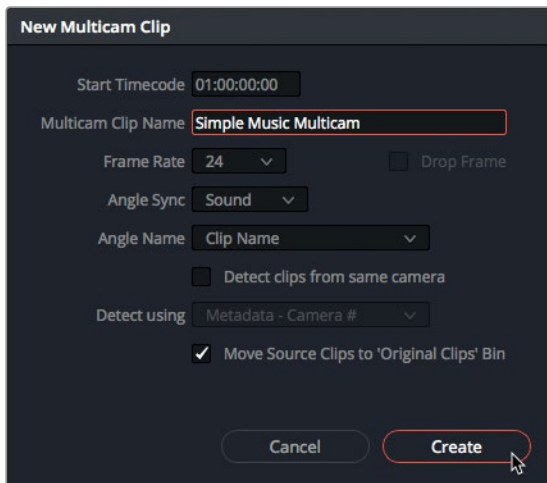
The new timeline automatically opens and replaces the previous timeline in the timeline window.

- 2 Right-click the 02a JBR Angles bin, and choose Create New Multicam Clip Using Selected Bin.



TIP You can create multicam clips using selected clips or the contents of one or more selected bins.

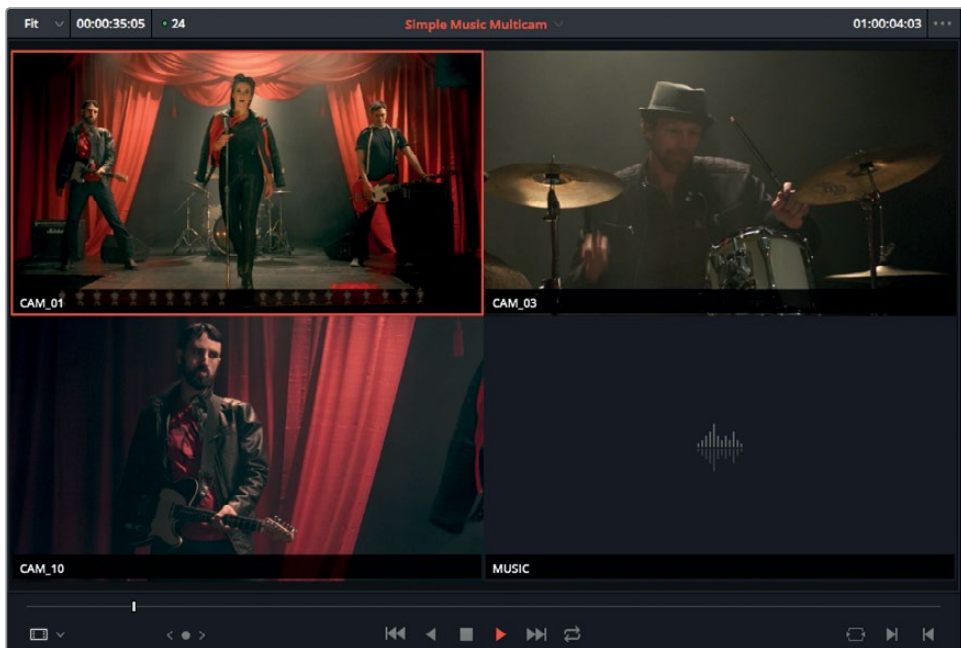
- 3 In the New Multicam Clip window, name your multicam **Simple Music Multicam**.
- 4 Change the Angle Sync to Sound.
- 5 Change the Angle Name to Clip name.



Once again, the multicam clip is created in the selected bin, and the original source clips are tucked into a new Original Clips bin.

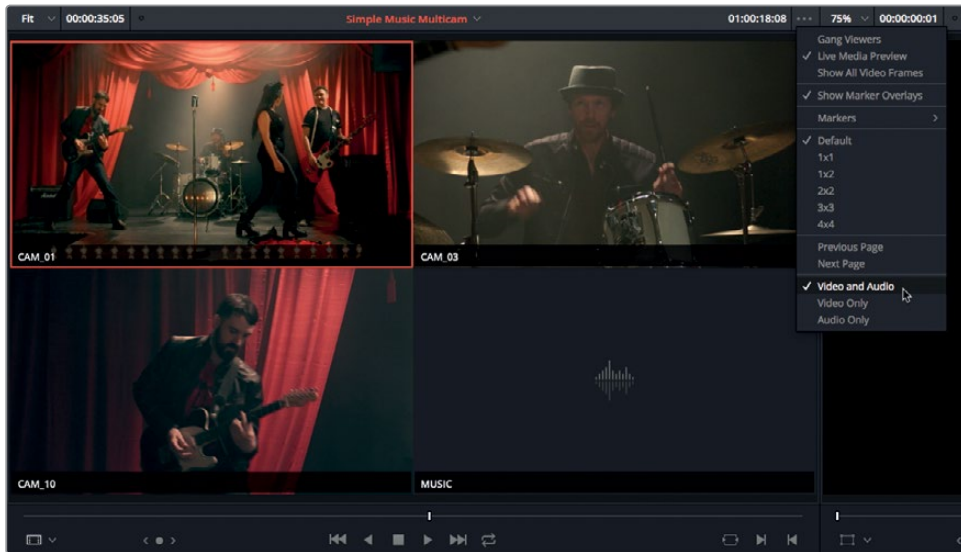
NOTE The Angle Name option dictates the order in which the angles are sorted. When you choose Sequential, Resolve labels the angles and sorts them as Angle 1, Angle 2, and so on, based on their starting timecode values. Choosing Clip name sorts the clip names in ascending alphanumeric order and labels the angles. Similarly, choosing “Metadata - Angle” or “Metadata - Camera” sorts the clips based on information in their respective metadata fields.

- 6 Double-click the **Simple Music Multicam** clip to open it in the source viewer. At first, it looks as if these clips have no video content; but if you play through the first few seconds, you'll see the video of each clip appear because the audio clip starts a little before each of the video clips, much as in Sasha's interview.



The multicam source viewer organizes the angles from left to right and from top to bottom. So, in this 2x2 multicam layout, angle 1 will appear in the upper-left window and angle 4 will appear in the lower-right window. Notice that the angles names have inherited the original clip names.

7 In the source viewer options menu, make sure “Video and Audio” is selected.

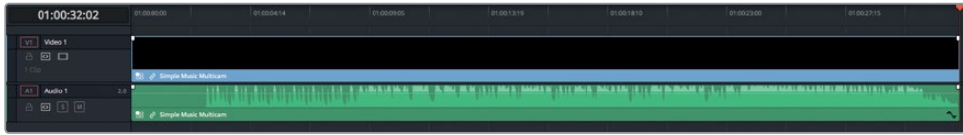


8 In the source viewer, click the MUSIC angle to select it.



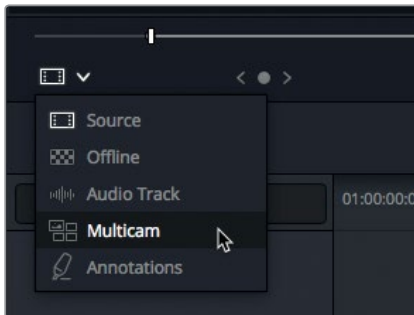
When you play the clip back in the source viewer, you will now hear the music track rather than the camera audio recorded on the set.

- 9 Set an in point just before the music starts, after the sync bleeps (at 01:00:03:03).
- 10 Perform an overwrite edit to edit this clip into the empty timeline.
- 11 Press Shift-Z, if necessary, to view the whole clip, and press Home to return the playhead to the start of the timeline.



In the timeline, the clip remains blank because you are monitoring an angle that has no video, the angle with the music track.

- 12 In the source viewer mode pop-up menu, choose Multicam to display the multicam viewer.



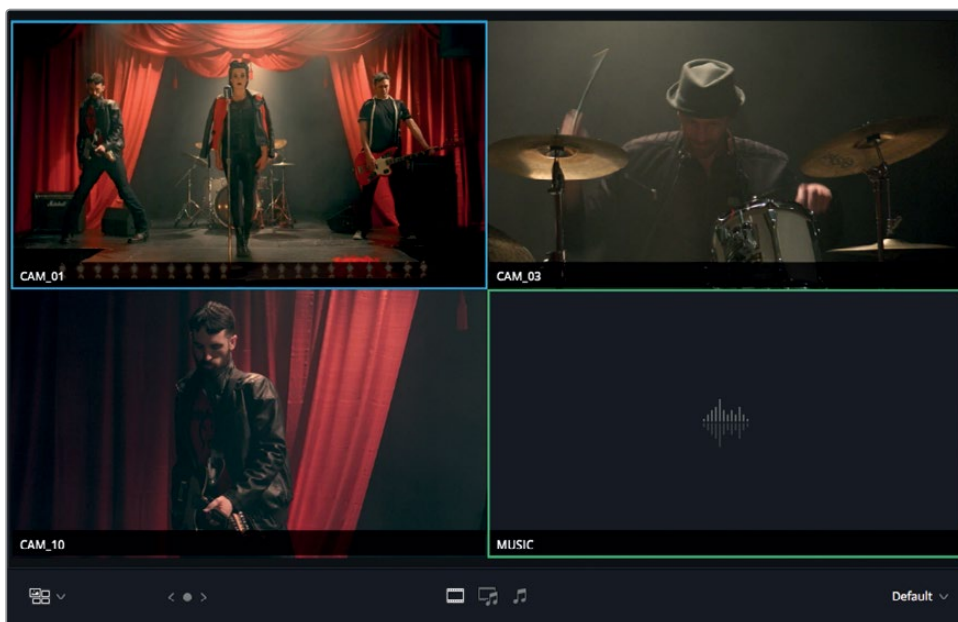
In the source viewer below the multicam clip, you see three buttons that set the parts of this multicam clip you will edit: video, video and sound, or only sound.



- 13 Click the video button to the left to edit only the video of this multicam clip.



- 14 In the source viewer, Option-click (macOS) or Alt-click (Windows) the video for CAM_01. Holding down the Option (macOS) or Alt (Windows) key switches the video of the active angle. If you didn't use this keyboard modifier, you would cut the video of the active angle.
- 15 The source viewer now displays two boxes; the blue box identifies the active video angle and the green box identifies the active audio angle.

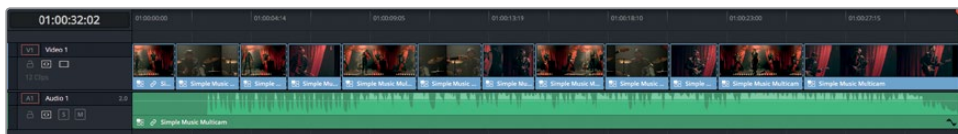


Now for the fun part...

- 16 With the playhead at the start of the timeline, click play, and begin clicking each of the video clips in the source viewer to cut between the angles of the multicam clip. You will see the edit points appear in the timeline as you cut between the angles. Keep going until the angles run out and you reach the end of the timeline.

TIP You can also press the 1, 2, and 3 keys along the top of your keyboard to cut between the angles in real time.

- 17 Return the playhead to the start of the timeline, and click play to review your multicamera masterpiece.



This first attempt at a real time multicamera edit is probably not going to result in a perfect edit. It's very rare that you would cut to the exact angle at exactly the right time on your first try (although happy editing "accidents" have been known to happen). Instead, think of this as your rough cut. You'll now need to refine the edit.

Adjusting a Multicamera Edit

Now that you have completed your rough cut, when you review it you'll probably notice two main issues: you've made a cut at the wrong time, or you cut to the wrong angle. Even worse, it could be both issues!

Fear not. You're not directing live television here; this is post-production so you can change your mind before anyone has seen your previous "creative choices." In fact, you already know how to change an existing cut point by simply performing a rolling trim using any one of several techniques.

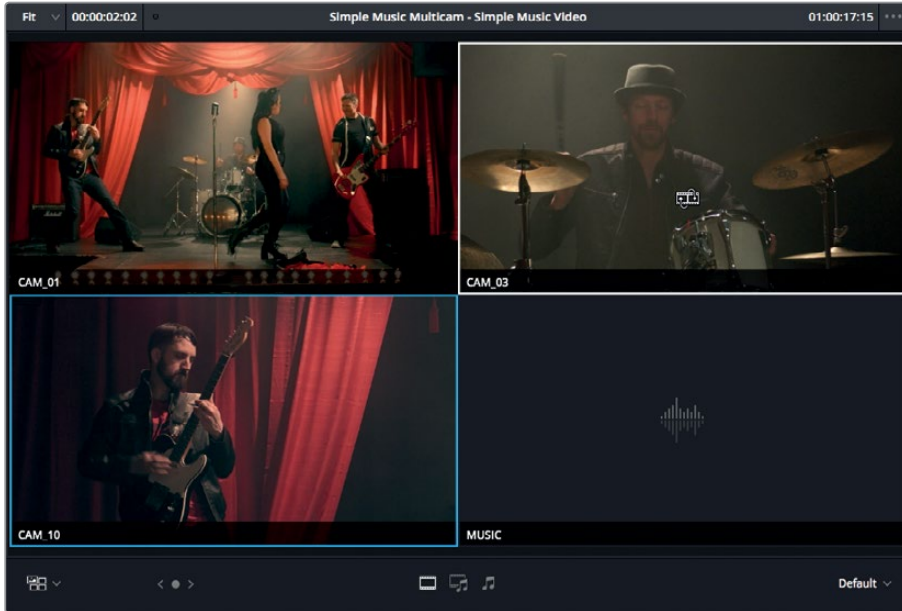
TIP When working with a multicamera edit, you need to be very mindful of the sync between the angles. For this reason, it's probably not advisable to begin rippling, slipping, or sliding shots until you are confident you have mastered those edits.

Previously, when working on the multicamera interview, you switched the angles in the timeline. When you have more than two angles, it's easier to switch angles in the source viewer as in the next exercise.

- 1 In the timeline, play your multicam edit until you see a shot you want to change, then stop playback.

As the edit plays, the source viewer will also update because, in multicam mode, the source viewer is automatically ganged to the timeline playhead position.

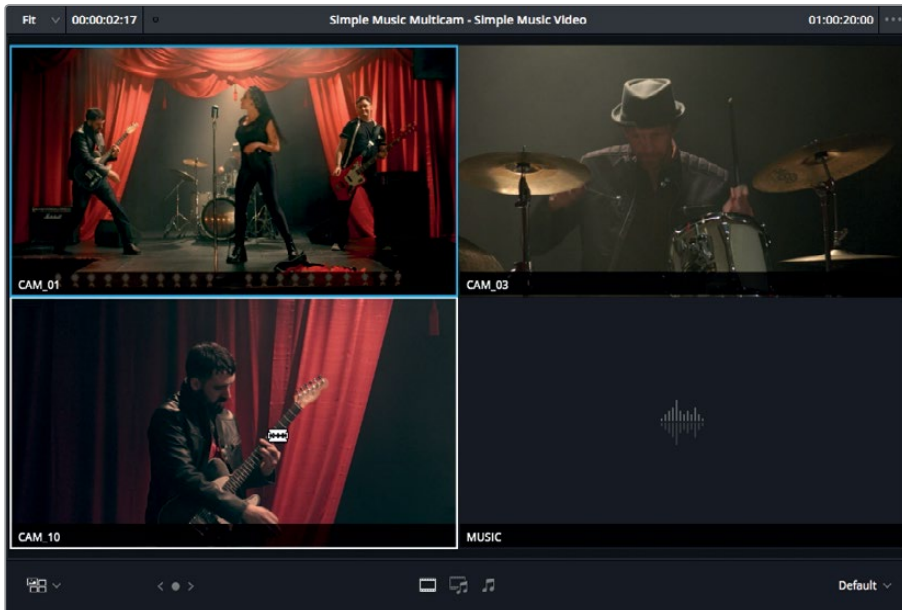
- 2 In the multicam viewer, Option-click (macOS) or Alt-click (Windows) a different image to switch the active angle to the new angle.



When you're switching the active angle, the mouse pointer changes to a replace edit icon.

It's just as easy to add further cuts to your multicam edit too.

- 3 In the timeline, move the playhead to the middle of one of the multicam clips, and in the source viewer, click any other angle.



A new edit point appears at the playhead position in the timeline and changes the rest of the multicam clip after the cut to the new active angle.

TIP Pressing the number keys at the top of your keyboard (1, 2, 3, and so on) makes a cut at the playhead position in the timeline. Pressing Option-<number key> in macOS or Alt-<number key> in Windows) switches the multicam clip angle at the playhead position in the timeline. You can perform either of these operations during playback or when the playhead is stationary.

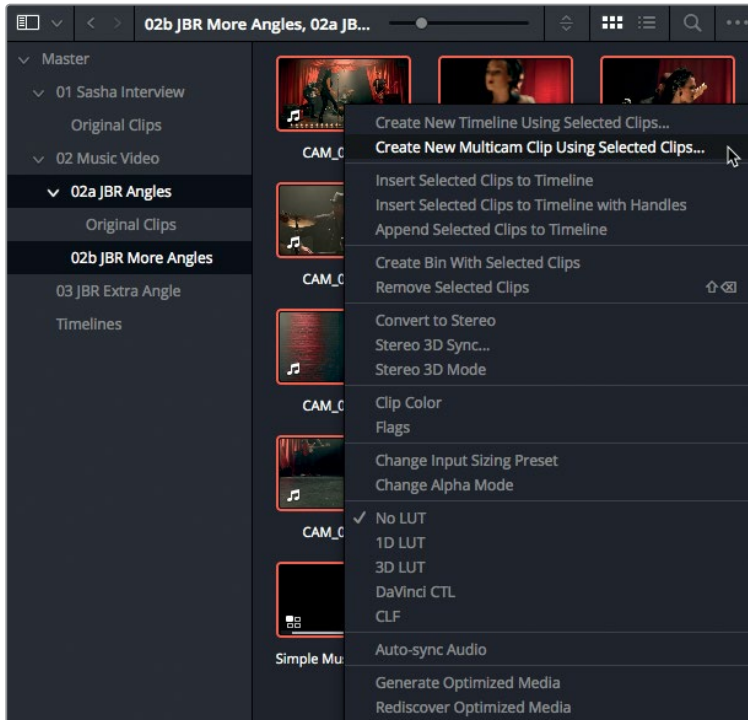
Excellent. Now that you've got a real taste of how much fun multicamera editing is, and how it works in Resolve, it's time to look at a more complex editing challenge.

Complex Multicamera Editing

Editing a multicamera clip with three or four angles is very enjoyable and relatively straightforward. Things become much more challenging when dealing with multicamera shoots that used more cameras.

Understanding some of the issues that you may encounter during a complex multicamera edit is essential to learning how you can begin to solve these problems.

- 1 Select the Timelines bin, and press Cmd-N (macOS) or Ctrl-N (Windows) to create a new timeline. Name this timeline **Complex Multicam**.
Again, this new timeline replaces the previous timeline in the timeline window.
- 2 Select the 02a JBR Angles bin, and Cmd-click (macOS) or Ctrl-click (Windows) the 02b JBR More Angles bin.
- 3 Press Cmd-A (macOS) or Ctrl-A (Windows) to select all the clips in these bins, and choose New Multicam Clip Using Selected Clips.



Even though the 02a Simple Multicam bin already contains a multicam clip from the previous exercise, Resolve will ignore it when you are making the new multicam clip. You can always Cmd-click (macOS) or Ctrl-click (Windows) to remove it from the selection, if you wish.

- 4 In the window that opens, change the name of the multicam clip to **Miserable Girl**.
- 5 Set the Angle Sync to Sound

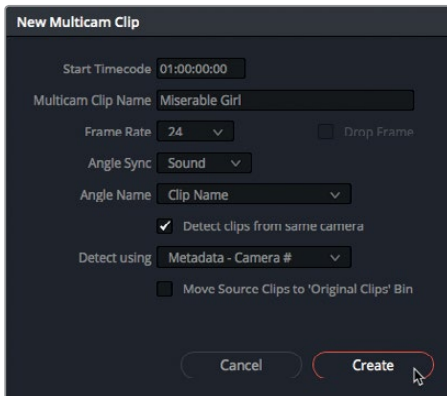
Although synchronizing clips using sound is a great method, you can also synchronize clips using timecode, in points, out points, or clip markers. These other methods are useful when, for whatever reason, the source clips were recorded without sound or with poor-quality reference audio

- 6 Set the Angle Name to Clip name.
- 7 Select “Detect clips from same camera”.

Doing so ensures that Resolve will look at the metadata for each clip and see if any of the clips share a camera number or name. When they do, those clips are treated as a single angle in the multicam clip and sorted based on timecode.

TIP The camera number metadata is located in the Shot & Scene category of the metadata panel.

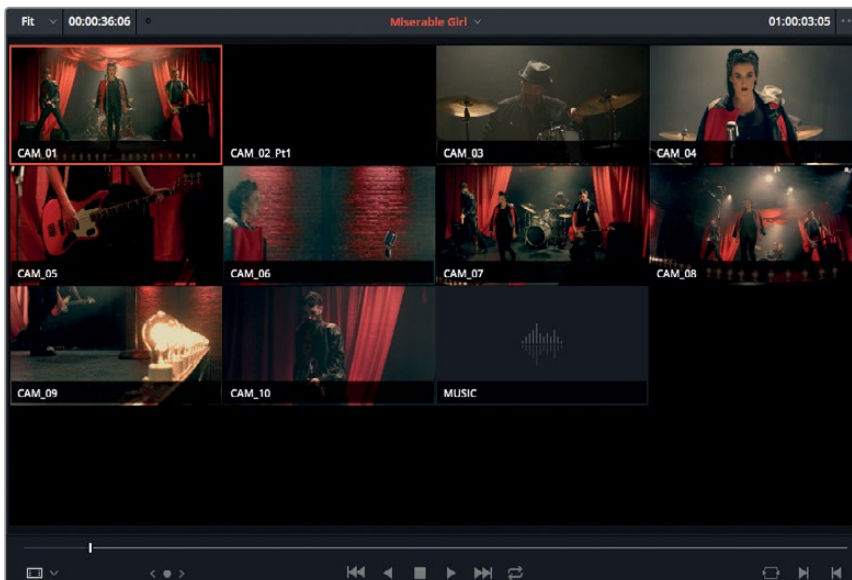
- 8 For this example, deselect “Move Source Clips to ‘Original Clips’ Bin” to leave the source clips where they are and click Create.



The **Miserable Girl** multicam clip is created and placed in the uppermost selected bin.

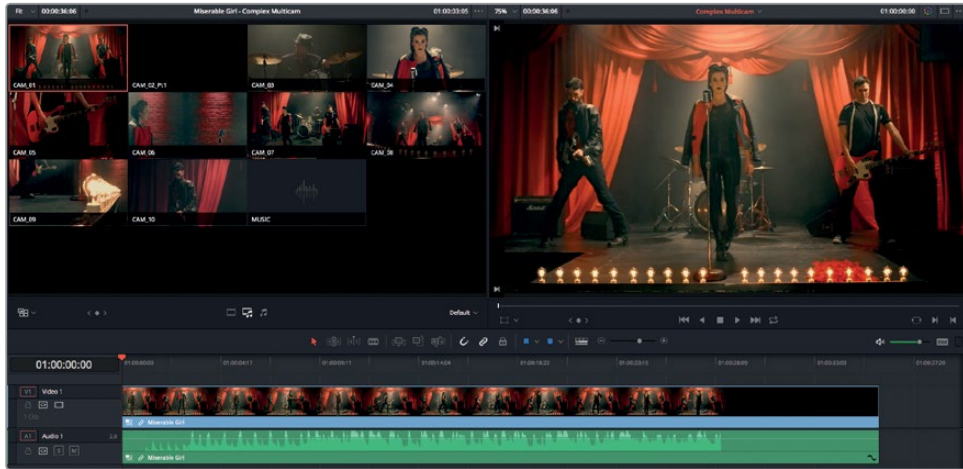
TIP If you can't easily find your multicam clips, this project already includes a Multicam Clips Smart Bin.

- 9 Double-click the **Miserable Girl** multicam clip to load it into the source viewer.
- 10 In the source viewer, set an in point just before the music starts at 01:00:03:05, and overwrite the clip into the Complex Multicam timeline.



It is important to edit the multicam clip into the timeline prior to switching to the multicam source viewer because that viewer is designed specifically to work when multicam clips are already edited in the timeline.

- 11 Press Shift-Z and then press Home to return the playhead to the start of the timeline.
- 12 In the source viewer mode pop-up menu, choose Multicam.



- 13 Play through the timeline, keeping an eye on the source viewer to check the sync of all clips.

TIP Black frames are shown at the start and end of some clips because all of the cameras started and stopped recording at slightly different times.

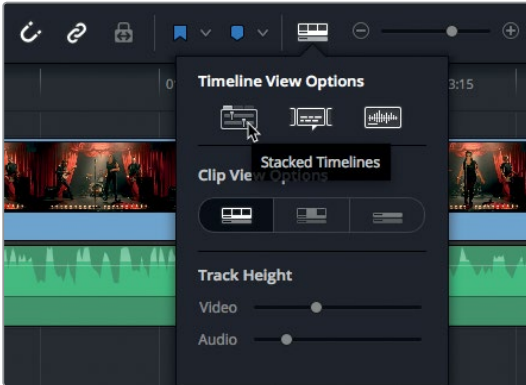
Because the clip name sorting organizes clips alphabetically, CAM 01 is the first clip in the list and is used in the timeline as the default picture and sound reference.

Renaming Tracks

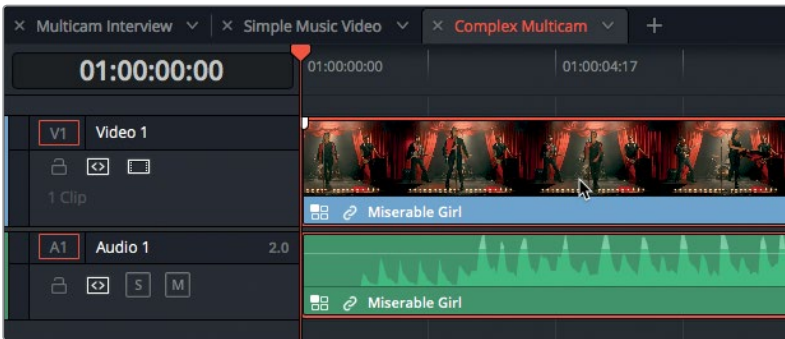
Although the multicamera clip appears as one segment in the timeline, it is actually a type of container timeline, which is very similar to a compound clip. You will work more with compound clips in Lesson 06; but for now, it's useful to know that you can open a multicam clip in its own timeline when you need to make changes, such as altering an angle name.

You can use the pop-up menu in the timeline header to rename angles to be more descriptive and helpful. However, renaming is available only when you expand the track view in the Timeline View Options menu.

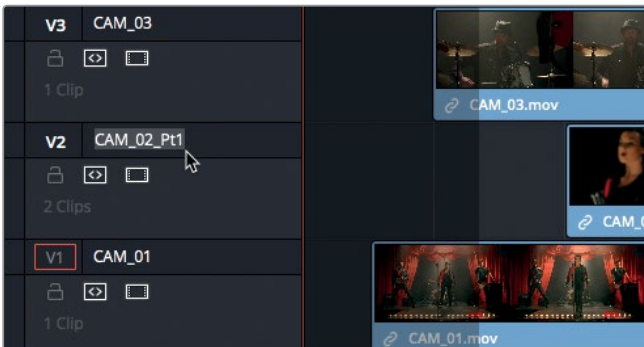
- 1 In the Timeline View Option pop-up menu, select stacked timelines.



The timelines you worked on across this project now open as individual tabs.



- 2 In the timeline, right-click the **Miserable Girl** clip, and choose “Open in Timeline”.
The multicam clip opens in its own tabbed timeline and you can see how Resolve has structured and organized it. The organization is simple: any content on the Video 1 track is displayed in the multicam viewer as Angle 1. If content is present on Video 2, it is displayed as Angle 2, and so on. The same naming convention applies to the audio clips. Notice that the track names follow the names of the original clips.
- 3 In the timeline header for the V2 track, click the name **CAM_02_Pt1**.

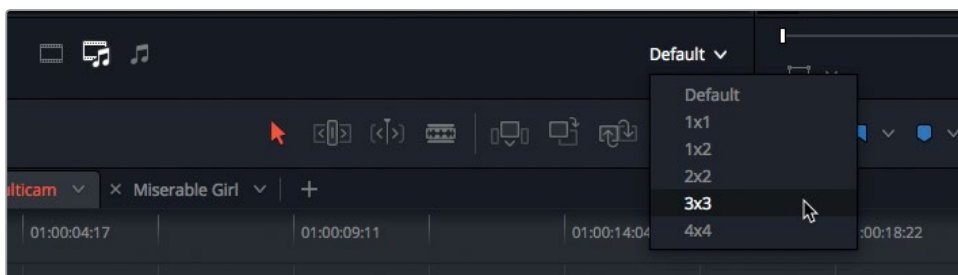


- 4 Rename the track to **CAM_2**.
- 5 Click the timeline tab for the Complex Multicam timeline, and in the multicam viewer, verify that the name of the second angle is updated.

Rearranging Angles in the Viewer

When viewing the order of angles in the multicam viewer, you may deem some angles less important and some more important. Sometimes these superfluous or less-important angles clutter your screen and distract you from selecting the angles you actually want. You can limit the number of angles displayed in the viewer using the multicam display pop-up menu.

- 1 In the lower-right of the source viewer, click the multicam display pop-up. You can choose how many angles are displayed by selecting one of the grid options.
- 2 Choose 3x3 to display three rows of three columns for a total of nine angles in the viewer.



TIP Limiting the number of displayed angles can also improve playback performance on slower computers.

The source viewer organizes the angles into pages to provide access to the additional camera angles.

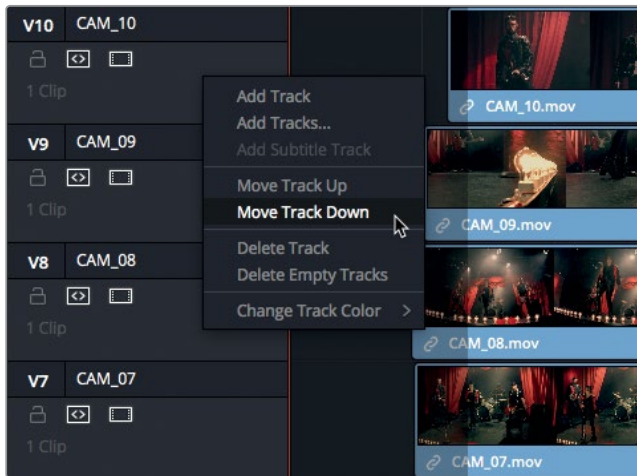
- 3 Click the right page control arrow to display additional angles.



This page displays angle CAM_10; a nice shot of the lead guitarist. You might want this important close-up shot on the first page, so let's relocate that angle in the track order.

- 4 In the timeline, click the Miserable Girl tab.

- 5 Scroll up to locate the CAM_10 track, right-click the timeline header, and choose Move Track Down.



Doing so swaps the CAM_10 and CAM_9 angles in the track order, which should also move the guitarist onto the first page.

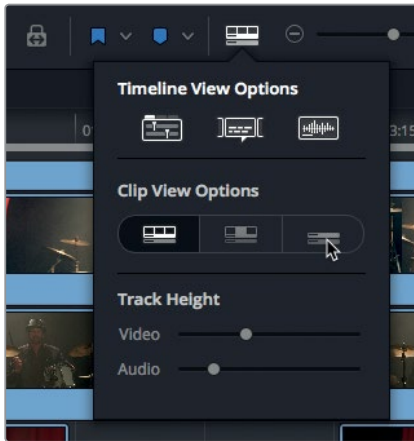
- 6 Click the Complex Multicam tab to return to the main timeline.

In the source viewer you'll see that CAM_10 has switched places with Cam_09.

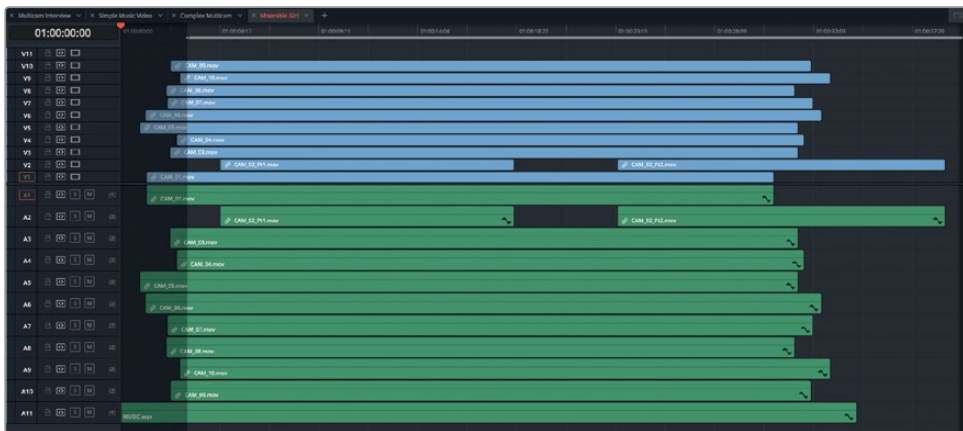
Adding New Angles

Another reason you may need to open a multicam clip in its own timeline is to add additional angles that you were not able to add when you created the multicam clip. For example, you may have created the original multicam clip using sync'd timecodes, but had one clip that didn't have the proper timecode. In a situation like this, it's useful to know that you can manually add angles after the multicam clip has already been created.

- 1 In the timeline, click the timeline tab for the **Miserable Girl** multicam clip timeline.
- 2 Click the Timeline View Options button, and select the rightmost clip view option. Press Shift-Z to fit the entire timeline in the window.



This arrangement collapses all the tracks to a small size, leaving you the maximum amount of space to move tracks around in the timeline.



NOTE Notice that CAM_02 contains two clips. These two clips were captured by the same camera and placed on the same track according to their timecode based on the Angle Name option you selected when creating the multicam clip.

- 3 In the Media pool, select the 03 JBR Extra Angle bin.
- 4 Open the **New Angle.mov** clip into the source viewer.
This clip is a low-angle shot of the entire stage that is missing from the original multicamera angles.
- 5 Position the jog bar at the start of the source clip, and press Shift-down arrow to jump to the first marker. Press I to add an in point.

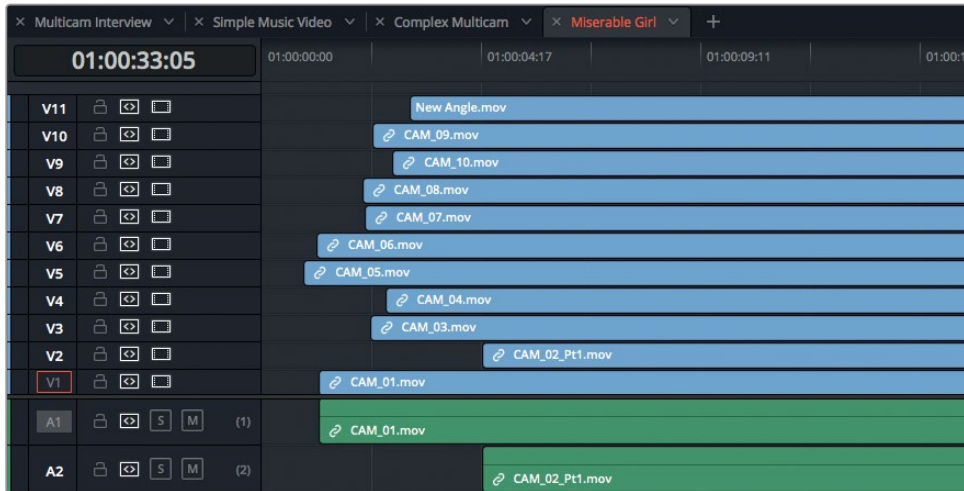
This marker was placed at the start of the music for you. Having it in place makes it quicker to sync this angle with the multicamera clip.



- 6 In the **Miserable Girl** multicam clip timeline, position the playhead at the start of the music at 01:00:03:05. The in point set in this timeline is the original in point that you set prior to editing the multicam clip into its own timeline.
- 7 Press Option-Command-1 (macOS) or Alt-Ctrl-1 (Windows) to disable the A1 source control, or disable the source control for A1 in the timeline track headers.



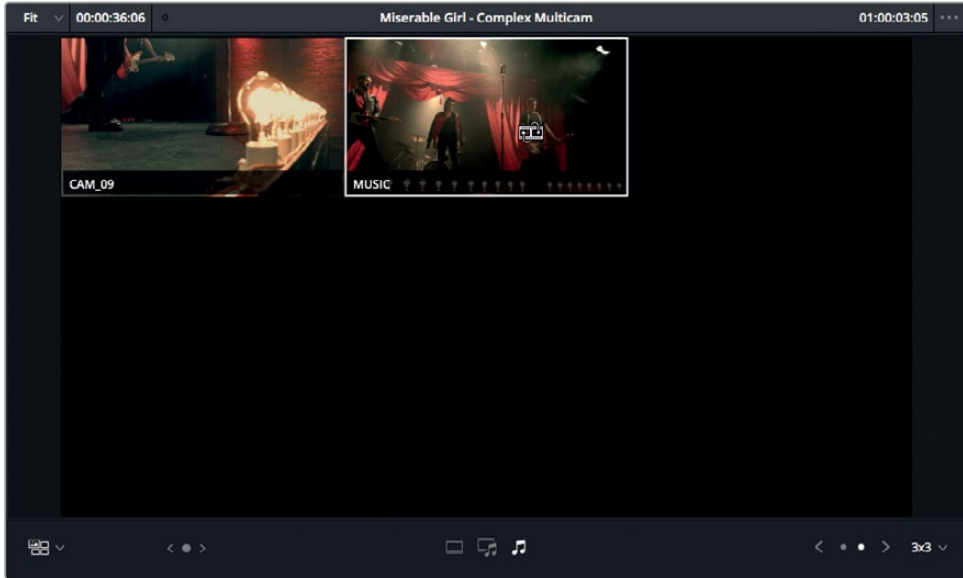
- 8 Press F12 to perform a place on top edit, and edit the clip in track V11 (the lowest free track) so this clip starts at the correct position.



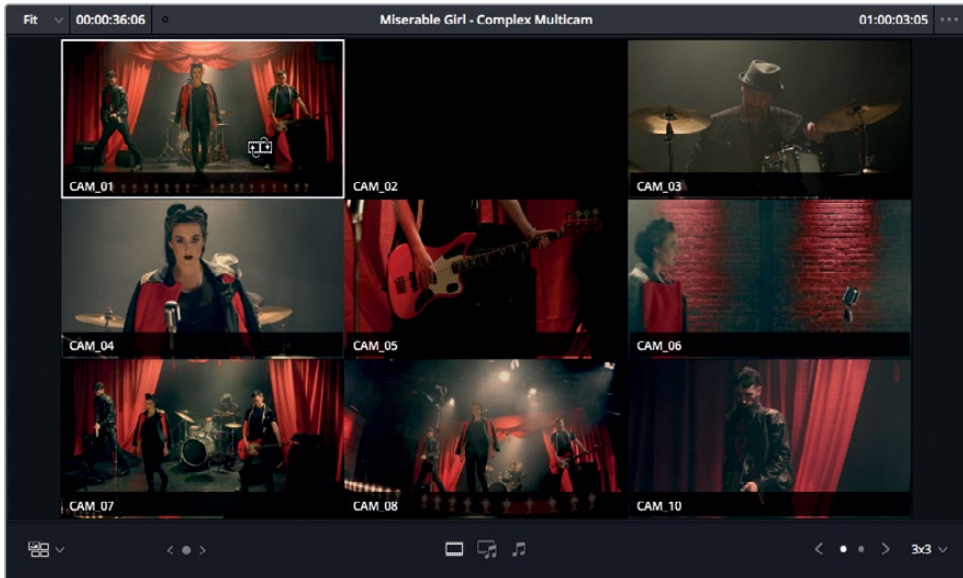
A new angle is added to the multicam clip. You can use the standard slip and slide trimming tools, as necessary, to refine the sync relationship of this clip with the music.

NOTE While a place on top edit will normally create new video and audio tracks as necessary, in this case, an empty V11 track was already in the timeline. V11 was empty because Angle 11 in this multicam clip is used for the music track which has no video. By manually adding the new video-only angle to the empty V11 track, both clips now display as the 11th camera angle in the viewer.

- 9 In the timeline, close the Miserable Girl tab. You have finished changing your multicam clip for now.
- 10 In the source mode pop-up menu, re-enable the multicam viewer.
- 11 Click the Timeline View Options button, and click the button to enable audio waveforms. Choose other timeline view options to suit yourself.
Ok, back to the fun bit. It's time for you to do some more multicam editing!
- 12 In the multicam viewer, click the audio-only button, switch to page 2, and Option-click (macOS) or Alt-click (Windows) the MUSIC angle to switch the multicam clip audio to the music track.



- 13 Switch to page 1, click the video-only button, and Option-click (macOS) or Alt-click (Windows) CAM_03 to switch the picture to this first starting angle.



- 14 Return the playhead to the start of this timeline.
 15 Click play, and start editing!

When you have played to the end of this multicam clip, go back through your edit and refine it by rolling the edit points, switching existing angles, and adding new cuts. Don't forget the two additional angles on the second page in the multicam viewer! Although your instincts might tell you to flatten the timeline and remove all of the unused angles, consider that color grading can be easier when opening a timeline and grading each track instead of grading clip-by-clip.

When editing multicamera projects and playing back in real-time, you are really trying to assess the rhythms and themes of the music and capture those characteristics as you are cutting. Sometimes you might cut a multicam clip in three or four ways to experiment with various pacing strategies and later decide which one is showing the most love; but as with all editing, each cut requires constant revisiting and reworking to ensure that your audience is watching the best possible results.

Lesson Review

- 1 What options do you have for synchronizing angles in a multicam clip from video clips without sound?
 - A) Use in or out points
 - B) Use markers
 - C) Use timecode
- 2 What is the maximum number of angles you can view simultaneously in a multicam clip?
 - A) 16
 - B) 18
 - C) 28
- 3 What modifier key is held down to switch the entire multicam clip to another angle instead of adding a new edit point?
 - A) Command (macOS) or Control (Windows)
 - B) Option (macOS) or Alt (Windows)
 - C) Shift
- 4 True or False? You cannot change the order of angles, add additional angles to an existing multicam clip, or change the current order of the angles.
- 5 True or False? When you choose to flatten a multicam clip, you lose all the other synchronized angles.

Answers

- 1 A., B., and C. You can choose to synchronize angles using in points, out points, timecode, or markers instead of sound.
- 2 A. 16. You can have multiple pages of more angles, but the maximum number of angles you can view in any one page is 16 (4x4).
- 3 B. Option-click (macOS) or Alt-click (Windows) an angle to switch the existing angle.
- 4 False. Right-click a multicam clip, and choose Open in Timeline to adjust an existing multicam clip.
- 5 True. Flattening a multicam clip removes all the unused angles and leaves only the clip that was used in the active angle in the timeline.

Lesson 7

Creating Multilayered Composites

Multilayered promotional videos, or *promos*, combine video, audio, motion graphics, and text into a seamless animated storyline. While creativity and imagination make every promo unique, the ultimate goal still comes down to clearly conveying the message.

You can apply the layering, graphic, and animation techniques you learn in this lesson to commercials in which you need to quickly persuade viewers to engage with a business. These techniques also come into play when creating educational content that needs to explain difficult or complicated concepts in an easy-to-understand way.

Because motion graphics communicate important messages, they must be easily grasped by the viewer. As a result, you strive for clarity and simplicity. The visual effects that you include, movement you create, and colors you choose must enhance the overall clarity of the piece. By doing so, you create an animation that communicates its message effectively to the target audience.

This lesson will introduce the compositing and animation features available to you in DaVinci Resolve 15's Edit page. As an editor, you will often be required to build composites and apply some level of keyframe animation. Then, you, or a motion graphics artist, can use that composite as a guide, or *previz* (previsualization), for further work in the Fusion page or Fusion Studio.

Time

This lesson takes approximately 75 minutes to complete.

Goals

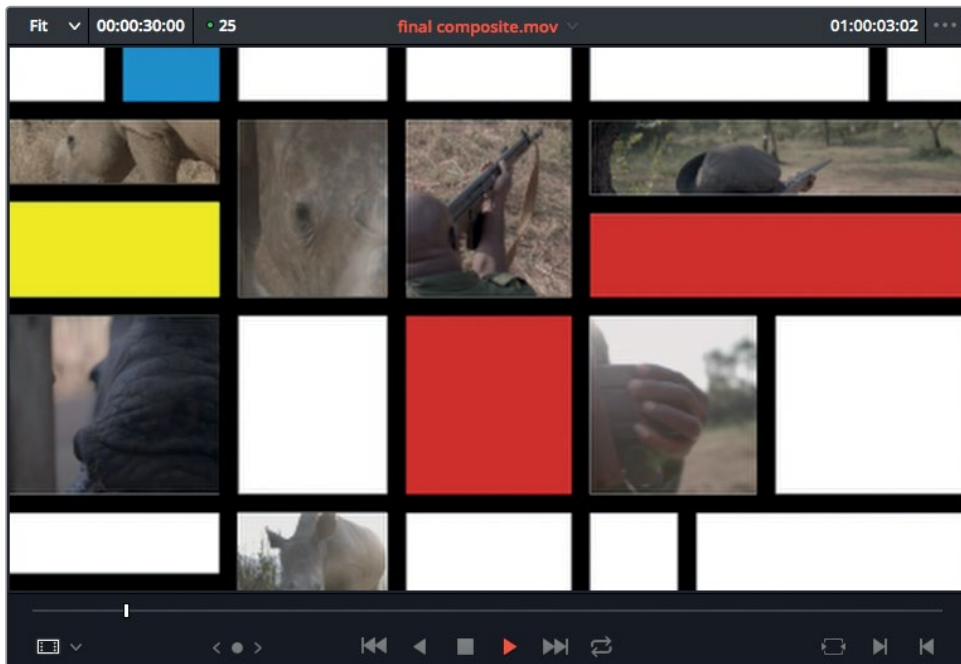
Roughing out your Vision	200
Working with Graphics	218
Working in a Compound Clip	223
Improving Multi-layered Performance	231
Adjusting Keyframes	233
Lesson Review	239

Roughing out your Vision

To ensure the clarity of your multilayered promo, you must have a vision for the project before you even begin. Unless you fully define what you need to communicate, it will be very difficult for you to choose the right approach.

The goal for this promo is to create a multilayered, thirty-second promotional piece incorporating multiple video layers into an animated wall of pictures. Before you actually start putting your promo together, let's look at the style you will want to use.

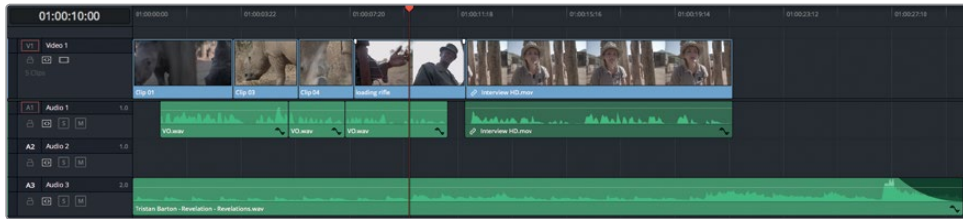
- 1 In the Project manager, right-click and choose Import. Navigate to Rhinos Compositing. Select R15 Editing Lesson 07 Compositing.drp, choose Open, and then click OK to import the project into your Project manager.
- 2 Open the project, and relink media files.
- 3 In the Edit page, in the Master bin, double-click the **final composite** clip, and play it.



This clip is a multilayer graphic promo like the one you will create. As you can see, to realize a project such as this, you need lots of images visible at the same time, and they must be stacked on top of each other using multiple timeline video tracks.

The vertical placement of clips is best dealt with after you have determined when the most important shots should be seen. So, let's take a closer look at the starting timeline which roughs out the basic structure of the promo but is still missing a few elements.

- 4 In the timelines bin, double-click "01 start timeline".



- 5 Play the timeline from the start to review the current edit.

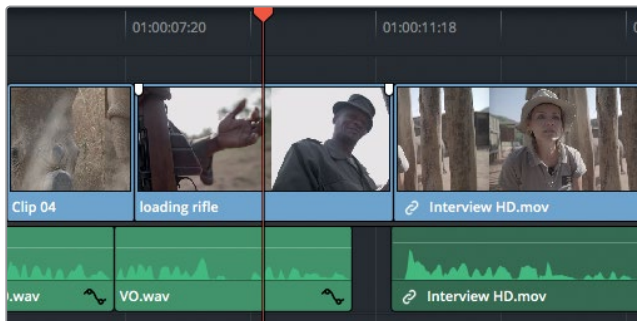
This timeline already has most of the voiceover (VO) in place, along with some music and b-roll clips. In the next exercises, you'll continue building out the narration and adding more of the b-roll clips.

Recalling Previous Clips

When you are cutting VO for a promo, you often bounce between two or three takes. As you switch back and forth, it helps to know a few fast ways to return to clips that you used previously.

This timeline contains a sentence from the VO source clip that you would like to use. The easiest way to locate and load the VO clip into the source viewer is to match frame it from an existing VO clip in the timeline.

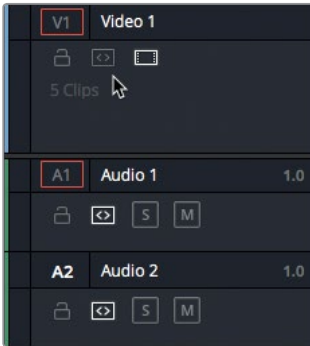
- 1 In the timeline, ensure that the playhead is over the third **VO.wav** clip on track Audio 1, just before the on-camera **Interview HD** clip.



To successfully match frame and find the desired sentence, you need to indicate which track DaVinci Resolve 15 should be examining. You can set the correct track for the match frame by disabling auto select on all of the tracks above the track you want to match frame to, which in this case is Audio 1.

NOTE You can also manually select a clip to match frame to, irrespective of the auto select controls focus.

- 2 Click the auto select button to disable auto select for Video 1, or press Opt-F1 (macOS) or Alt-F1 (Windows).



- 3 In the lower-right corner of the timeline viewer, click the match frame button, or press F, to perform a match frame operation.

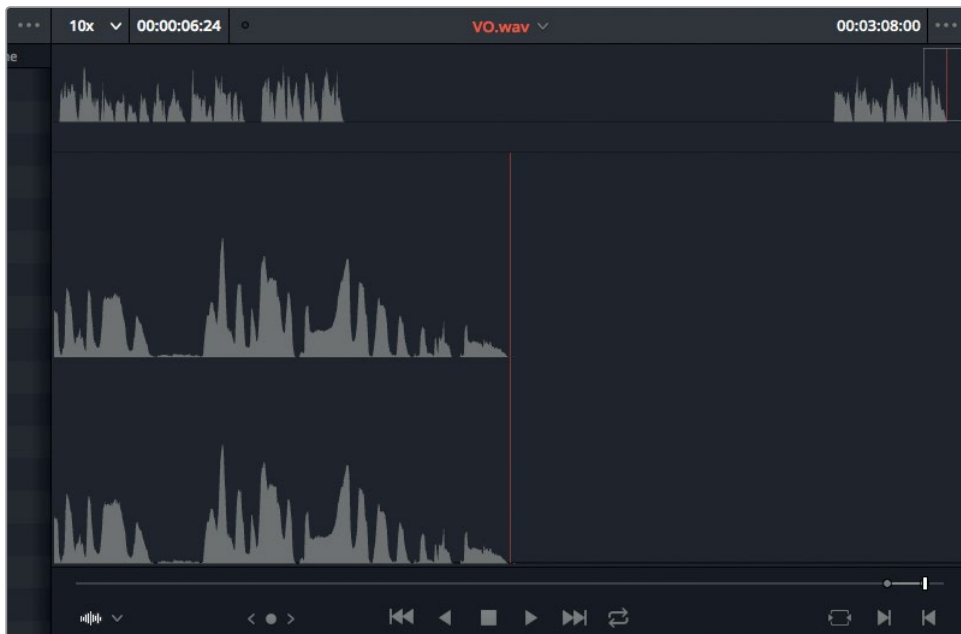


TIP You'll also find a match frame button under the source viewer with which you can locate the current source frame in the timeline.

The match frame function loads the clip under your timeline playhead and on the highest auto select-enabled track into the source viewer. This simple action saves you the trouble of tediously searching through the Media pool to locate the clip you have already used.

TIP When you want to locate a particular timeline clip in the Media pool, select the clip in the timeline, and choose **Clip > Find Clip in Media pool**; right-click the clip, and choose **Find in Media pool**; or press **Opt-F (macOS)** or **Alt-F (Windows)**.

- 4 With the source viewer active, type 3. . (two periods) and press Enter. Pressing two periods is the same as adding two decimal points with zeros. So, it is the equivalent of typing 3:00 minutes. This location is near the starting point for the next clip.
- 5 Press spacebar to play over the ending sentence. You'll use this last sentence as the ending for your promo.
- 6 Return to the three-minute location, and mark an in point before the doctor says, "This is why I continue to fight," at around 00:03:01:00.
- 7 Mark an out point after she says, "Give up on them," at 00:03:08:00.



Now you want to add this VO to the end of your timeline, you'll do so using the append at end edit function.

- 8 Press Shift-F12 to append the clip to the end of the timeline of the targeted audio track.



- 9 Play over the onscreen interview and the audio VO you just added to the timeline to review the edit.

The VO clip was edited directly after the end of the on-camera interview. When cutting a voice element, don't forget that people need to breathe, and for that matter, so does your edit.

- 10 In the timeline, move the playhead anywhere over the new VO.wav clip you just added.
11 Press Shift-V to select the clip.



- 12 Type +10 and press Enter.



You just moved the clip by a relative amount (10 frames) because the plus key was entered before the numerical value. Doing so adds some much-needed breathing space between the two sentences. At this point, take some time to review the entire edit before you move on to the next exercise.

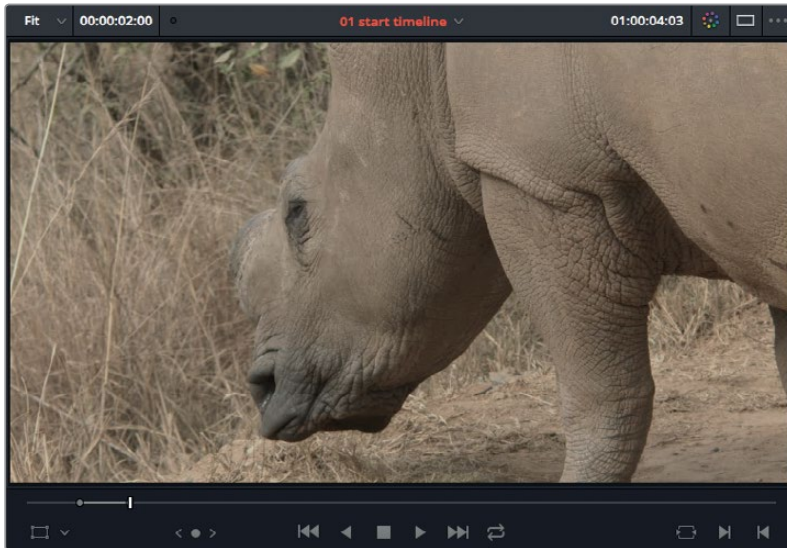
Editing with Fit to Fill

Fit to fill is a four-point edit in which both the source clip and timeline have in and out points. When these two selections have different durations, DaVinci Resolve automatically calculates the rate of speed adjustment required to make the marked duration of the source clip fit into the marked duration of the timeline. This automatic speed change is helpful in promos where you want a particular action to happen within a musical beat or within a certain VO section.

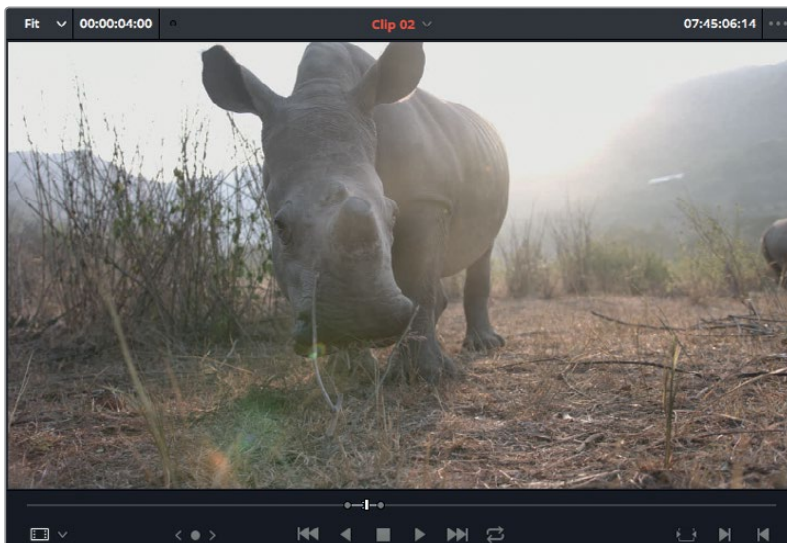
- 1 With the playhead positioned at the start of the timeline, click play, and mark an in point at the third musical beat (at roughly 01:00:02:00).
- 2 Mark an out point on the fifth musical beat (at around 01:00:04:00).



The duration between these marks should be about two seconds, which you can verify in the upper-left duration field in the timeline viewer.



- 3 In the Media pool, select the Media bin.
- 4 Double-click **Clip 02** to load it into the source viewer.

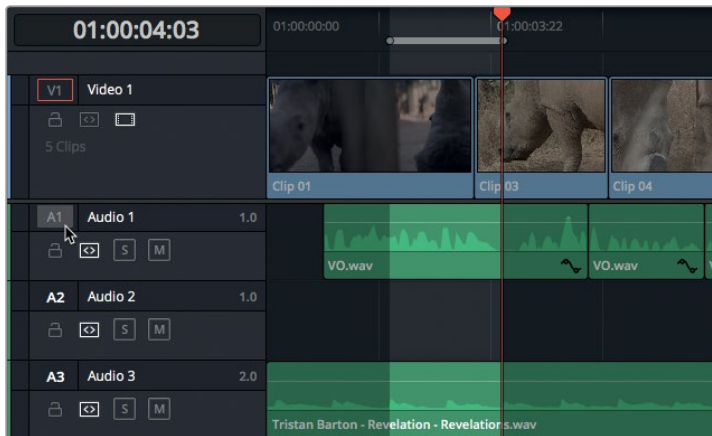


The marks are already set on this clip and ready for you to edit into the timeline with a duration of four seconds. Let's look at the content you are going to use.

- 5 Press Opt-/ (slash) on macOS or Alt-/ (slash) on Windows to play from the in to out points before returning the playhead to its current frame.

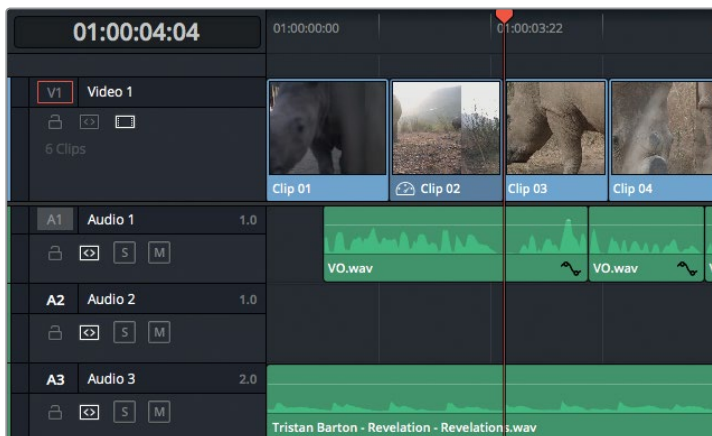
The rhino in this shot moves very slowly. You are going to speed up the shot because you want to fit the full action of the rhino looking up into the two-second duration you just marked on the timeline.

- 6 In the timeline track header, disable the A1 destination control so you edit only the video track.



- 7 Press Shift-F11 to perform a fit to fill edit.

A speed change icon appears on the clip and the clip in the timeline is sped up to fit the four-second source clip into the two-second timeline region.



- 8 Return to the start of the rhino clip in the timeline and watch the edit.

Fit to Fill is an easy edit to make in this way; but in some cases, it can be even easier. If you are performing a fit to fill edit to replace an existing clip in the timeline, you needn't mark in and out points. You can position the timeline playhead over the segment and enable the auto select control for that track. When performing the fit to fill edit, Resolve will automatically calculate the in and out points for the segment.

Aligning Action with a Replace Edit

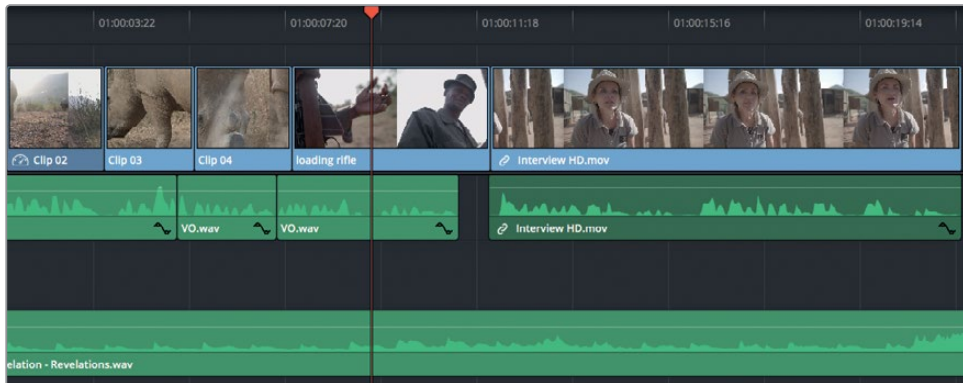
So often in promos, you want multiple pictures to appear on-screen at the same time. To do so, they must be layered vertically on different tracks in the timeline, but at the same time. For your next few edits, you'll stack up clips that will work well together on-screen.

Creatively, the director wants multiple shots of guns firing on screen simultaneously in your wall of pictures. She also wants this moment to occur at a natural pause in the voiceover.

- 1 In the timeline, play from the start of the **loading rifle** clip, and stop at the pause between “It isn't because they dislike you” and before the doctor says, “It's just because they are scared,” at about 01:00:19:15.

This is where the new clip's gunshot should be heard. When performing a replace edit, it's important to position the playhead where you want the sound or action to occur.

- 2 Press the right and left arrow keys to ensure the playhead is positioned between “dislike you” and “it's just because”.



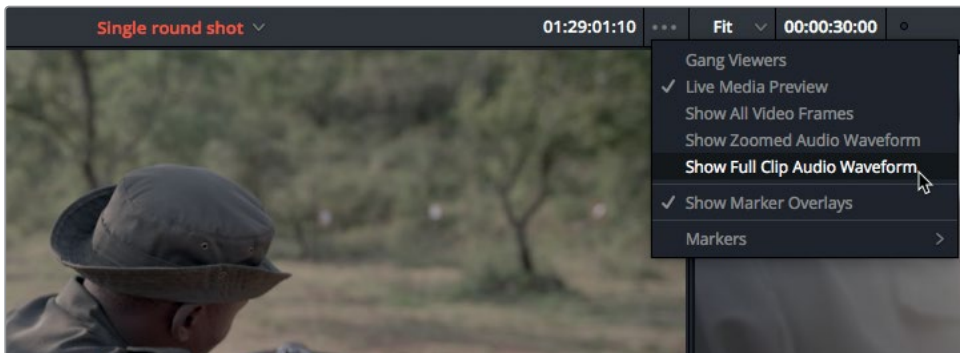
TIP If you will need to locate this exact frame later, you might want to add a clip or timeline marker as a reference.

- 3 In the Media pool, double-click **single round shot** to open it into the source viewer.



At one point, the gun is fired in this clip. You can find it easily using the audio overlay in the source viewer.

- 4 In the options menu above the source viewer, choose Show Full Clip Audio Waveform.



By examining the audio waveform overlay, you can easily locate the gun being fired because the shot is the only sound in this clip.

- 5 In the source viewer, drag the playhead directly over the frame where the gun fires.



Using the source playhead, you identified the gunshot as a sync point; and in the timeline, you identified the pause between the doctor's two sentences as the other sync point. You're almost ready to perform a replace edit.

An effective replace edit is all about the playhead's position in the timeline and the source viewer. This placement is critical because when you perform the replace edit, the playhead frame in the source viewer is introduced exactly at the playhead frame in the timeline.

You may already have used the replace edit function to replace an entire clip on the timeline. However, if you add in and out points in the timeline before performing a replace edit, the points can limit the amount of source media handles that is edited on either side of the playhead location.

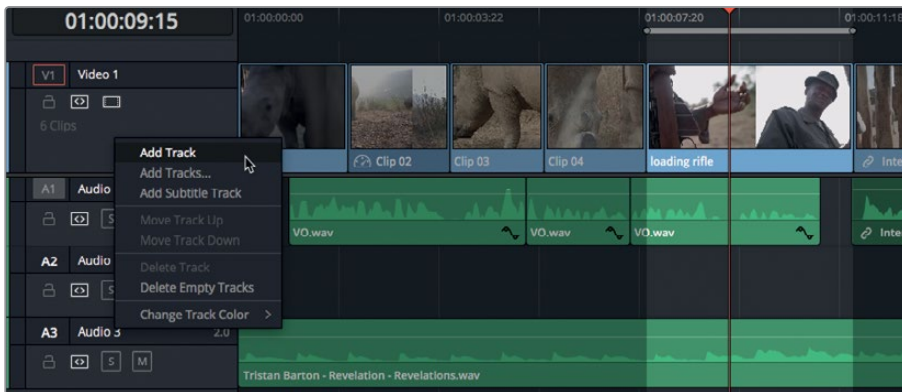
- 6 Press Q to activate the timeline viewer.
- Previously you disabled auto select on Video 1 to match frame to the audio, now you need to enable it on this track to mark the clip's duration.
- 7 Click the auto select button on Video 1, or press Option-F1 (macOS) or Alt-F1 (Windows), to enable auto select for video track 1.



- 8 Choose Mark > Mark Clip, or press X, to mark in and out points for the duration of the **loading rifle** video clip on the Video 1 track.

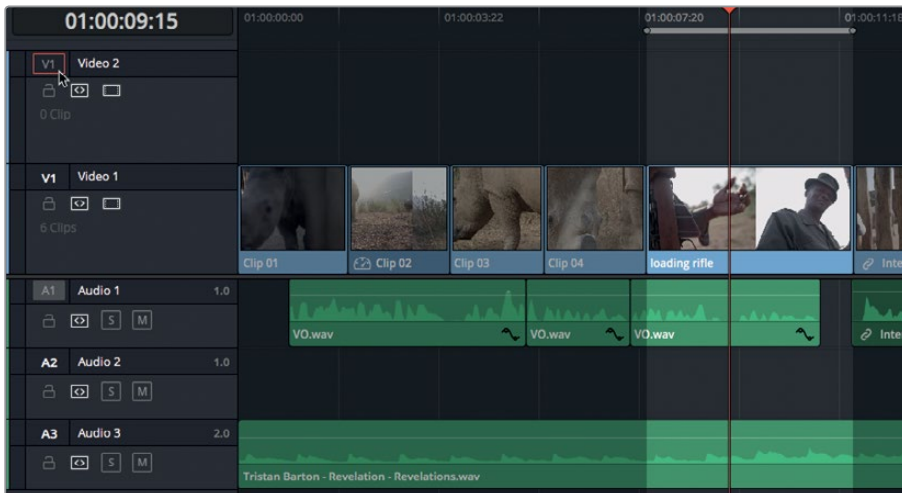
To edit in the new clip and layer it above the loading clip, you need to add a new video track.

- 9 In the timeline, right-click the Video 1 track header, and choose Add Track.



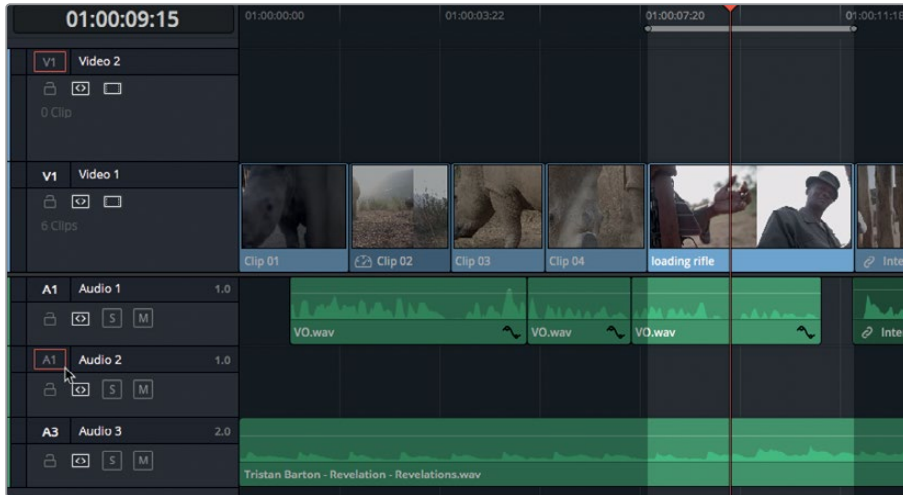
A new Video 2 track is added above Video 1. Now you'll patch the video from the source clip onto Video 2 track.

- 10 Press Option-2 (macOS) or Alt-2 (Windows) to patch the source video to Video 2 in the timeline.



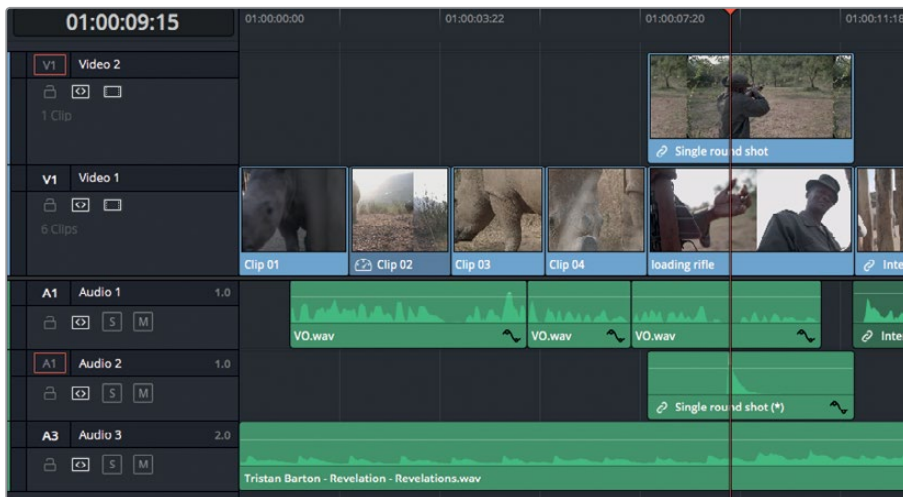
Because you also want the gunshot to be heard, you'll also edit in the audio.

- 11 Press Cmd-Opt-2 (macOS) or Ctrl-Alt-2 (Windows) to patch the source Audio 1 into Audio 2.



With the duration correctly marked, the right tracks targeted, and your playhead in the correct position, you are now ready to perform your replace edit.

- 12 Press F11 to perform a replace edit.



The gunshot clip is now layered on top of the clip on Video 2, and the sound of the gunshot occurs exactly in the pause of the sentence.

- 13 Press / (slash) to review the edit you just made to see and hear the placement of the gunshot.

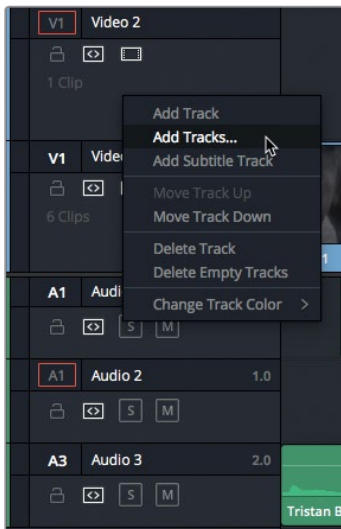
You have one more gun firing shot to add. You'll edit this on another layer above **single round shot**.

- 14 In the Media pool, double-click **two rounds shot** to open it in the source viewer. This clip has two places where a gun is fired. You'll locate the second gunshot using the audio overlay.
- 15 In the source viewer, drag the playhead directly over the frame in which the gun fires.



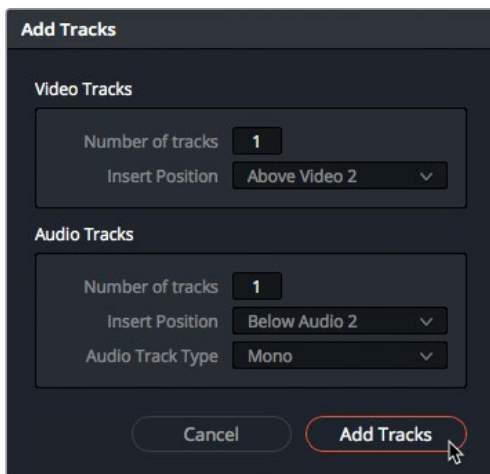
Now you need to patch the audio and video to new tracks in the timeline.

- 16 Right-click anywhere in the timeline header and choose Add Tracks.



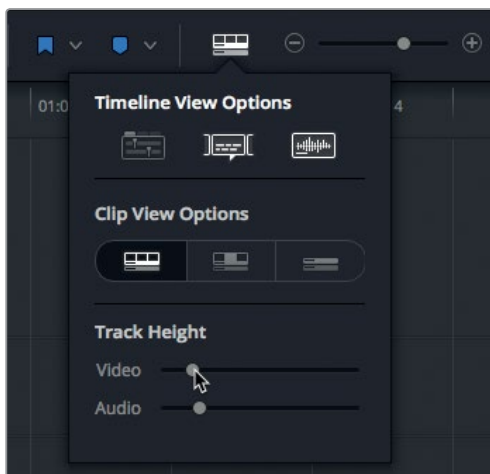
In the Add Tracks dialogue, you can determine how many tracks you're adding and where they are placed in relation to existing tracks.

- 17 In Video Tracks, set the Insert Position menu to Above Video 2; and in Audio Tracks, set the Insert Position menu to Below Audio 2 and the Audio Track Type to Mono.



- 18 Click Add Tracks to add the audio and video tracks.

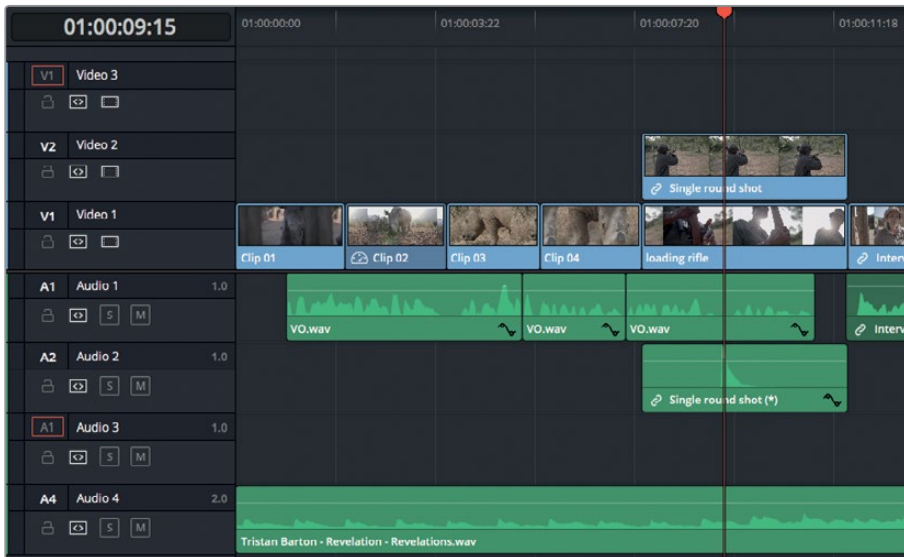
Depending on your screen size, you may need to reduce the size of your video tracks using the Timeline View Options.



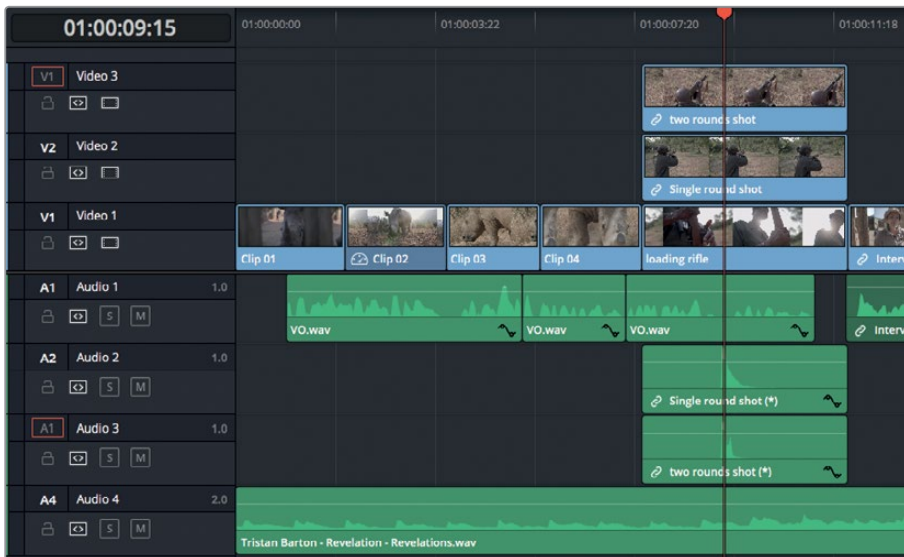
You do not always have to patch to a specific numbered track. You also can quickly patch to the next highest video track by using the up arrow keyboard shortcut.

- 19 Press Cmd-Shift-up arrow (macOS) or Ctrl-Shift-up arrow (Windows) to patch source V1 one track higher to Video 3 in the timeline.

- 20 Press Cmd-Opt-down arrow (macOS) or Ctrl-Alt-down arrow (windows) to patch source A1 on track lower to your new Audio 3 in the timeline.



- 21 In the timeline, make sure your playhead is still over the point where the gun is fired in **Single round shot**.
- 22 Press X to mark the clip in the timeline on the lowest track with auto select enabled (Video 1).
- 23 Press F11 to replace the clips on the targeted tracks.



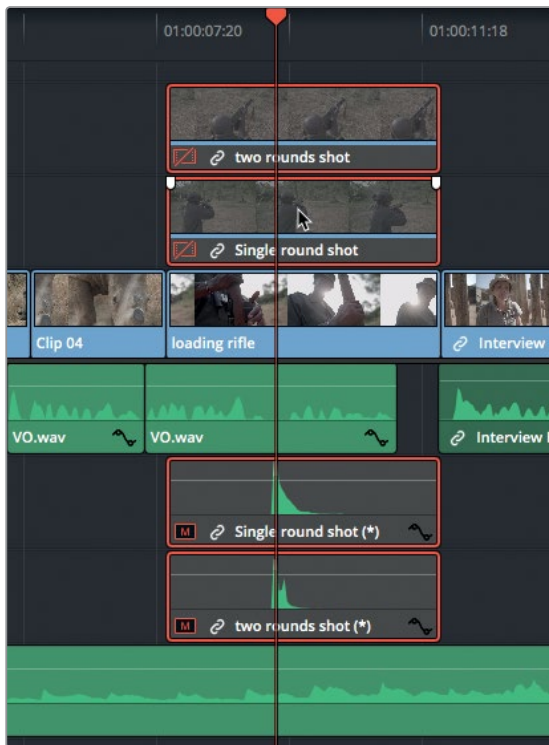
The replace edit is ideal for making edits in which the timing and placement of action is far more important than where the start and end of a clip might happen.

Aligning Action with Slip Edits

You aligned the two gunshot clips using replace edits. But what about aligning actions with sound after a clip is already edited into the timeline? The easiest way to align clips with sound once they are edited is by performing a slip edit.

Let's look at **loading rifle** which is positioned under your gunshot clips on Video 1. Because you cannot currently see **loading rifle** in the timeline, you need to disable the clips on the higher tracks.

- 1 In the timeline, select **single round shot** and **two rounds shot**. Right-click one of the clips, and choose Disable, or press D, to disable the clips.



The two selected clips are no longer visible in the viewer and they are dimmed in the timeline, which reveals the **loading rifle** clip beneath on Video

- 2 Press / (slash) to play over **loading rifle** to view its contents.

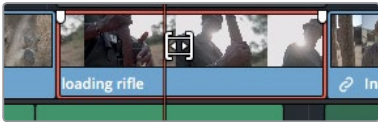
At the start of the clip, the rifleman slaps the cartridge into his gun. Aligning that action with the gunshot sound effect would sync all the visuals very nicely.

- 3 Make sure your playhead is still positioned over the sound of the gunshot on Audio 2. If it isn't, use the waveforms of the guns firing as a guide (or any markers you may have added as reference).

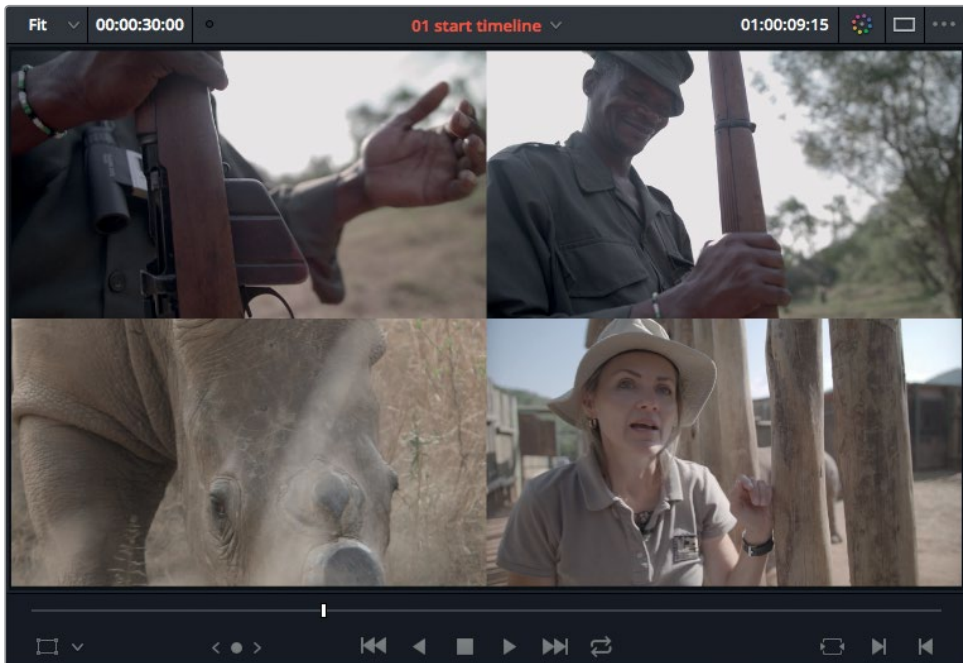


Now you can slip the rifle shot to align with the gun sound effect.

- 4 Press T to select the trim edit mode tool.
- 5 Move your mouse pointer over the thumbnail and click **loading rifle** to select it with the slip cursor, or press Shift-V to select the clip on the lowest track with an enabled auto select control.

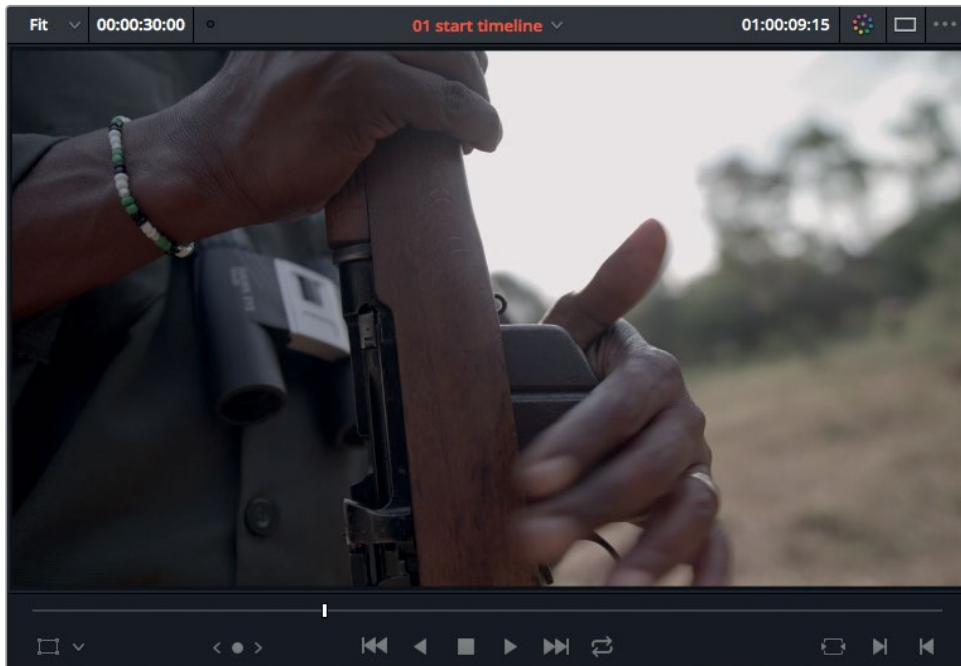


- 6 Tap the , (comma) key three or four times to move the clip three or four frames later.

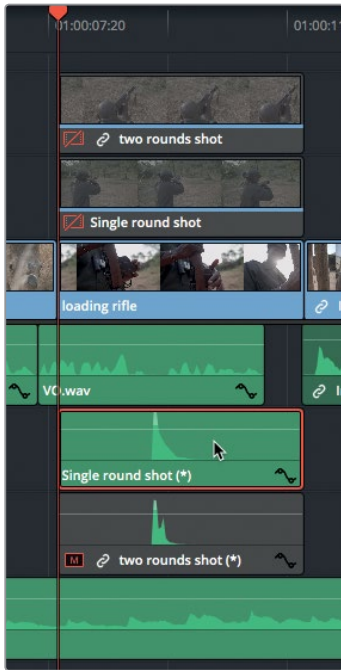


Now you have a problem. By default, the slip tool shows the four-up display in the viewer, which shows only the start and end frames of the clip you are slipping. However, you are not interested in the first or last frame of that clip. You need to see the exact frame under the playhead where your sound effect is located.

- 7 Deselect View > Enable Preview During Editing, or press Shift-Q, to disable the four-up display.
- 8 Now press the , (comma) and . (period) keys to slip the rifle shot to where the gunman smacks his hand on the cartridge.



- 9 Choose View > Enable Preview During Editing or press the Shift-Q again to reenable the four-up display.
To be sure you have the rifle shot aligned with the sound effect, you need to enable the sound effect without enabling the linked video on the higher video tracks.
- 10 Press A key to return to the selection mode tool
- 11 Opt-click (macOS) or Alt-click (Windows) the audio clip on the Audio 2 track to select it without selecting the linked video clip.



- 12 Press D to enable the selected audio clip.
- 13 Press / (slash) play over the selection to see how the rifle aligns with the gunshot.
- 14 Select the remaining two disabled video clips, and press D twice to reenable them.

Now that you have a layered stack of clips, and aligned their actions, all your video elements are edited into the timeline and you can lay out that Mondrian-like wall of pictures.

Working with Graphics

When working on graphical promos, composition must always influence where your images will be placed. Composition also comes into play when deciding what shot to use.

Aesthetically, for a graphic edit such as in the current project, you must constantly assess how the vertically placed elements will work together on screen. Your goal is to make them complement each other, enhance the overall topic at any particular moment, and fit logically with the voiceover.

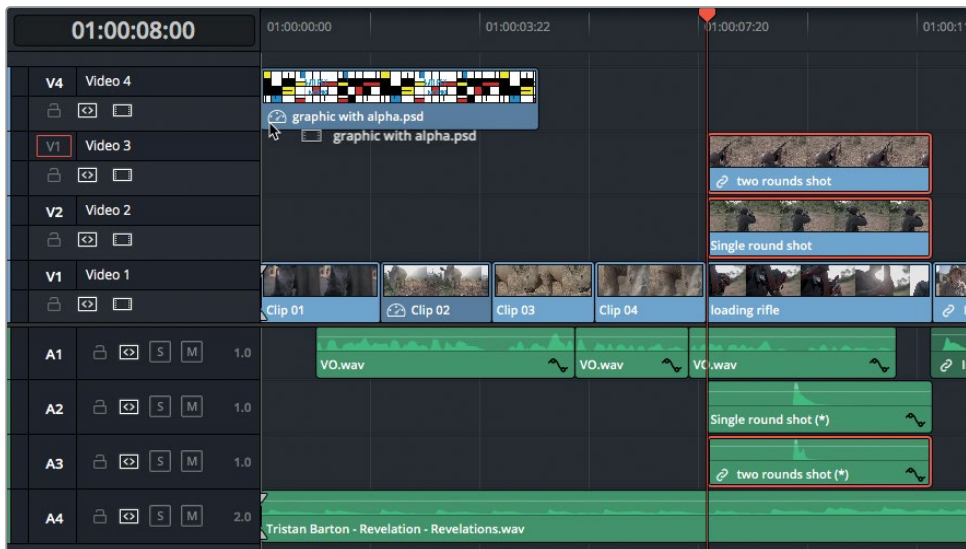
By placing images in expressive temporal and spatial relationships, you can guide the audiences' interpretation of what is presented at any moment in time and heighten the desired emotional response.

The first step in devising your graphic design is to import any graphics that you may want to use. Resolve can import standard graphic file formats including TIF, PNG, JPEG and PSD, including any alpha channels that determine the transparency of an image.

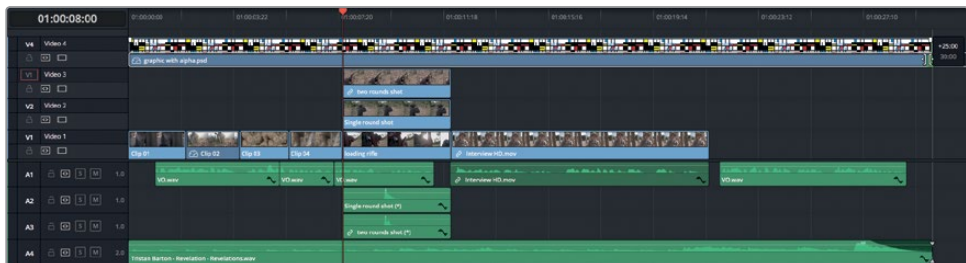
- 1 Select the graphics bin, which is where your imported graphic will be placed.
- 2 Choose File > Import File > Import Media, or right click in the Media pool and choose Import Media. Navigate to R15 Editing Lesson07 > Graphics.
- 3 Select the **.dropzones** file and click Open to import it.

The psd-format graphic is imported into the bin. You can edit this into your timeline and extend it to the duration you need.

- 4 Drag **.dropzones** from the bin to the timeline above the uppermost clip on the Video 3 track. Release the mouse button when a new Video 4 track is added to the timeline.



- 5 Trim the head and tail of **.dropzones** so it extends across the entire timeline from the first clip to the last.



TIP Resolve's default scaling behavior is to fit all images within the timeline resolution. Although this graphic has a much higher resolution than the timeline resolution, it is scaled to fit. This default behavior can be changed in the Project settings > Image Scaling category.

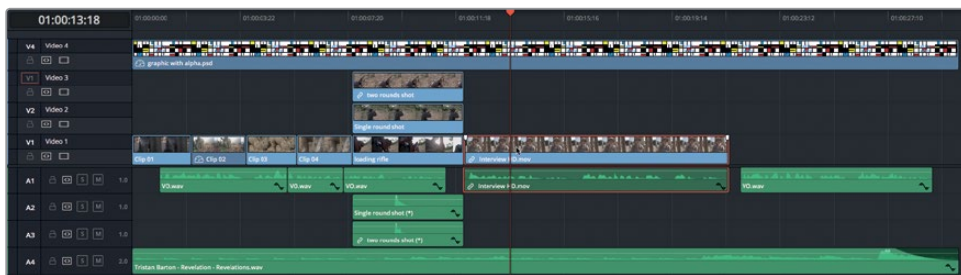
As the name implies (and as you can now see), this graphic has an alpha channel that creates transparency. This channel makes it easy to scale and reposition the video layers under the graphic to fill in the areas of transparency.

TIP To ignore, invert, or modify the type of alpha channel in a graphic, right-click the file in the bin, and choose Change Alpha Mode. Alternatively, you can switch between these same options in the Video tab of the Clip attributes dialogue.

Scaling and Cropping

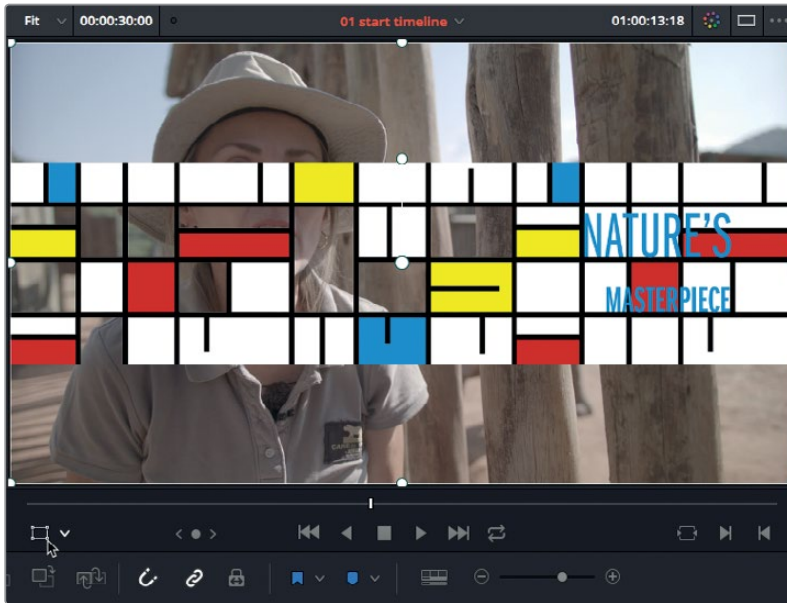
Currently, each image is full raster layered behind the graphic. Using the on-screen scale and crop controls, you can place the images so they appear to fit within the rectangles of your graphic.

- 1 Position the timeline playhead over the **Interview HD** clip, and press Shift-V select it (because it's still on the lowest active auto select-enabled track).

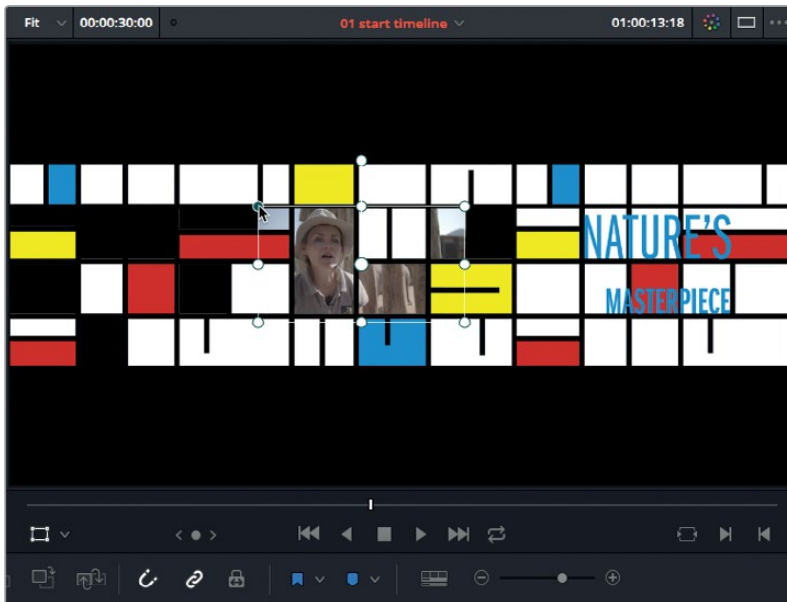


You'll use the on-screen controls to position and crop this interview clip so it fits within one of the rectangles. Because this is your main interview clip, it will go into the largest rectangle in the layout.

- 2 In the lower-left corner of the timeline viewer, click the transform On-Screen Control button to show the wireframe outline.

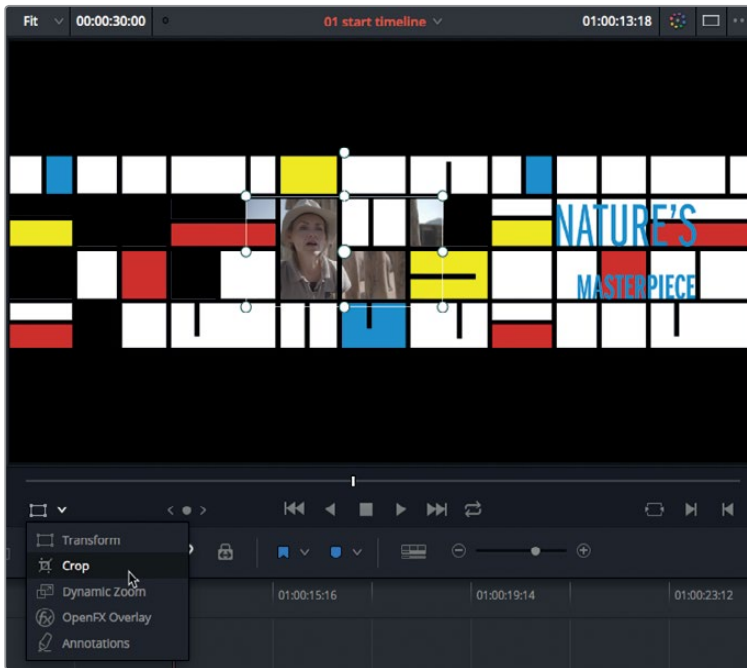


- 3 Drag any of the wireframe's corner control handles to scale down the image and position it so it fits within the long, large rectangle in the center of the graphic.

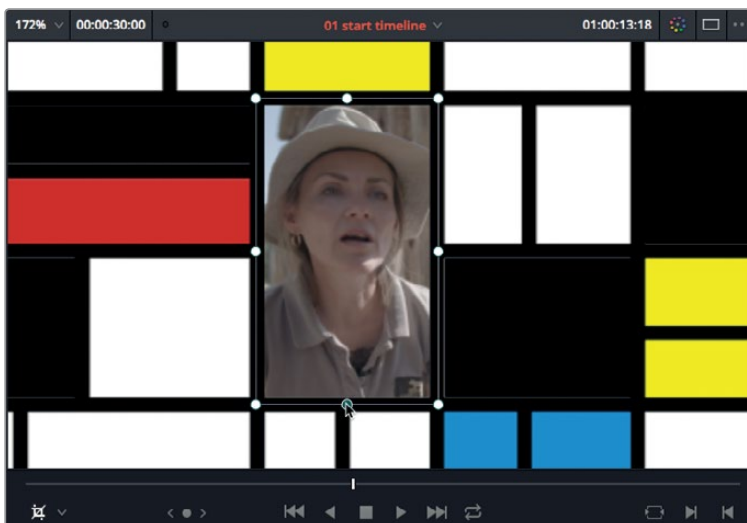


Because the video frame isn't in the same aspect ratio as the rectangular graphic, some of the image edges bleed over into other rectangles. Again, using on-screen controls, you can crop the image to fit perfectly.

- 4 In the lower-left corner of the timeline viewer, click the on-screen control pop-up menu, and choose Crop.



- 5 Drag the upper, lower, left, and right control handles of the wireframe to crop the image until it fits within the rectangular box. If necessary, zoom in on the timeline viewer and hold down your mouse's scroll wheel or middle button to scroll around the image in the timeline viewer.



TIP To nudge the control handles and resize the image in very small amounts, you may find it easier to adjust the settings in the Inspector.

- 6 In the lower-left corner of the timeline viewer, click the crop on-screen control button to hide the wireframe outline, and return the zoom pop-up option to Fit.

One by one, you will scale and crop each image to fit into the open rectangles. It's good practice to do so on this timeline, so feel free to complete these tasks as extracurricular activity. Then, in the next exercise, you'll jump to a new timeline in which all the scaling and cropping was done for you.

Working in a Compound Clip

Your animation will pan from left to right across the graphic and video elements. Of course, whilst you could animate each clip individually in your timeline, the process would be much easier if you could treat all the layers as one. By doing so, you could animate just a single element rather than having to manipulate several different layers and clips. By collapsing all your tracks into a single compound clip, you enjoy the ease of managing a single clip while retaining access to all your edits.

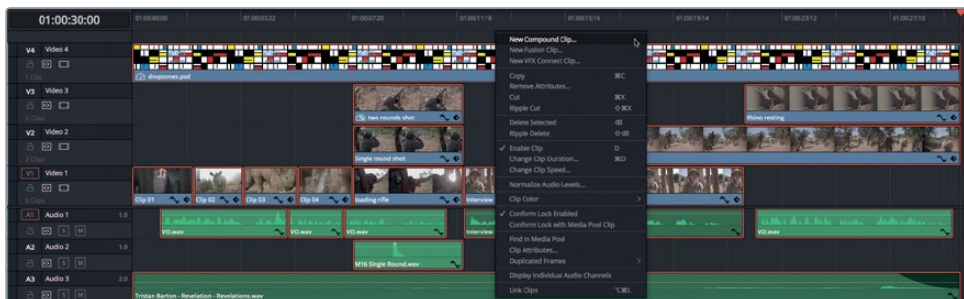
- 1 In the timelines bin, double-click the “O2 cropped” timeline.

This timeline has all the cropping and resizing completed on the remaining clips, as well as a few additional clips. Let's take a quick look.

- 2 From the start of the timeline, play over the first five clips, until the narrator says, “It's just because they are scared.”

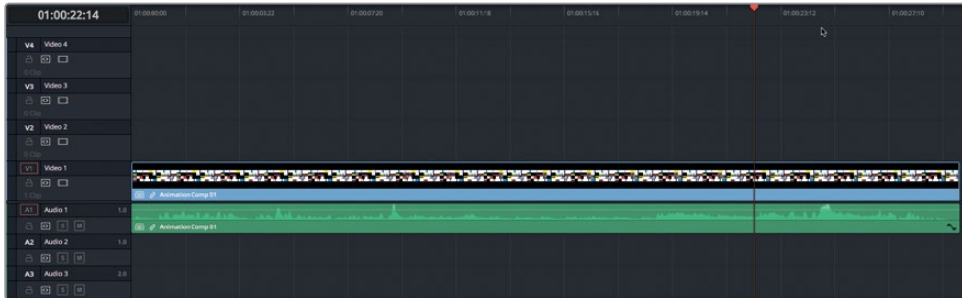
Although the timeline isn't completely done, you can still turn it into a compound clip. Making a compound clip doesn't prevent you from making further changes to your timeline.

- 3 Press Cmd-A (macOS) or Ctrl-A (Windows) to select the entire timeline and all its contents.
- 4 Right-click one of the clips and choose New Compound Clip.

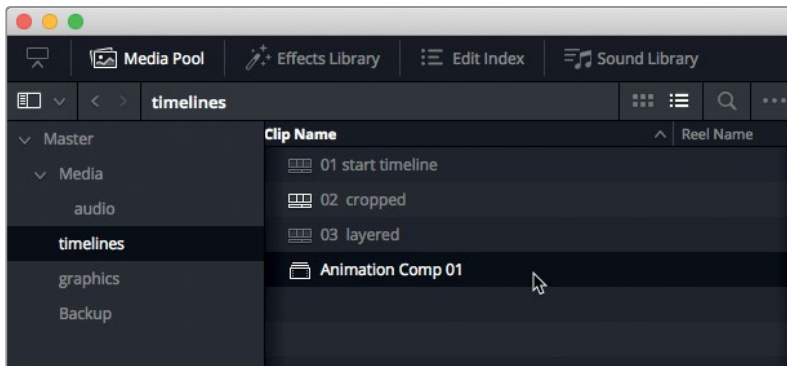


A dialog appears asking you to name the compound clip. Compound clips are treated just like regular source clips. They have names and appear in the current bin.

- 5 Name the compound clip **Animation comp 01**, and press Enter.



All of your audio and video edits are collapsed into a compound clip, which is added to the current bin in the Media pool.



However, the compound clip is not a mixdown of your video and audio clips. It is a container of all your edits which you can still access at any time.

TIP Deleting a compound clip from a bin deletes it from any timeline into which it was edited, just as with a normal source clip.

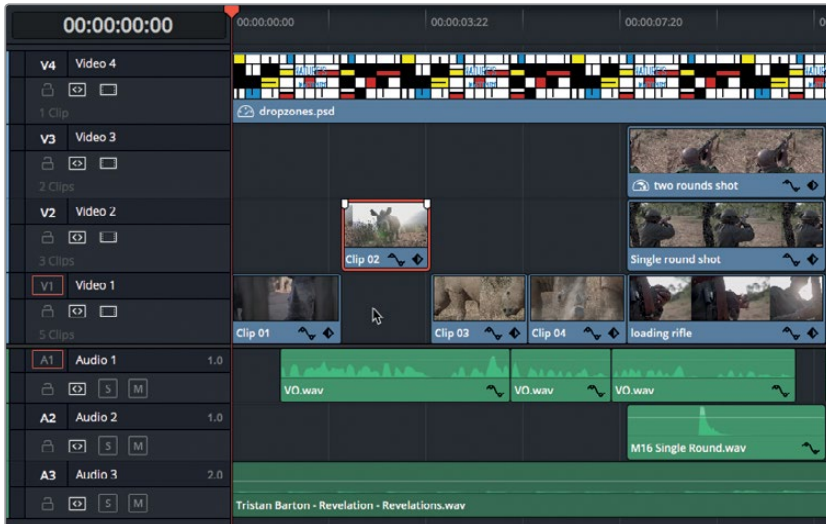
- 6 In the Timeline View Options, enable Stacked Timelines.
- 7 In the timeline, right-click the **Animation comp 01** clip, and choose Open in Timeline.

The compound clip opens into its own tabbed timeline and includes all your original edits. Every change you make inside this compound clip will update every instance of it in this project; this case in O2 cropped timeline and in the **Animation comp 01** clip in the bin. Let's make some changes to see this updating in action.

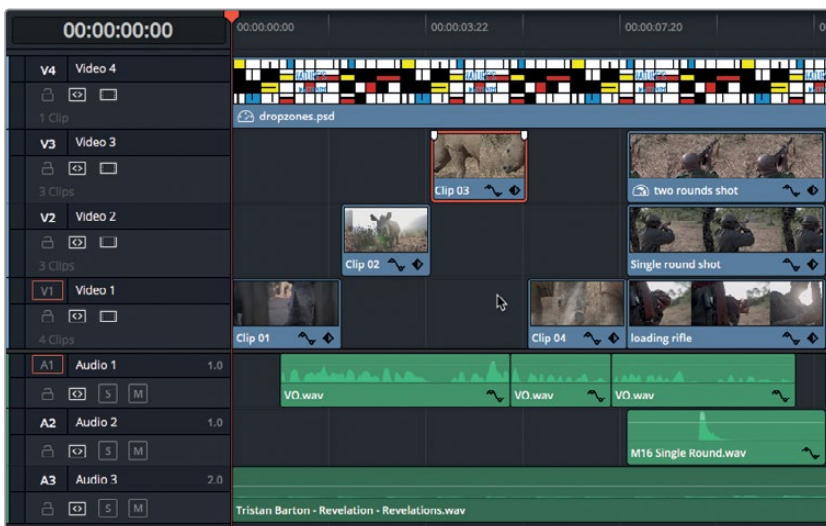
- 8 Go to the start of the timeline and play over the first four clips.

Notice that the first four clips are not on-screen at the same time. They pop on and off as one clip cuts to the next. Because you don't want gaping holes in your graphic, you'll need to ensure that the first four clips appear on-screen simultaneously. To do so, you must layer them on top of each other for the same duration.

- 9 In the timeline, select the second clip and press Opt-up arrow (macOS) or Alt-up arrow (Windows) once to move the clip up to the higher video track.

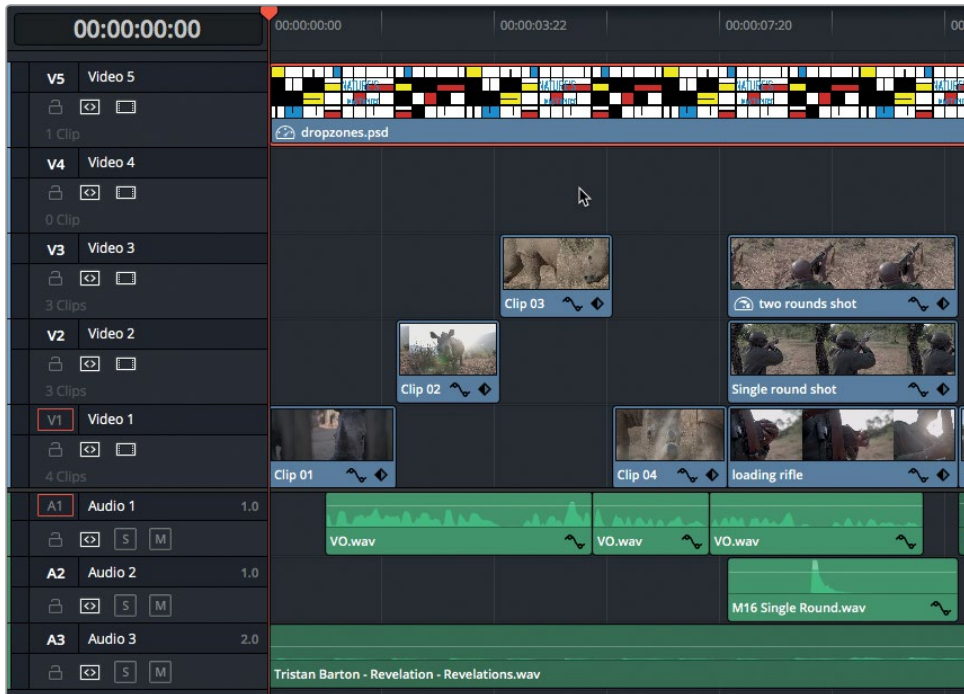


- 10 Select the third clip in the timeline, and press Opt-up arrow (macOS) or Alt-up arrow (Windows) twice to move the clip up two tracks.



Because the graphic is on the Video 4 track, you'll need to move it up to a new track before you can move the last clip. Even without an existing track, moving the graphic up automatically will create a new track.

- 11 In the timeline, select the graphic clip, and press Opt-up arrow (macOS) or Alt-up arrow (Windows) once to move the clip up to a new track.



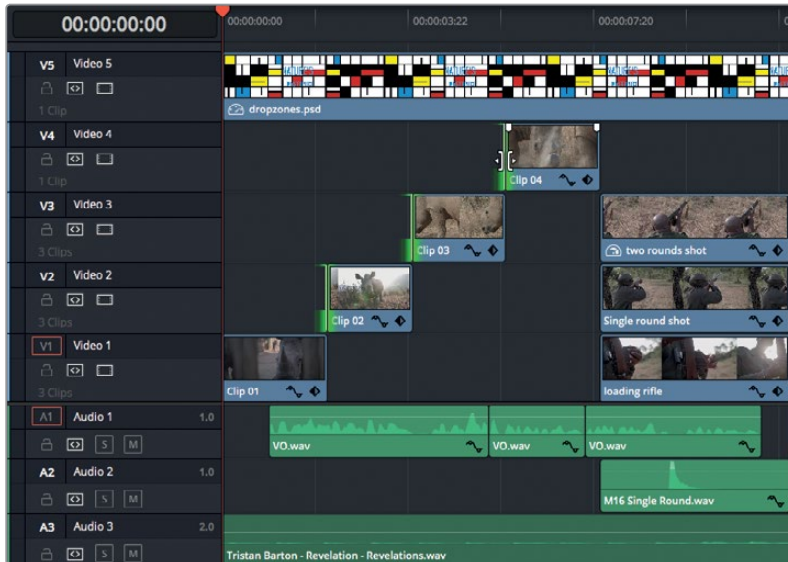
Now let's move the last clip.

- 12 Select the fourth clip in the timeline, and press Opt-up arrow (macOS) or Alt-up arrow (Windows) three times to move the clip up three tracks.

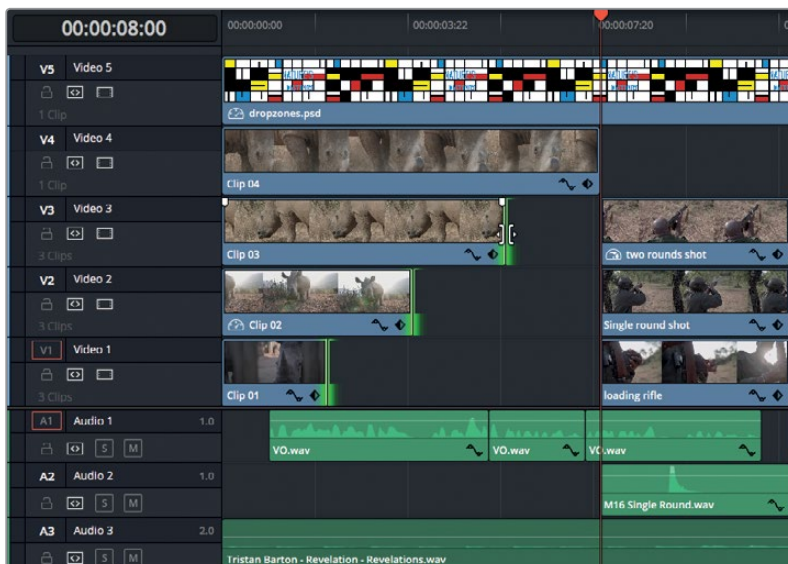
TIP When moving clips using the arrow keys, be careful to move only into empty areas of the timeline. Any clips you pass over, even temporarily, will be overwritten.

With all four clips on their own tracks, you can trim their heads so they all begin at the start of the timeline.

- 13 Cmd-click (macOS) or Ctrl-click (Windows) the heads of each of the three clips on V2, V3, and V4.

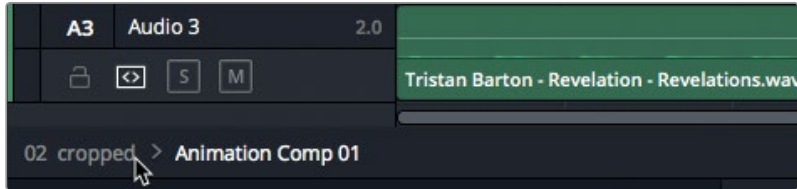


- 14 Move the playhead to the start of the timeline
- 15 Press E to perform an extend edit, thereby extending the start of each clip to the playhead.
- 16 Press Shift-Command-A (macOS) or Shift-Ctrl-A (Windows) to deselect the heads of each of the clips and then Command-click (macOS) or Ctrl-click (Windows) the tails of each of the clips on V1, V2 and V3.
- 17 Move the playhead to the start of **loading rifle**, **Single round shot** and **two rounds shot**.
- 18 Press E to perform an extend edit, this time lengthening the end of each clip to the playhead.



All four clips now fill the rectangles at the start of the timeline. You can return to the compound clip using the path control in the lower-left corner of the timeline.

- 19 In the lower-left corner of the timeline, in the path control, double-click the name of the main timeline, 02 cropped.



Because the timeline was updated with the changes, the **Animation comp 01** compound clip has also been updated.

- 20 Play through the first few seconds of the timeline to verify that the changes were made. The compound clip in the bin includes all the same updates you've made to compound clip in the timeline.

TIP When you need to decompose a compound clip back to its constituent parts, select the compound clip in the timeline, and choose **Clip > Decompose in Place**; or right click the compound clip in the timeline, and choose **Decompose in Place**. Doing so will return you to all the separate clips that were inside the compound clip. Note that this process does not remove the original compound clip from your bin.

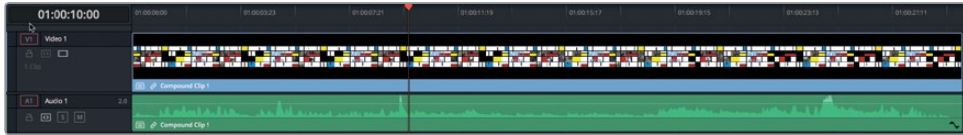
Animating a Compound Clip

Adding even subtle animation to your promos can make them more compelling. Animations can direct the viewers' eyes, set a mood, and provide more sophisticated transitions between individual elements or entire scenes. Animating in DaVinci Resolve is familiar to you if you have ever used keyframe animation in another application. You can perform animation in the Inspector, in the timeline, or directly in the viewer.

- 1 In the timelines bin, double-click the "03 layered" timeline to open it in the timeline viewer. This timeline has all of the clips layered, trimmed, cropped, and repositioned for you. It will enable you to jump right in and begin animating your compound clip.

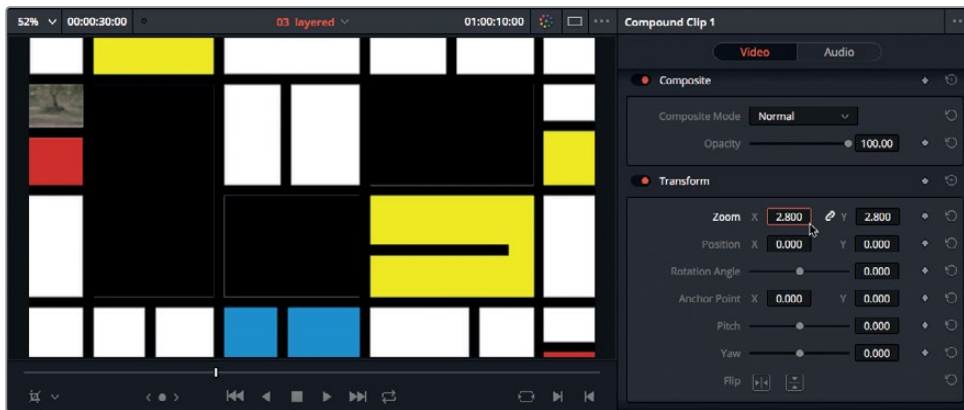
TIP To tidy up all the unused tracks, right-click any of the track headers, and choose Delete Empty Tracks.

- 2 With nothing selected in the timeline, type 10. (period), and press Enter.



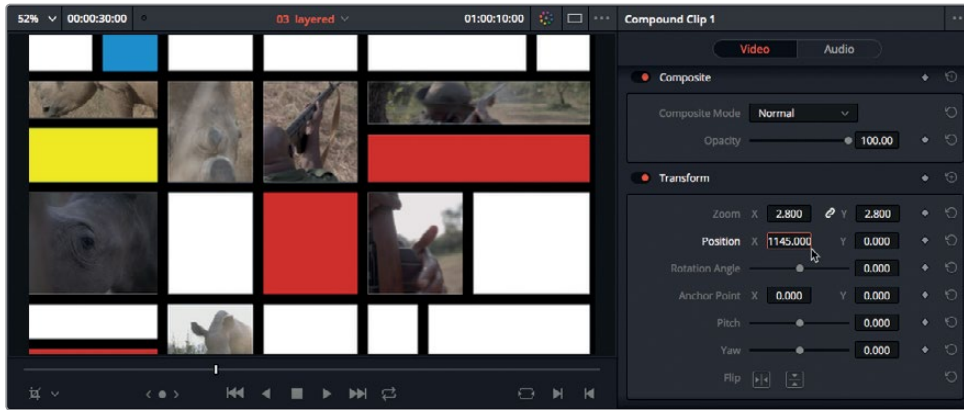
The playhead is placed at 10 seconds, just after the gunshots. This is where you will create the first keyframe to begin your animation.

- 3 In the timeline, select the compound clip. Open the Inspector, and in the Transform controls, set the Zoom data field to 2.800 to scale up the image the fill the frame.

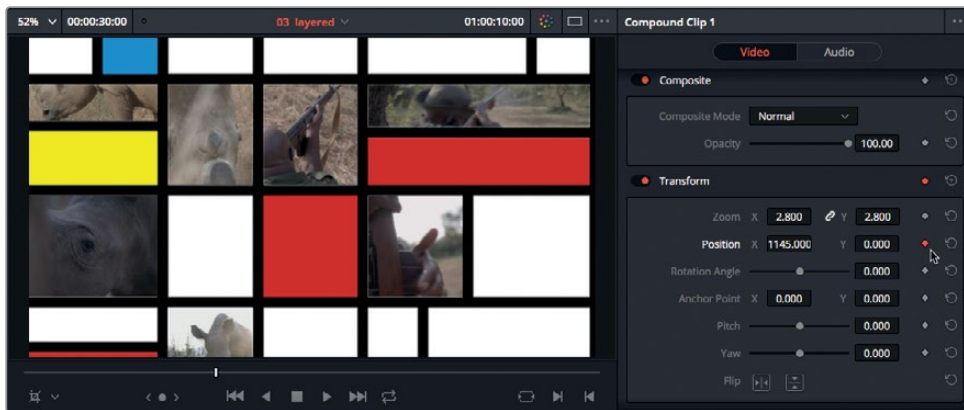


NOTE DaVinci Resolve is a resolution-independent application. When making complex scaling changes, as in this exercise (where you are scaling clips down, and up), the final resolution of each clip is calculated by taking into account the original resolution of the source media, the timeline resolution, image scaling settings, and any transforms applied in the Edit and Color pages, so that the final output always delivers the best possible resolution for each clip, regardless of the number of transforms applied to it.

- 4 Drag right in the Position X data field until the edge of the image reaches the left edge of the raster, or type **1145**, and press Enter.

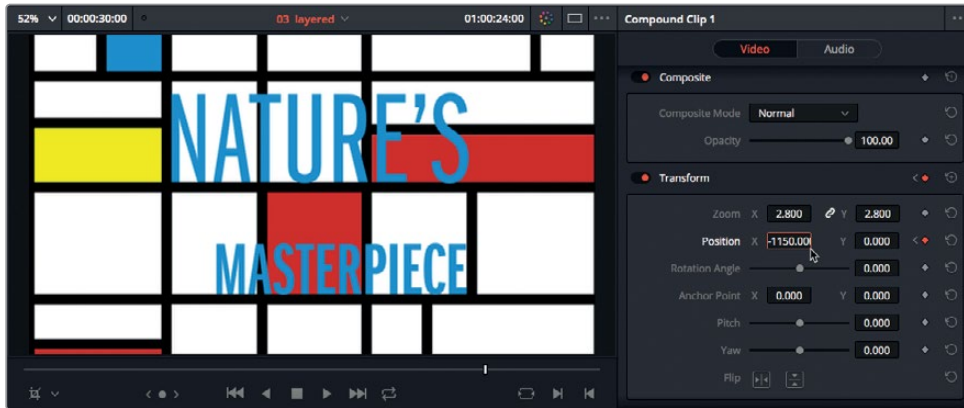


- 5 In the Inspector, to the right of the Position parameters, click the keyframe button.



A keyframe is added to the X and Y Position parameters in the transform category. To finish your animation, you now need only to go to the end of the timeline and set your final framing.

- 6 With nothing selected in the timeline, type **24.** (period), and press Enter. The playhead is placed just after your on-screen interview shot concludes. This is where you will place the ending keyframe.
- 7 In the timeline, select the compound clip.
- 8 Drag left in the Position X data field until the graphic reaches the right edge of the screen, or type **-1150**, and press Enter.



- 9 Play the Timeline to see the results.

For the first time, you can start to see what your output eventually will look like and even which grid boxes will be visible. However, unless you are using a very powerful workstation, the playback won't be anywhere near smooth enough to properly evaluate the actual speed and motion of your animation. To improve playback, let's look at some of the performance optimization available in DaVinci Resolve.

Improving Multi-layered Performance

When working with many layers, it's important that you optimize your timeline for playback, especially if your computer doesn't have plenty of RAM or a powerful graphics processing unit (GPU). Resolve offers several ways to monitor and improve playback performance.

- 1 Move the playhead to the start of the timeline and click play.

Look at the frame rate display in the upper-left of the timeline viewer that shows the playback frame rate Resolve is achieving. The small green or red light to the left of the frame rate display is the graphics processing unit's performance. Because all image processing goes through the GPU (graphics processing unit), if the light is green, it indicates that the GPU has enough processing power to render the current frame in real-time. A red light indicates that the GPU lacks the processing power for a real-time rendering. The fastest way to improve GPU performance is to lower the resolution of your clips on-the-fly.

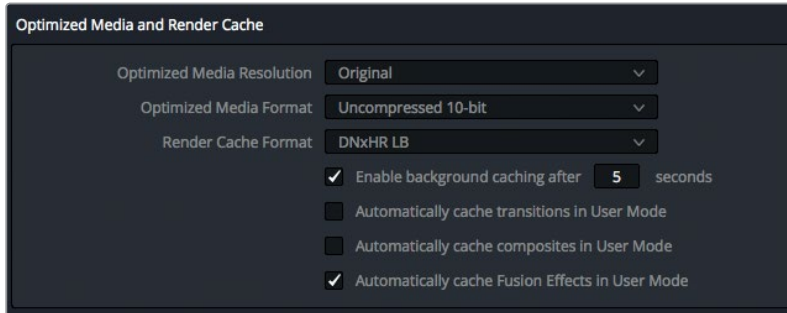
- 2 Choose Playback > Proxy Mode > Half Resolution.
- 3 Move the playhead to the start of the timeline and click play.

Enabling proxy mode increases performance by lowering the image quality as the image is read from disk. If lowering the image quality is not an option, and you have the flexibility to wait a few seconds, you can instruct Resolve to render images to a disk cache for smoother playback.

- 4 Choose Playback > Proxy Mode > Off.

Enabling the smart render cache automatically renders areas of the timeline that would not otherwise play back smoothly. The Project settings dictate the compression format used for the cache and sets the wait time to determine when rendering should be activated.

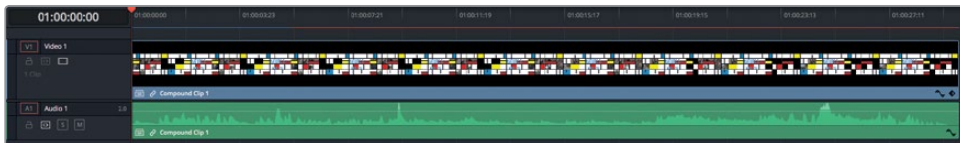
- 5 Choose File > Project settings to open the Project settings window, or press Shift-9.
- 6 In the Master settings, in the Optimized Media and Render Cache area, set the Render cache format to DNxHR LB.



This is a low-bandwidth compression format that produces a data rate of around 4.5MB/second (around 36Mbps) for HD 25fps media. It will result in a better viewing quality than proxy mode and still enable smoother playback on almost any system.

TIP Changing the Render cache format will re-render all previously cached frames for your entire project.

- 7 Click Save to close the settings window.
- 8 Choose Playback > Render Cache > Smart.



A red line appears along the top of the timeline to identify the area to be cached. After you leave your system idle for a fixed wait period (the default is 5 seconds), Resolve starts to cache the frames and the red lines turn blue to indicate a successfully cached area.

- 9 Allow the compound clip to cache in the timeline, and then play back the timeline to review your animation.

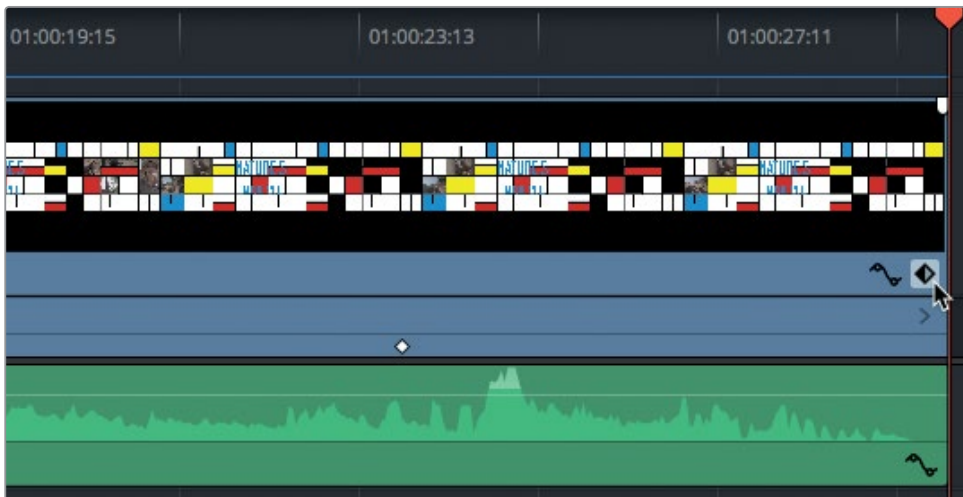
TIP Another way you can begin to assess how an animation is working is to open the compound clip in the timeline and disable groups of clips or tracks. In doing so, less media being is played, and you will be reducing Resolve's workload. Once you have finalized the keyframes timing, you can begin to re-enable the clips or tracks within the compound clip and let Resolve cache the resulting animation.

In Lesson 1 you generated lower-resolution proxy files as part of the edit prep process. Such files, when combined with smart caching, can vastly improve performance when working with high-resolution clips, complex multi-layered timelines or interframe-compressed video formats, such as H.264.

Adjusting Keyframes

Now that you have playback performance at a point where you can evaluate the effectiveness of your animation, let's review and adjust the timing and acceleration of that animation. At present, the animation begins a little too early. The on-screen interview appears as black frames as the animation starts. If you move the keyframe later, your interview clip should be on-screen just before the animation gets to her.

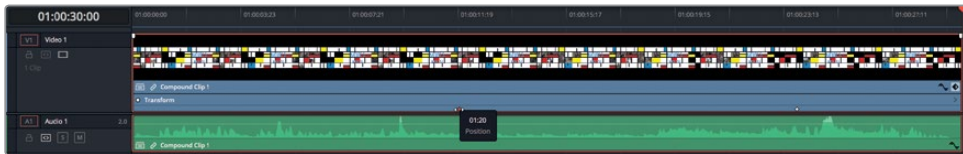
- 1 In the lower-right corner of the compound clip, click the diamond-shaped keyframe button.



The Keyframes editor appears directly under the compound clip in the timeline. The two white diamond icons represent the current positions of the keyframes you've added.

TIP You can reveal the Keyframes editor by selecting the clip on the timeline and choosing Clip > Show Keyframe Editor or pressing Shift-Command-C (macOS) or Shift-Ctrl-C (Windows).

- 2 To change the start of the animation, select the first keyframe in the Keyframes editor. When a keyframe is selected, it turns red to show that you can drag it earlier or later in the timeline.
- 3 Drag the keyframe to the right until the tooltip displays 2:00. This should place it right as the on-screen interview can be heard.

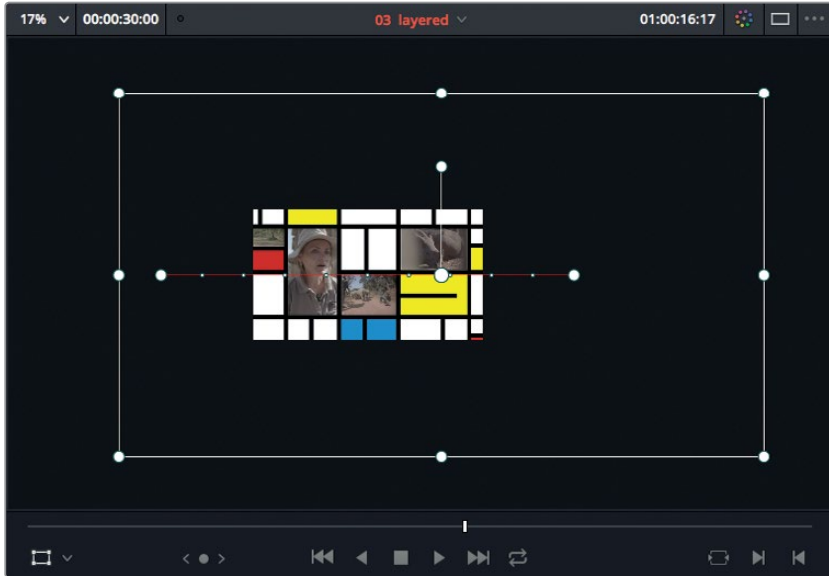


- 4 Repeat this process with the second keyframe, moving it to the right until the tool tip reads 3:00.

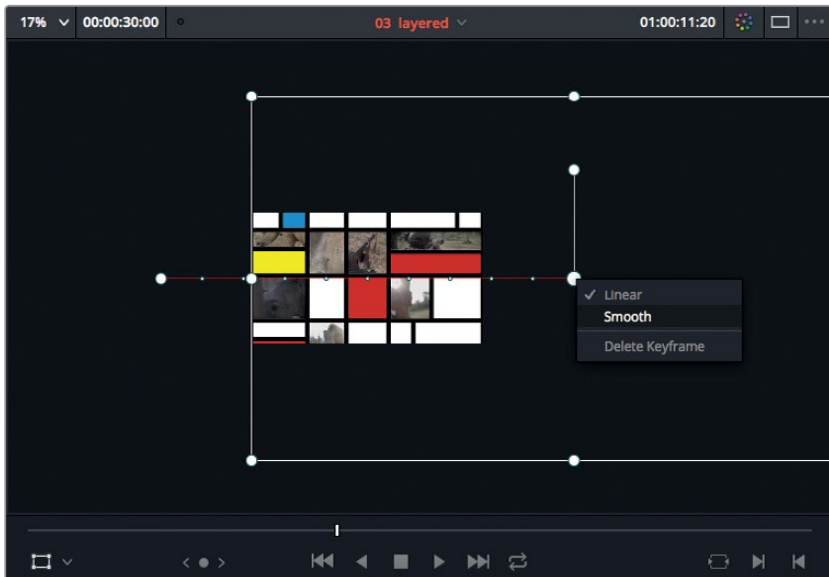
TIP You can Command-click (macOS) or Control-click (Windows) multiple keyframes to select them, and move them together.

Now, you'll add an ease-in/ease-out acceleration to the ending keyframe to create a smoother landing for the animation.

- 5 In the timeline viewer, click the onscreen control menu, and choose Transform.

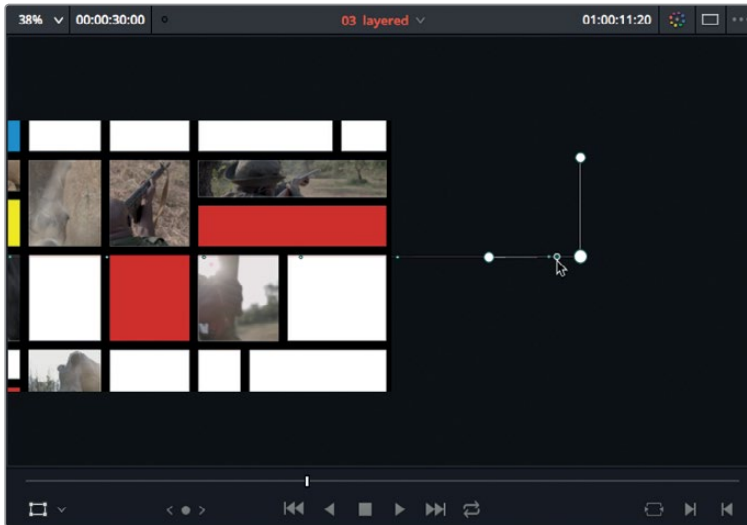


- 6 In the timeline viewer, zoom out of the image.
You can now see the motion path created by the keyframes you've added to the compound clip, along with the usual on-screen controls for the clip's anchor point, rotation and zoom.
- 7 Click the motion path's keyframe on the right to select it. (This is your first keyframe on **Animation comp 01**, the animation's starting point, where the compound clip had been moved left across the screen). Right-click the control point, and choose Smooth.



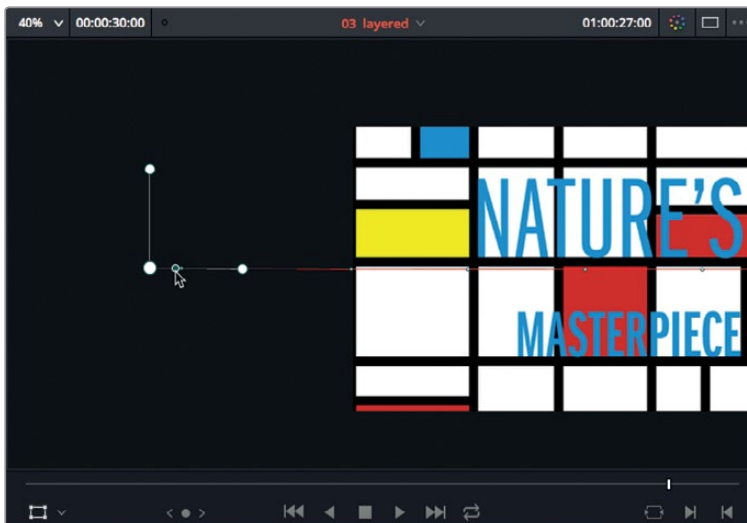
A Bézier spline handle is added to the path, allowing you to modify the curvature of the path and also to increase or decrease the ease-in, or smoothness, of the motion path. The outer handle allows you to modify the shape or curvature of the path. The inner handle controls the acceleration of the animation.

- 8 Drag the outer control slightly to the right, bringing it closer to the keyframe and then adjust the inner handle further to the right.



See how the dots along the motion path adjust to these changes? This behavior will help smooth the beginning of the animation so it doesn't begin moving abruptly.

- 9 Repeat these steps to smooth the animation of the second keyframe (to the left of the screen).



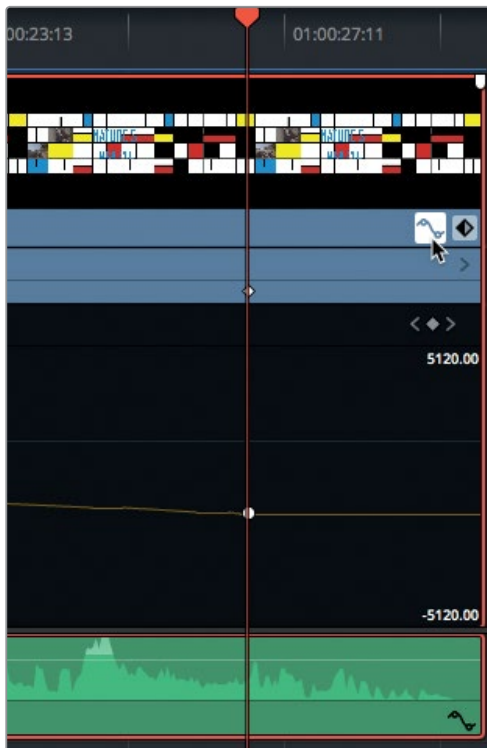
- 10 Return the timeline zoom pop-up to Fit, and turn off the transform on-screen controls. Allow time for the new animation to cache, and then play it to see the smoother start and end to the animation.

Now the motion path has a nice, smooth landing as the animation ends.

TIP If you need to clear the current render cache so you can see your changes, select the compound clip in the timeline, and choose Playback > Delete Render Cache > Selected Clips.

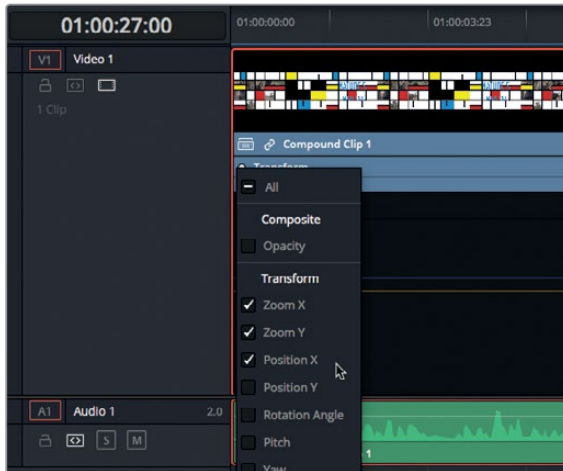
You can also see the curve editor for this animation in the timeline.

- 11 In the lower-right corner of the compound clip in the timeline, click the curve editor.



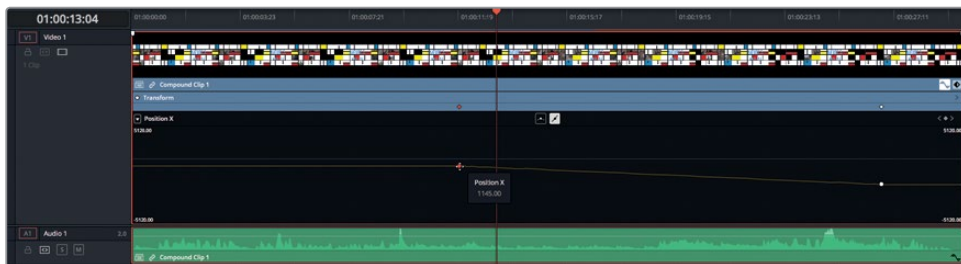
This displays the curve controls below the Keyframes editor underneath the clip in the timeline.

- 12 In the upper-left corner of the curve editor, click the pop-up menu, and choose the Position X control.



TIP The checks next to parameters indicate that keyframes have been added to those parameters.

- 13** Select the first keyframe for Position X to see the Bézier handle.



In the curve editor, you can further refine your animation's motion path, and edit X and Y position keyframes independently.

- 14** Once again, allow time for the new animation to cache, and then play it to see any changes you've made to the animation. Refine further to suit yourself.

Animation is so full of creative possibilities that it can be tempting to add elements just for the sake of watching them on the screen. However, animation and graphics added “just for fun” typically detract from the overall impact of a message. Unnecessary elements can often increase confusion when they should instead bring clarity to your message.

As a result, when you create a motion graphics animation for promos, think through every visual element and the way it will move. Make sure that each creative and technique choice the overall communication of the project, as well as the individual scene to which it belongs. By doing so, you should be able to create a more appealing design and maximize its impact.

Lesson Review

- 1 What will happen to a four-second source clip that is edited into a two-second marked section of the timeline using a Fit to Fill edit?
 - A) Only the first two seconds will be used in the timeline.
 - B) The clip will be retimed to 50 percent of its original speed.
 - C) The clip will be retimed to 200 percent of its original speed.
- 2 True or False? The Replace edit will respect in and out points set in the source viewer.
- 3 How do you create a compound clip?
 - A) Set in and out points around the clips in the timeline, and choose Clip > New Compound Clip.
 - B) Select the clips in the timeline, and choose Clip > New Compound Clip.
 - C) Click the New Compound Clip button in the Media pool
- 4 How can you edit the contents of a compound clip?
 - A) Right-click the compound clip, and choose Decompose in Place.
 - B) Right-click the compound clip, and choose Open in Timeline.
 - C) Right-click the compound clip, and choose Open in Tab.
- 5 Where do you adjust the timing of keyframes that have been added to timeline clips?
 - A) In the Keyframe controls in the Inspector
 - B) In the Keyframes editor of the Timeline
 - C) In the clip's Keyframes editor

Answers

- 1 C. The source clip will overwrite the contents on the destination track and be retimed to 200 percent of its original speed.
- 2 False. The duration in the timeline being replaced can be set with in and out points, but the replace edit will ignore any in or out points set in the source viewer as it aligns the frame at the position of the source playhead with the timeline playhead.
- 3 B. Select the elements in the timeline that you want to place within the compound clip. Choose Clip > New Compound Clip; or right-click the selected clips, and choose New Compound Clip.
- 4 B. Right-click a compound clip in the Media pool or the timeline, and choose Open in Timeline. Alternatively, choose Clip > Open in Timeline.
- 5 C. Click the keyframe button in the lower-right corner of the clip. Alternatively, you can select the clip, and choose Clip > Show Keyframe Editor; or press Cmd-Shift-C (macOS) or Ctrl-Shift-C (Windows).

Lesson 8

Creating Graphics in Fusion

Fusion is an advanced compositing application built directly into the DaVinci Resolve 15 interface. It employs a node-based approach to compiling visual effects and motion graphics, which is the preferential method in film and television industries due to its superior quality, flexibility and efficiency. Editors can use Fusion to create custom titles and credit sequences, insert missing elements into a scene and cover-up continuity issues.

As Fusion is located directly in DaVinci Resolve, switching between editing, grading, audio mixing and compositing is a seamless process. It is no longer necessary to transcode or pre-render media. Instead, you click on the page you need to immediately switch to the necessary toolset. The exercises in this chapter are designed to familiarize you with the Fusion Page interface and some of its fundamental operations, like merging nodes, creating rolling credits, tracking clips, and keying green/blue screen.

Time

This lesson takes approximately
90 minutes to complete.

Goals

Navigating the Fusion Page Interface	242
Understanding the Node Editor	244
Using Text and Merge Nodes	249
Creating Rolling Credits	259
Tracking a Scene	265
Keying and Compositing	270
Lesson Review	279

Navigating the Fusion Page Interface

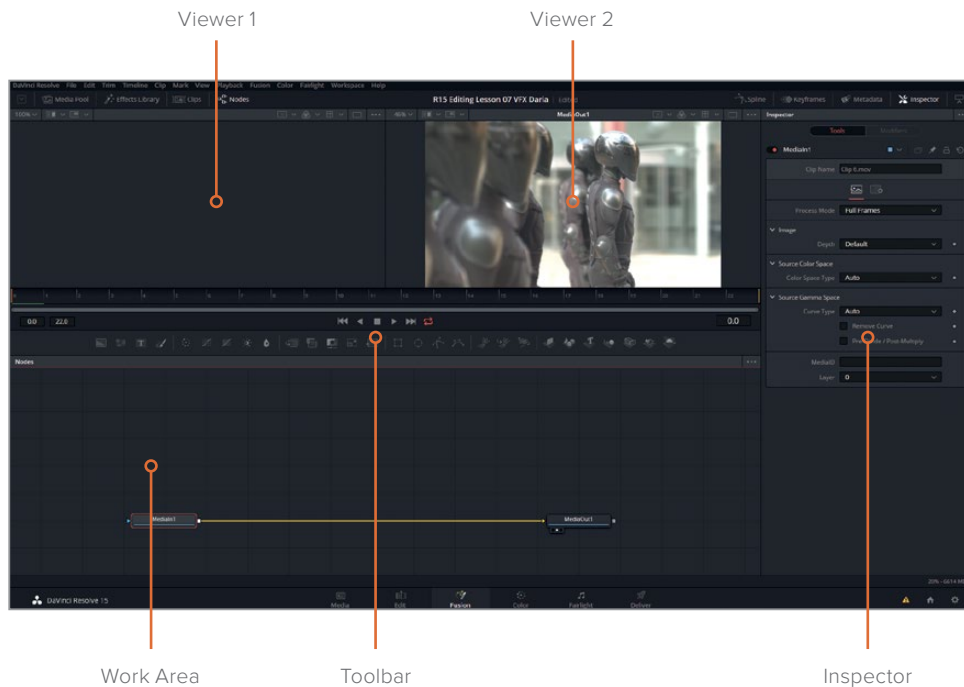
To begin creating custom graphics and composites in Resolve, all you need to do is click on the Fusion page icon at the bottom of the software. This quick exercise will take you through the Fusion interface and identify the layout and functionality of its panels.

The project used for the exercises in this chapter will be based on a series of shots from the short sci-fi film 'Sync'.

- 1 In the project manager, right-click, and choose Import. Navigate to R15 Editing 201 > Lessons > Lesson 07 VFX.
- 2 Select **R15 Editing Lesson 08 VFX.drp**, choose Open, and click OK to import the project into your project manager.
- 3 Open the project and relink media files.
- 4 On the Edit Page, ensure 01 Fusion timeline is open, and the playhead is on the first clip.

To work on a specific clip in Fusion, the playhead needs to be placed over it on the Edit page timeline. If there are multiple video tracks, the top-most clip will be sent to Fusion for compositing.

- 5 Click the Fusion page icon at the bottom of the software interface, or press Shift-5 to launch Fusion.



Fusion is divided into four main sections. The two viewers at the top can be used to show the output of any node in the pipeline. Directly under the viewers is a time ruler with playhead controls. In the middle of the page is the toolbar, where you can access the most commonly used tools and effects. The large work area at the bottom is used to construct and animate composites via the Node, Keyframe and Spline editors. The Inspector on the right side of the page contains the adjustable parameters for any selected node.

- 6 The main work area currently displays the Node editor. The Keyframe and Spline editors can be activated in the work area by clicking their respective buttons in the Interface Toolbar at the top of the page.

To move around the work area, hold the middle mouse button and drag inside the panel.

TIP To zoom in and out of the work area editors, press the Cmd key (macOS) or the Ctrl key (Windows) and scroll the middle mouse wheel.

- 7 Underneath the Viewers, drag the red playhead line to scrub through the clip.



Note the green lines that appear under the frames of the time ruler. These represent the portions of the video that are cached. To see a composite in real time, you must first play the video through until all frames are cached. Once the time ruler is solid green, it will playback in real time.

TIP You can allocate more RAM to the Fusion page using the Fusion memory cache setting located in Preferences >System>Configuration.

The yellow lines on either side of the time ruler define the render range. This is the duration that will be used for playback, caching, previews and final rendering. In longer takes, you might want to drag the yellow bars to shorten the render range and focus only on the composited areas for faster preview.

TIP Use square brackets [and] to navigate up and down the timeline by 1 frame. Move the playhead to the start and end of the render range by pressing Option-[or] (macOS) or Alt-[or] (Windows).

Now that you are familiar the time ruler and can navigate in the node editor, you can begin adding nodes to the pipeline.

Understanding the Node Editor

As with all node-based compositing interfaces (including the node editor in the Color Page of DaVinci Resolve), the order and placement of the nodes in the pipeline has great significance. The RGB signal flows through the various media and image processing operations in the node editor before it reaches a final output node.

This method of compositing requires some practice to fully grasp, but is ultimately more processor efficient and versatile than layer-based systems.

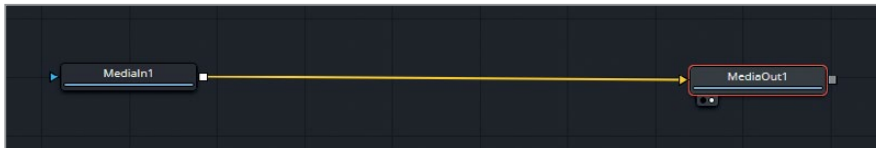
The next set of exercises will familiarize you with the signal pipeline and the impact that node order has on it.

Assigning Media Nodes to the Viewer

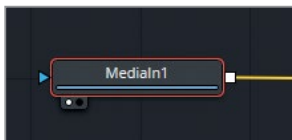
You can change the behavior of the viewers in the Fusion page based on the stage of your workflow that you want to focus on. In this exercise, you will assign viewers to different nodes for preview.

- 1 Any clip or image file that you bring into the Fusion page is represented by a MediaIn node. In the current node editor, the MediaIn1 node is connected to the source video file of clip 1 in the timeline.

The MediaOut node is the final output of the signal flow and represents how the image will look upon delivery.



Select MediaIn1 and press 1 on your keyboard to send the signal of the source video to viewer 1.



The two dots under the nodes represent which node is being shown in which viewer. To change what the viewers display, click any node in a pipeline and press 1 or 2 on your keyboard, or click directly on the dots underneath the nodes.

TIP When using a 3rd display, like a full screen broadcast monitor connected via a Blackmagic Design UltraStudio or DeckLink card, you will see three dots under the nodes. Pressing 3 will display the node in full screen in the grading monitor.

- 2 To maintain order and ease navigation within the node editor, you can rename your nodes. Right-click MediaIn1 and choose Rename or press F2 to reveal the rename tool.
- 3 Enter the name SYNC_SHOT.

TIP Spaces are not displayed in the node labels of the Fusion page. Create separation between words with capital letters or an underscore.

- 4 Rename MediaOut1 as OUTPUT.

With the media assigned and labelled, you can start to add additional nodes between them.

Adding a New Node

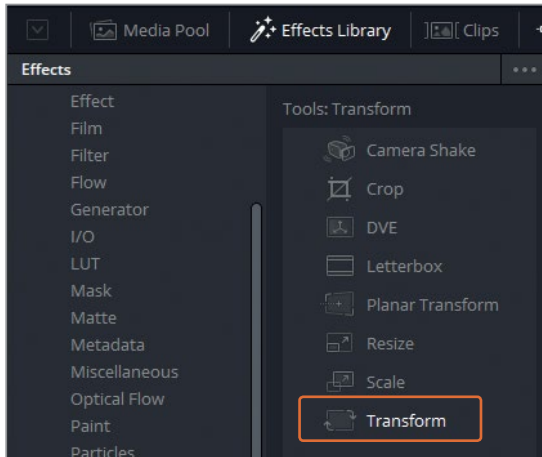
Nodes are essential to manipulating the image in the Fusion page. There are a wide variety of node types – some alter the pixel data of the image, some control its movement and behavior, and others generate RGB data that is added to the existing image.

NOTE In Fusion, nodes that affect the behavior of a signal are also referred to as tools. In these exercises, both terms will be used based on function.

There are several ways in which tools and nodes can be accessed and added to a composite. One way is to use the Effects Library panel, in which the tools are clearly labelled and categorized.

In this exercise you will resize and reframe the first shot in the timeline to change its narrative.

- 1 Open the Effects Library panel.
- 2 Expand the Tools folder and enter the Transform category.



- 3 Drag the Transform tool onto the connection between SYNC_SHOT and OUTPUT in the node editor.



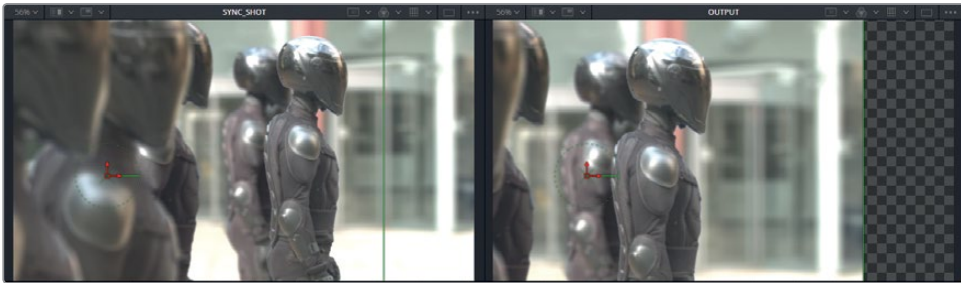
- 4 Click the Effects Library button again to hide the panel and make more room for the viewers.

At the moment, the scene in the viewer is building tension by showing the growing line of these 'sync' surveillance machines. They take up the majority of the frame, and are presented as an imposing group.

In this quick exercise, you will change the narrative of the scene by resizing and reframing the shot. The aim will be to get the audience to connect with the character in the middle.

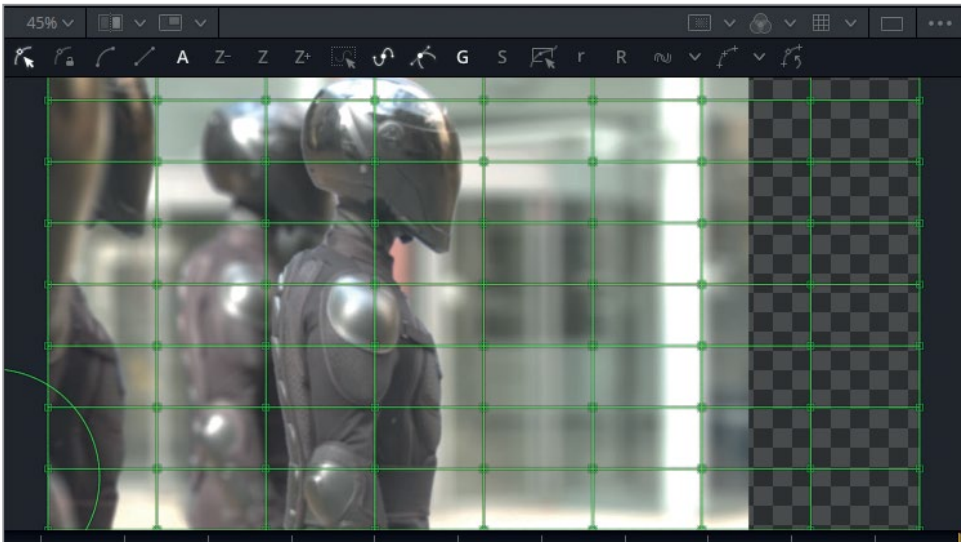
- 5 Select the Transform node.
- 6 In the Inspector, increase the Size to about 1.2.
- 7 Use the on-screen controls in viewer 2 to push the video to the left. Your goal is to move the central character to the left third of the screen, giving them a stronger screen presence.

Note that only viewer 2 shows you the result of this change. This is because viewer 1 is currently set to show you the state of the SYNC_SHOT source, which is not being affected by the transform node.



This has left the final image with a significant gap on the right side of the screen. You can fill this gap by stretching the RGB data on the right side of the shot. This is only advisable in shots where there are no moving elements, and the data is either out of focus, or a solid/gradient color.

- 8 Open the Effects Library.
- 9 Expand Tools > Warp and click on Grid Warp.

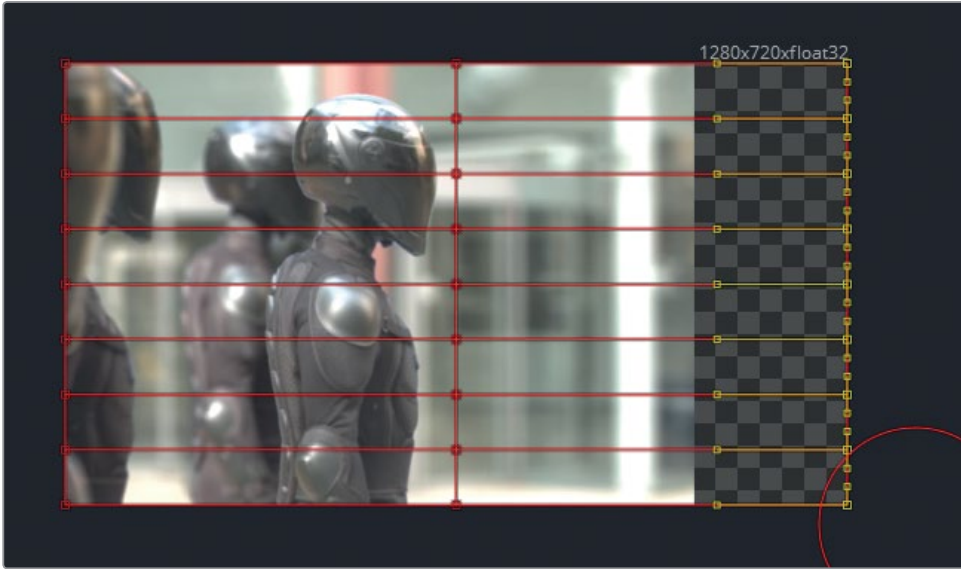


This will add the Grid Warp tool directly after the Transform node.

- 10 You can use the Grid Warp to stretch pixel data in the viewer. At the moment, there are too many divisions to be able to stretch the data to a satisfactory degree.

In the Inspector, change the X Grid Size to 2. This will decrease the divisions down to 2 columns, which will allow you to use the entirety of the data on the right-hand side of the shot.

- 11 Press the Cmd key (macOS) or the Ctrl key (Windows) and scroll the middle mouse wheel to zoom out of viewer 2.
- 12 Press the Cmd key (macOS) or the Ctrl key (Windows) and drag across the side of the grid to select all the points in the right-most column.



- 13** Hold Shift-Alt on your keyboard and press the right arrow key to move the edge of the column off the screen.

This will stretch the pixel data on the right side of the image. Continue to stretch the grid until the gap on the right is completely filled up.

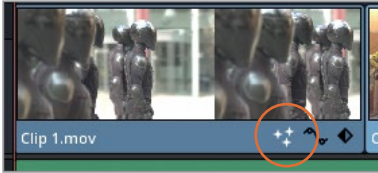


The scene now has a different feel to it – as the audience, we are now connecting much more strongly with the central character.

This reframed shot is now ready to be viewed back in the timeline of the Edit Page.

- 14** Click the Edit page icon at the bottom of the software interface, or press Shift-4. Note that the changes you have made have been immediately applied to the clip. No rendering or exporting was required.

A symbol in the bottom-right corner of the clip indicates that it has been composited in the Fusion page.



- 15 Return to the Fusion page.

Warp tools can be used to create dramatic results, but they are also capable of more subtle application, like when realistically extending the edge of a frame.

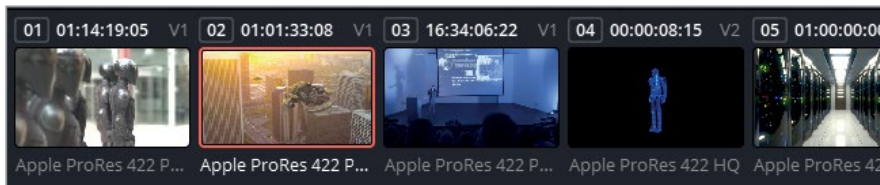
Using Text and Merge Nodes

Nodes that act as tools can be connected directly to the node pipeline. When you want to introduce additional media layers to a composite, or add nodes that are generators of RGB data (such as text nodes or solid backgrounds), you will need to make use of merge nodes.

Switching Between Clips

For the next exercise, you will first need to switch to a new clip on the timeline. We saw at the start of the chapter that you can accomplish this by placing your playhead over the relevant clip in the timeline on the Edit Page. But there is also a way to switch between clips inside the Fusion Page.

- 1 Click the Clips button at the top of the page to open the thumbnail timeline.
- 2 Select clip 2.



The Fusion page will load the new clip, and show you a blank composition pipeline consisting of just the MediaIn and MediaOut nodes.

Notice that you can right-click on any thumbnail in the timeline to reveal new composition controls. Use these controls when you want to attempt a new version of a composite, but do not want to lose your previous work.

- 3 Click the Clips button again to hide the timeline and make more room for the Node Editor and Viewers.

With the relevant clip selected, you can now begin to composite the opening title graphics over it.

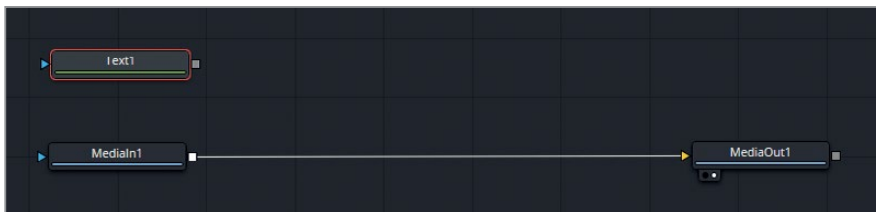
Adding Text to a Composition

When adding additional media to a pipeline, you need to specify how it will relate to the existing composite in terms of its layer structure. Merge nodes allow you to combine the RGB data of multiple media streams, with dedicated inputs for foreground and background elements.

In this exercise, you will design the opening text graphic for the film ‘Sync’.

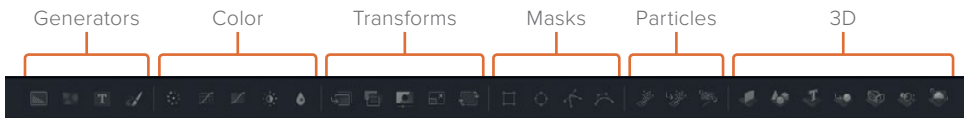
- 1 Open the Effects Library and locate Tools > Generator.
- 2 Drag the Text+ tool into an empty part of the node editor, above MediaIn1.

The Text+ node appears in the graph, but does not yet have a relationship with the connection line between the MediaIn and MediaOut nodes, and so will not have an impact on the image in Viewer 2.



To layer the Background over the video, you will need to use a Merge node.

Although the Effects Library includes the full range of tools, you can access the most common tools in the toolbar above the Node editor. The toolbar is divided into six categories. From left to right the categories are: Generators, Color, Transforms, Masks, Particles and 3D.



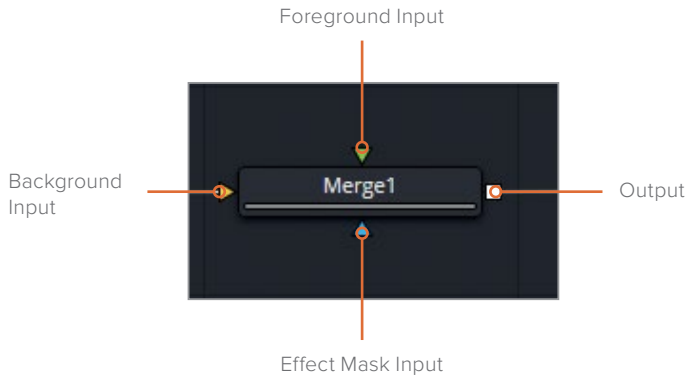
Clicking on any tool in the toolbar inserts it directly after the selected node. This makes it very easy to add nodes precisely where you need them without having to manually connect them.

TIP Hover your mouse over the icons in the toolbar to see the names of the tools.

- 3 With the MediaIn1 node selected in the node editor, click the merge tool in the toolbar.



The merge node appears in the editor. It has three color-coded inputs: background (yellow triangle), foreground (green triangle), effect mask (blue triangle) and one output (white square).



- 4 Click the output of the Text1 node and drag it to the Merge node to connect them.



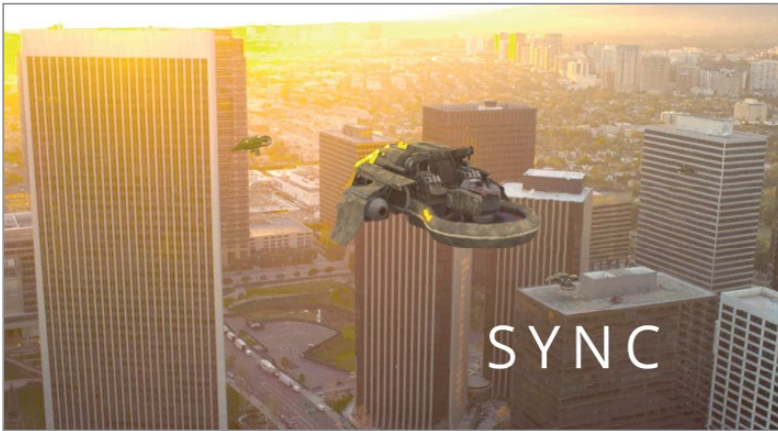
With the Text node selected, you can now enter and customize the text that appears over the video clip.

NOTE The merge node is one of the most essential and frequently used tools in the Fusion page. In each merge node, the yellow connector always represents one background layer and the green connector is always a foreground. Every time you want to add additional layers to a composite, you need to create a new merge node and link the respective foreground and background layers along the node pipeline.

- 5 In the Inspector, enter the film title *SYNC* into the Styled Text field.
- 6 Use the drop-down menu to set the font to Open Sans and give it a Regular weight.
- 7 Increase the size of the text slightly (0.125) to make it easier to read on the screen.

TIP The small gray dot under any parameter shows the default position of that slider. Clicking the gray dot resets the slider to the default position.

- 8 Increase the tracking (1.100) to space the letters further apart.
- 9 Use the on-screen controls to move the position of the text into the lower-right. Placing it over the building in the foreground will give it a good amount of contrast and make the text 'pop'.



At the moment, the text is plain white. You can use the swatch under the Font field to change the text to a different solid color. For more advanced controls of the text appearance, including adding outlines and shadows, you will need to use the Shading tab in the Inspector.

Using Shading Elements to Customize Text

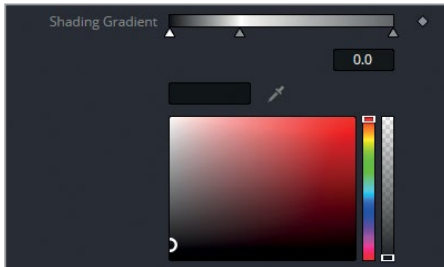
Visual configurations of text nodes are known as shading elements. By default, when you create a new text node, there is only one shading element which defines the fill type and color of the text.

- 1 Click the Shading tab button at the top of the Inspector.



- 2 Under the Properties heading, change the fill Type to Gradient.
You can now use the Shading Gradient bar to specify which colors will appear in the gradient fill of the text. The default setting is a black-to-white gradient.
- 3 Click the triangle on the left side of the gradient bar, and then use the color picker underneath to set its color to dark grey.

- 4 Click the triangle on the right side of the gradient bar, and set its color to light grey.
- 5 Click on the gradient bar itself to add a new swatch triangle on the left half of the gradient.
- 6 Use the color picker to set the middle gradient color to white.



The resulting gradient should look like brushed metal.

To make the text stand out against the background a bit more, you can also add a soft shadow. To accomplish this, you will need to create a new shading element and designate it as a shadow.

- 7 Click the Select Element drop-down menu at the top and choose 2.
- 8 Click Enabled to open the shading element controls.

Shading elements can be modified in a multitude of ways – you can use the Appearance controls in the Properties segment to specify a starting point like Text Fill, Text Outline, Border Fill, or Border Outline.

However, the numbered elements also have some default behaviors. As you can see, element 2 begins as a red outline. To save time, you can activate shading element 3, which always starts off as a drop shadow.

- 9 Unselect Enabled to disable shading element 2.
- 10 Select Element 3 and click Enabled. This reveals the default text shadow.
- 11 Lower the Opacity to 0.5 to make the shadow softer against the background.
- 12 To better blend the text into the scene behind it, you can activate a composite mode in the merge node.

NOTE Composite or blend modes refer to processes in which two layers are combined using an algorithm that adds, subtracts, multiplies or divides their respective luminance or chrominance pixel values. Blend modes are often used in graphic design, or for light/shadow-based visual effects.

Select the Merge node.

- 13 Change Apply Mode to Hard Light.

This will blend the darker elements of the foreground (the edges of the gradient), while retaining the brightness of the lighter elements.



With the text in place, you can now start animating its parameters to make its appearance on screen more dramatic.

Keyframing Parameters

You can change the value of a parameter over time by using the keyframe controls in the inspector. In this exercise, you will change the opacity and scale of the text as it appears, and then refine the gradient to give it a dynamic shine. You will then use the keyframe editor to refine your animations.

- 1 When animating motion graphics, it's often a good idea to start at the end, where your graphics are set to their final position.

On the time ruler, move the playhead to frame 75.

- 2 One of the most common animations for text is to change the opacity, creating a fade-in effect.

With the merge node still selected, click the keyframe icon next to the Blend parameter.



This will lock the value of the blend parameter to that moment in time.

- 3 Drag the playhead to the beginning of the clip (frame 58).

- 4 Change the Blend parameter to 0.0.

The text will disappear from the screen.

- 5 Drag the playhead across the time ruler to see the text slowly fading in.

You can also animate physical properties of the text – like size or rotation. Any parameter with the keyframe icon next to it is capable of being animated.

- 6 Select the Text node.

- 7 In the Inspector, enter the Transform tab.

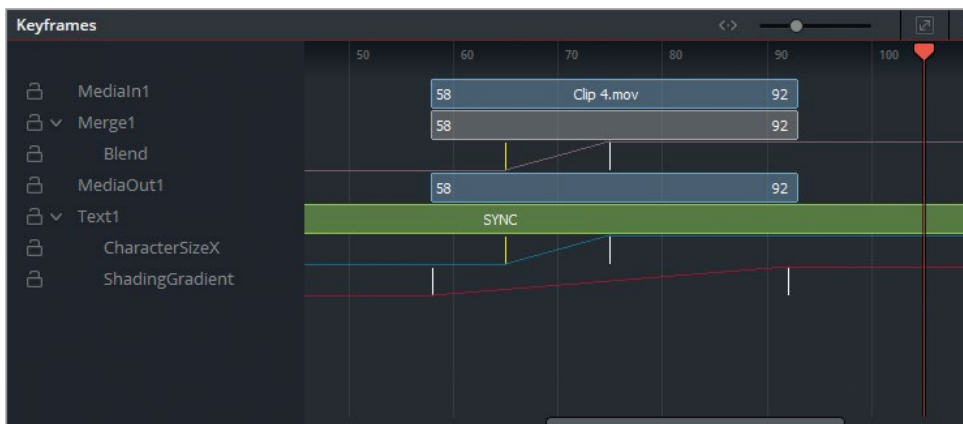
At the bottom, the individual X and Y size parameters allow you to stretch or compress the text on a vertical or horizontal scale. You are going to animate the X Size parameter to have the individual characters expand into their final positions.

- 8 Move the playhead to frame 75.

- 9 Press the keyframe next to the X size parameter.
- 10 Drag the playhead to the beginning of the clip.
- 11 Change the X Size value to 0.0.
- 12 Drag the playhead across the time ruler to check the animation. The characters now fade in, as well as scaling horizontally.
Finally, you can also animate color values. You will adjust the behavior of the gradient to give the illusion of a white highlight travelling down the letters.
- 13 Enter the Shading tab.
- 14 Move the playhead to the end of the clip (frame 92).
- 15 Press the keyframe next to the Shading Gradient bar.
- 16 Drag the playhead to the beginning of the clip.
- 17 Drag the center of the gradient (the white triangle swatch) to the right side of the gradient.
Watching back the animation, the highlight will appear to react to the 'spinning' effect of the letters. However, the speed of the opacity fade and the rotation appears too slow. Let's refine the speed of these two parameters.
- 18 Click the Keyframes button in the interface toolbar.

TIP Press Cmd-F (macOS) or Ctrl-F (Windows) to expand the size of the Keyframes or Splines editors to accommodate all the node animations.

- 19 Expand the Merge1 and Text1 headers. These will reveal all the parameters you have animated, and their respective keyframes.
- 20 Drag the first keyframes (white horizontal lines) of the Blend and CharacterSizeX parameters to start on frame 65 of the time ruler.



When you play back the animation now, there will be a pause before the letters start to fade in. The speed of both the rotation and opacity will be increased due the keyframes being closer together.

As you can see, most keyframing can be accomplished directly from the inspector, using the time ruler as a reference for placement of keyframes. To make refinements, or to ease the speed of animation, you can access the Keyframe and Spline editors to gain more control over the behavior of the keyframes.

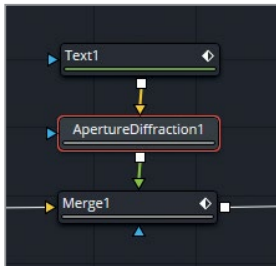
Adding Effect Nodes to the Pipeline

In this exercise, you will add a lighting effect to the gradient and a simple blur tool to imitate a shallow depth of field. An important question to ask yourself when adding new tools is where in the pipeline the node should be placed to give you the result you need.

- 1 Open the Effects Library.
- 2 Expand OpenFX and select ResolveFX Light. You will add an effect to the text to enhance the travelling gradient, turning it into a shard of light.

For this to work, the effect needs to be placed directly after the text node.

- 3 Drag the Aperture Diffraction effect onto the connection between the text and merge nodes.



- 4 At first, the light will look distorted. You need to refine the effect parameters to correctly impact the gradient values.
- 5 Increase the Result Gamma (3.0) to concentrate the brightness to the text gradient highlight.
- 6 Reduce the Result Scale (0.400) to limit the diffraction to a smaller area.
- 7 Reduce the Brightness (0.11) in the Compositing Controls to make the reflection more realistic.



To further enhance the text composite, you'll blur the image in the background to imitate shallow depth of field. Review your node pipeline and think about where the blur tool needs to be placed.

- If it is placed after the merge node, both the text and image will be blurred.
- If it is placed after the Aperture Diffraction, only the text will be blurred.
- The blur tool needs to be placed after MediaIn1 to only affect the background video.

- 8 Select MediaIn1.
- 9 Click the Blur tool button in the toolbar – it is the last button in the Color category.
- 10 Increase the Blur Size (10.0) until the image appears out of focus.



The text now stands out, but too much interesting information has been removed by the blur. Ideally, we'd still want the audience to see the spaceship in the background.

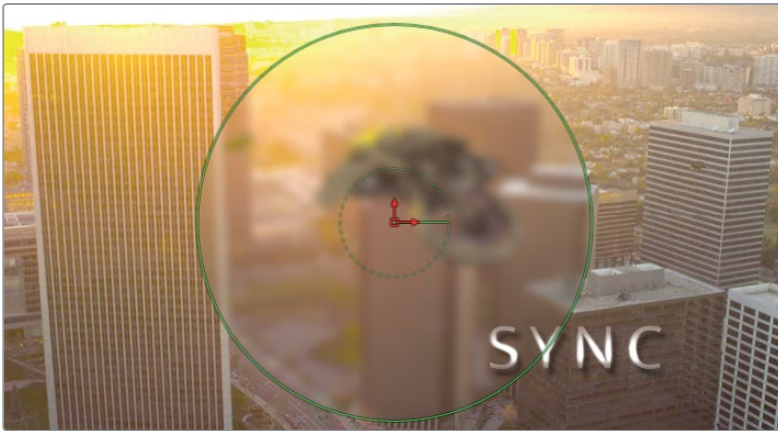
In the next exercise, you will use a mask to define which area of the image will be affected by the blur tool, and which area will be left in 'focus'.

When adding new nodes to a pipeline, you will occasionally need to pause and think about how various stages of the signal will be impacted. Occasionally, some experimentation may be necessary to review how the node impacts the final composite. Over time, this workflow becomes more intuitive and the placement of nodes more apparent.

Using Masks to Target Effects

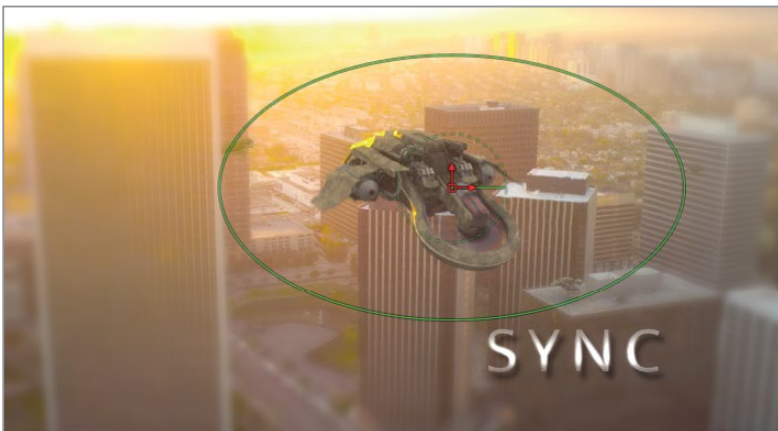
With the effect in place, you can now use a mask node to isolate which region of the image the tool affects. Mask nodes can be made based on preset shapes (rectangles, ellipses), custom drawn (polygons, b-splines), animated, or even based on luma/chroma data.

- 1 With the blur node still selected, click the Ellipse mask in the toolbar.



The blur effect becomes contained within a circle in the viewer. To create the effect of soft focus, you will need to invert the circle, and then soften its edges.

- 2 Select the Invert checkbox in the Inspector.
- 3 Increase the Soft Edge (0.18) setting to blur the circumference.
- 4 Scrub through the time ruler to check the position of the spaceship.
- 5 Use the controls in the viewer to adjust the position and size of the circle mask to keep the spaceship in focus throughout the shot.



Masks have a wide range of application when it comes to compositing. They are frequently employed in motion graphic design to achieve specific shapes and animations, they are frequently combined with chroma key workflows to eliminate unusable parts of a green screen, and they are also used for rotoscoping workflows, in which a subject is carefully traced to allow another image or video layer to be placed behind them.

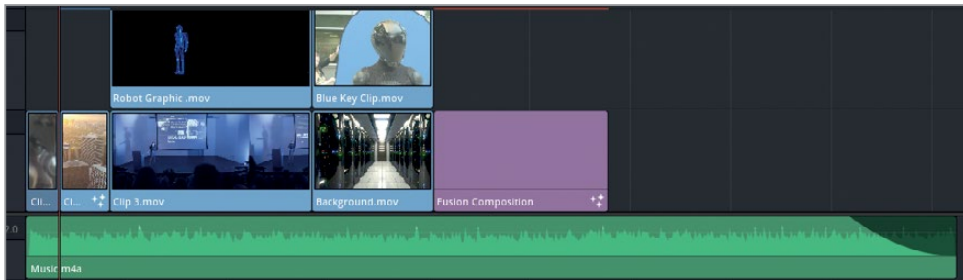
Creating Rolling Credits

With an understanding of node pipeline construction, you can now start to look at more dedicated industry motion graphic workflows. For example, depending on production scale and budget, it is frequently the role of the editor to create rolling credits at the end of a film. This can be easily accomplished in the Fusion page with the help of a text node, a keyframed transform node and some dedicated text parameters.

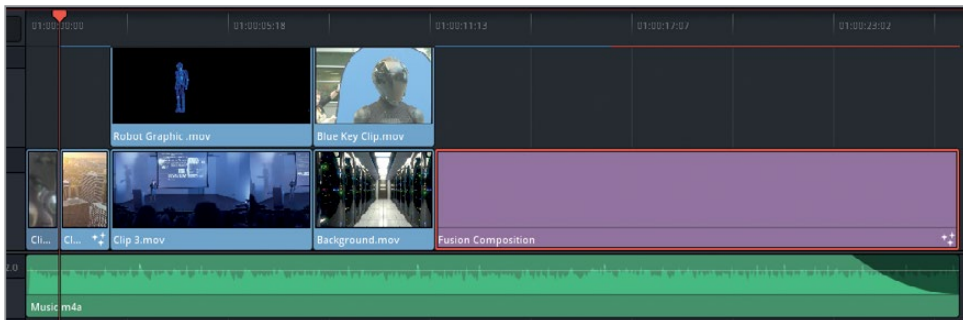
Generating a Blank Fusion Composition

First, you will need to create a blank Fusion composition to act as the foundation of your credit roll animation.

- 1 Click the Edit page icon at the bottom of the software interface, or press Shift-4.
- 2 Open the Effect Library from the interface toolbar at the top of the page.
- 3 Expand the Toolbox bin and select Generators.
- 4 Drag the Fusion Composition generator to the end of 01 Fusion timeline.

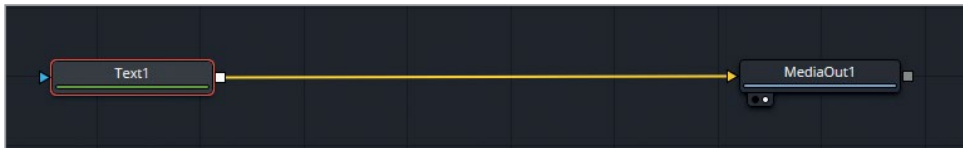


- 5 To adjust the duration, right-click the Fusion composition clip on the timeline and select Change Clip Duration.
- 6 Change the clip duration to 00:00:15:00.

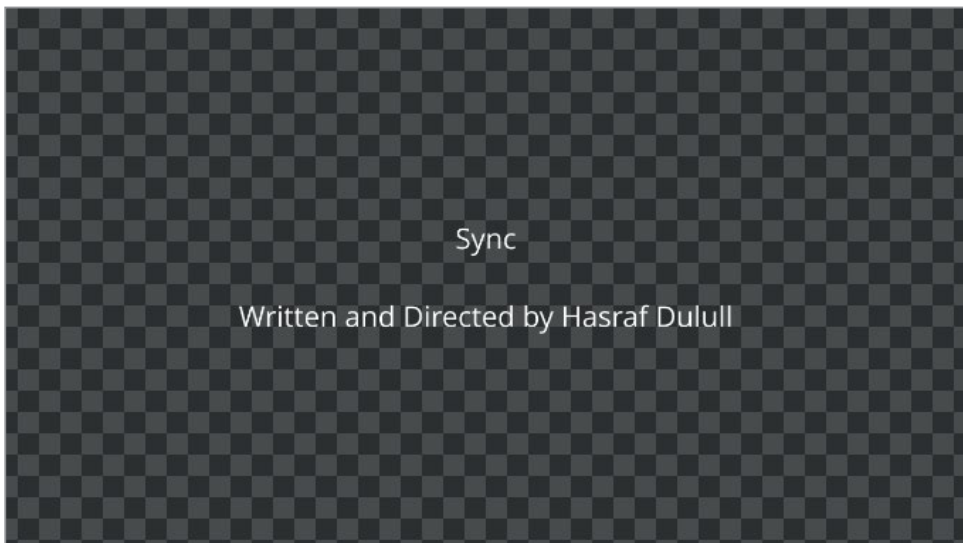


This will extend the blank Fusion composition to 15 seconds.

- 7 With your playhead on the Fusion composition, enter the Fusion Page.
This time, the node editor will only have a single MediaOut1 node. Unlike the previous exercises, there is no associated source media in the Fusion composition.
- 8 Drag the text tool from the toolbar onto an empty part of the node editor.
- 9 Connect the text tool output to the MediaOut1 input.



- 10 Enter the film title Sync into the Styled Text box of the Inspector.
- 11 Press the enter key two times and write Written and Directed by Hasraf Dulull.
- 12 Leave the font as Open Sans, but change the weight to Regular.
- 13 Reduce the font Size to 0.05



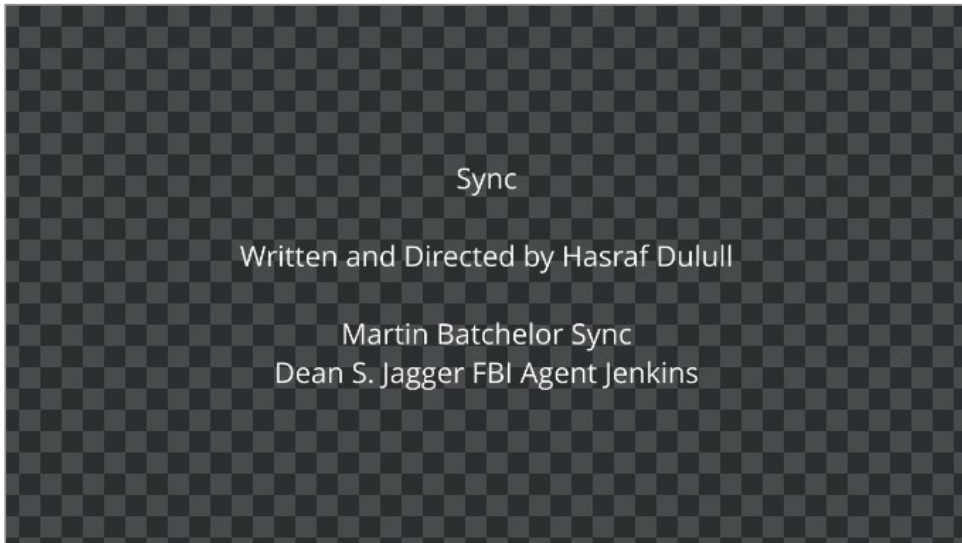
These are the two lines of text that you will want to keep centered. All the following credits, listing the actors and their roles need to be placed into columns.

Using Tab Spacing to Align Columns

Traditional rolling credits tend to appear as two columns of text aligned at the center. A parameter in the text node inspector allows you to quickly define and align columns of text within a single node.

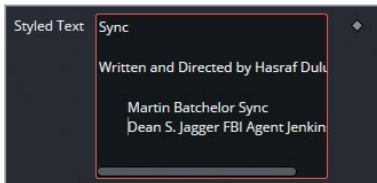
- 1 Press the enter key two times under the director's line in the Styled Text box.
- 2 Type *Martin Batchelor Sync*

- 3 Press enter and type *Dean S. Jagger FBI Agent Jenkins*



At the moment, the two actors' lines appear centered and difficult to read. Tab spacing will allow you to define the alignment of their names and roles. You can use the tab key on your keyboard (usually above the Caps Lock) to define multiple columns in your text.

- 4 Click in front of *Martin Batchelor's* name in the Styled Text box and press the tab key.
5 Click in front of *Dean's* name and press the tab key.



To define the second column in the credits, you will need to click in front of the roles and press the tab key again.

- 6 Click in front of the word *Sync* and press the tab key.
7 Click in front of *FBI* and press the tab key.

You've defined the columns, but the text appears to look worse in the viewer! This is because you have not specified the position or alignment of the columns.

- 8 At the bottom of the Inspector, expand the Tab Spacing category.
9 Under Tab 1, change the Position to -0.03.
10 Drag the Alignment all the way to the right (1.0) to line up the names.
11 In the drop-down menu next to Tab, select 2 to adjust the second tab column.
12 Change the position to 0.03.

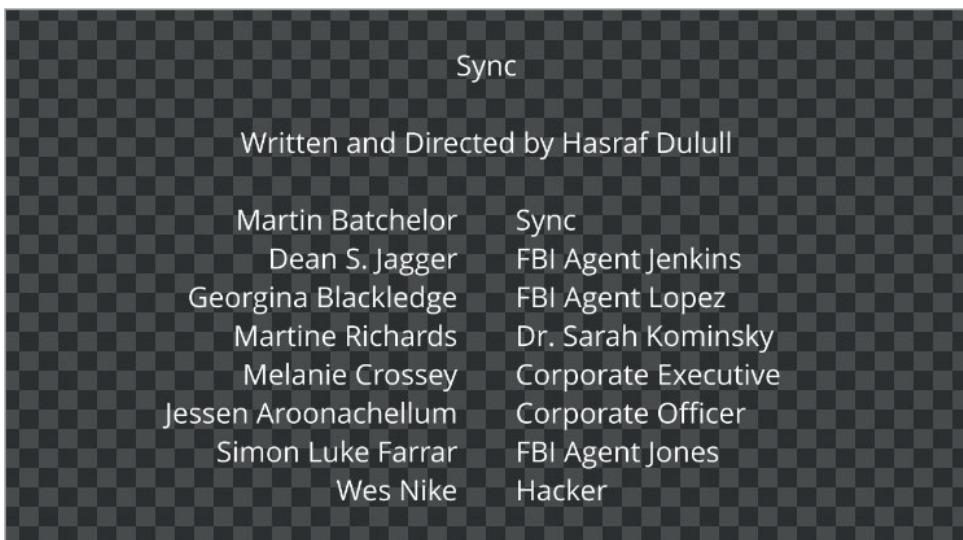
- 13 Drag the Alignment all the way to the left (-1.0) to line up the roles.



The actors' names now have a right alignment against the roles' left alignment. You can enter the rest of the names from this short film to complete the credits.

- 14 Open the R15 Editing 201 > Lessons > Lesson 08 VFX folder and launch Sync_Credits.rtf.
- 15 Copy the remainder of the cast list and paste it into the Styled Text box under the two lines you have already entered.

The tab information from the text document should travel across and automatically place the actors and roles into their respective columns. If it does not, use the tab key to define the columns in the Styled Text box.

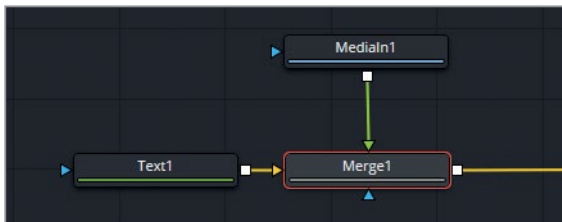


When preparing credits for a film, you can pre-emptively start defining the columns by pressing tab in front of names and roles. Tab information will carry across from most word editors and can immediately be used to define the position of credit columns.

Adding a Logo to a Credit Roll

As a finishing touch, you will merge a logo to the end of the credits sequence and use a transform node to have it scroll together with the text layer.

- 1 Open the Media Pool.
- 2 Enter the media bin and drag **Blackmagic_Design_alpha_logo.png** into the node editor.
- 3 Drag the output of the logo node to the output of the text node.



When connecting the output of one node to another, you automatically generate a merge node that will treat the first node as the foreground layer.

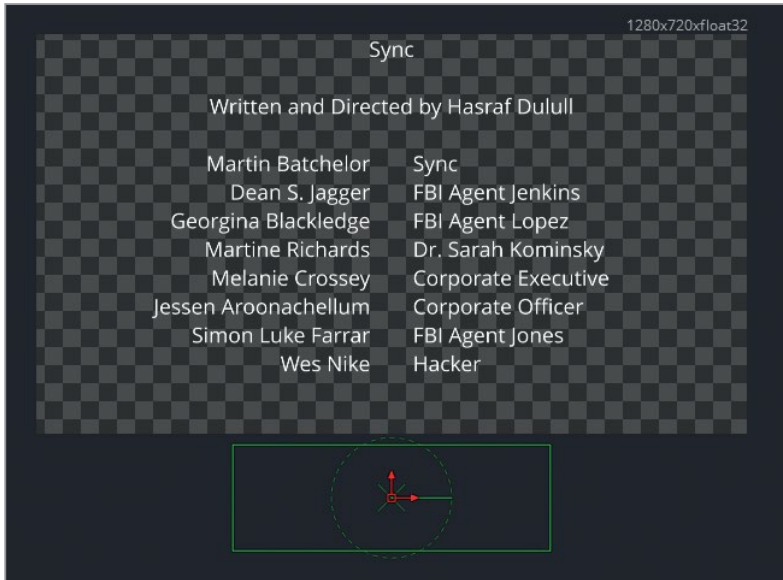
- 4 Rename MediaIn1 as LOGO.
- 5 The logo is too big and is overwriting the credits. You can use a transform node to resize and reposition the logo.



With the LOGO node selected, press the Transform node in the toolbar.

- 6 In the inspector, decrease the size to 0.60.
- 7 To make it easier to see where you are placing the logo, zoom out of the viewer until you can see the grey area around it.

- 8 Drag the Center Y parameter in the inspector, or use the on-screen controls to lower the logo under the credits.



With all the elements in place, you can now animate the credit scroll. The best place to do this will be in a transform node added after the merge, which will treat the credit and logo as a single combined layer.

- 9 Add a Transform tool after the merge node.
- 10 Drag the playhead to the first frame (0.0) of the composition.
- 11 Lower the Center Y value until the top of the credits are beneath the bottom of the viewer.
- 12 Press the keyframe next to Center Y to activate keyframing.
- 13 Drag the playhead to the last frame (359.0) of the composition.
- 14 Raise the Center Y value until both the credits and logo are off screen at the top of the viewer.
- 15 Playback the animation to check your credit scroll.

Credits and logos can be combined in numerous configurations using multiple merge nodes and a universal transform control.

Tracking a Scene

Tracking refers to a process in which the software detects the motion of a camera or subject based on the changing pixel values in a video clip. Once tracking data is extracted, it can be applied to other layers to create the illusion of those elements being part of the scene.

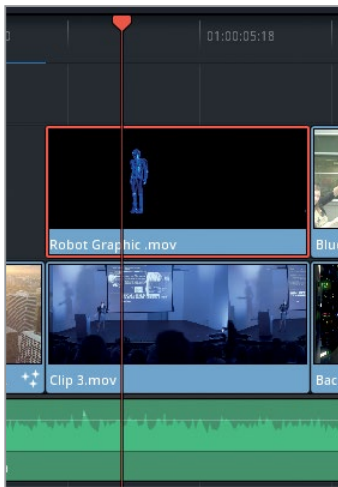
Tracking is a vital component of all compositing workflows that feature moving footage - whether you are inserting a 3D character, putting up a poster, replacing a screen or removing film equipment from a scene.

Creating a Fusion Clip in the Edit Page

When editing media that is intended for compositing – for example green screen and backplate footage - it is usually the role of the editor to define the cut points of both media clips. This tends to be easiest to do on the timeline of the Edit page.

Once the clip lengths are determined, they can then be transformed into a Fusion clip, where they will appear merged and ready for compositing on the Fusion page.

- 1 Click the Edit page icon at the bottom of the software interface, or press Shift-4.



The third clip in the timeline features a video of a presenter on stage with a robot graphic on the video track above it. You'll begin by rescaling and repositioning the graphic before proceeding to the Fusion page.

- 2 Select the robot graphic clip.
- 3 Open the Inspector in the Edit Page.
- 4 Lower the opacity to 50.00 to see through to the background image.
- 5 Click the Transform button in the lower-left corner of the viewer.
- 6 Use the on-screen transform controls to resize and reposition the robot onto the stage.



- 7 Set the opacity back to 100.00.
- 8 Select both the robot graphic and clip 3 on the timeline.
- 9 Right-click and choose New Fusion Clip.
- 10 Enter the Fusion page.
The two clips will now appear merged in the newly created Fusion clip.
- 11 Rename the clips as BACKPLATE and ROBOT.
To remove the black background from the robot graphic, you will use a blending mode that subtracts dark areas from a foreground layer.
- 12 Click the merge tool and set the Apply Mode to Screen.

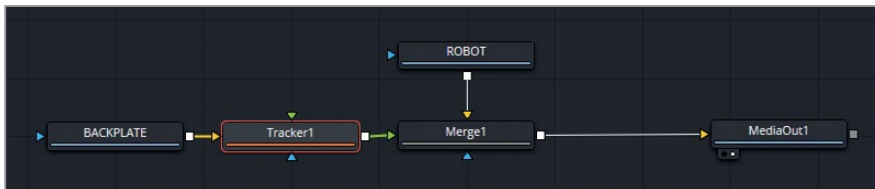


With the clips merged in the Fusion page, you can now proceed to track the backplate and apply the data to the foreground graphic.

Using the Tracker Node

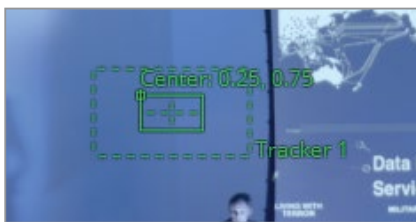
The tracker tool allows you to define a specific area in the frame that is a reliable reference for the movement of the camera, or to a visible item in the shot. Ideally, you want to specify an area that is always in shot, and located on the same plane as the object you want to add to the scene.

- 1 Drag the playhead to the first frame of the clip in the time ruler. This will make it easier to perform a track, as you will only need to analyze the footage in one direction.
- 2 Select BACKPLATE to indicate the media you wish to track.
- 3 In the Effects Library, locate the Tracking folder and click on the Tracker tool node.



Tracker1 appears between the BACKPLATE and merge node. A green tracker outline appears in viewer 2.

Hovering over the tracker in the viewer reveals two boxes. The inner box defines the 'pattern' that the program will search for in every frame of the clip. The outer box is the search area within which the program will search for the pattern. If the pattern travels beyond the confines of the search area from one frame to the next, the track will be unsuccessful.



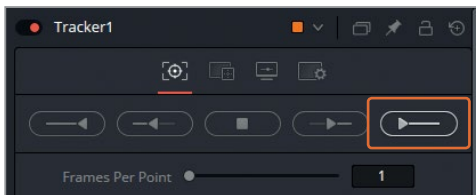
When performing pattern selection, aim to pick an area with high contrast, sharp focus and reliable movement in relation to the scene. The search area must also be reshaped to match the projected movement of the clip (i.e. a larger search area is necessary for a clip with rapid movement). In both cases, the larger the box, the longer the analysis will take to perform.

- 4 Click the upper-left corner of the tracker and drag it down onto the lower-right corner of the projection screen in the shot. The dark geometric shapes against the white surface make an ideal tracking pattern.

- 5 Drag the lower-right corner of both boxes to expand the size of the pattern and elongate the search box in preparation for the panning camera motion.



- 6 At the top of the Inspector, click the Track Forward button.



Keep an eye on the pattern as the track is performed. If the tracker loses its place at any point, it's best to terminate the action instead of continuing with an unusable track analysis.



- 7 A pop-up window will verify if you want to stop the render. Click Yes to confirm.

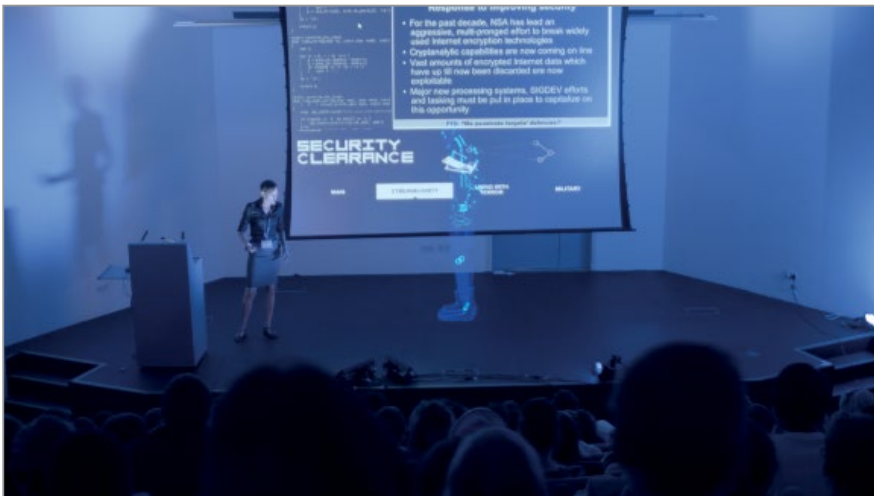
TIP Double clicking in an empty gray space in the node editor will temporarily hide on-screen controls. Select the tracker node to return the on-screen controls to the viewer.

Next, you will apply the gathered tracking data to the robot to match its movement to the motion in the background.

- 8 Click on the Operation tab at the top of the inspector.
- 9 Change the Operation to Match Move.
- 10 Change the Merge option to FG over BG. This specifies to the tracker that any foreground element will be match moved to the motion tracked in the background. At the moment, the tracker node does not have a foreground signal.

- 11 Drag the output of the ROBOT node to the green foreground input of the tracker.
- 12 Like the merge node, the tracker node also offers blending mode options. Change the Apply Mode in the inspector to Screen in order to blend the robot graphic into the backplate.

Since the tracker is now performing the function of merging and blending the graphic, the merge node has become redundant.
- 13 Delete the merge node.
- 14 Drag the playhead through the time ruler to verify that the track has been successful.
- 15 To better blend the graphic into the background, add a blur node after the ROBOT node and leave the gentle default blur size 1.0.
- 16 Drag the Color Corrector tool from the toolbox and attach it to the connection after the blur node.
- 17 In the inspector, drag the master wheel towards cyan to make the graphic a greener shade of blue.



You can also add another Transform tool to the ROBOT connection line to make changes to the scale or positioning of the graphic.

Match moving is the central principle behind placing artificial elements into a scene with camera movement. Amongst its most popular applications is sky replacement, sign removal, cover-up and paint work, compositing of 3D characters and vehicles, and much, much more.

Keying and Compositing

Chroma keying refers to any process in which a portion of the frame is targeted based on its color properties. Most frequently, this is associated with removing blue or green screen to leave the foreground subjects on a transparent background. These subjects can then be placed over any other layer, giving filmmakers complete control over their environment.

Pulling a Key

In this exercise, you will key a subject from a portable blue screen and place them into a new environment.

- 1 Go to the Edit Page.
- 2 Select Blue Key Clip and Clip 4 on the timeline, right-click and choose New Fusion Clip.
- 3 Rename MediaIn1 as BACKPLATE and press 1 to view it in the left viewer.
- 4 Rename MediaIn2 as BLUESCREEN and press 2 to view it in the right viewer.

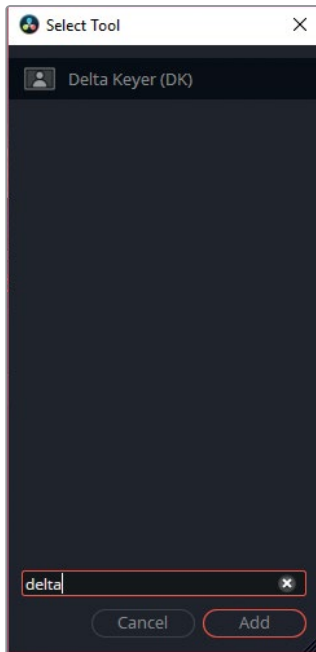


As you can see, the BACKPLATE node features an interior background onto which you want to composite the character. The BLUESCREEN node features the shot of the character in front of a portable chroma blue screen. The first step in this composite will be to key out the blue screen.

- 5 Select the merge node and press 2 to view it in the right viewer.
- 6 Select the BLUESCREEN node.

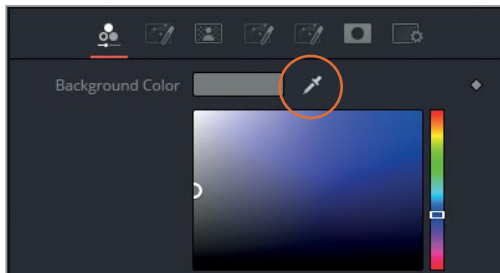
So far, you have been adding new tools and nodes using the Effects Library and the toolbar. There is a third way to quickly add nodes to pipeline with the help of a simple shortcut.

- 7 Press Shift-spacebar to bring up the Select Tool dialogue window.
- 8 Type *delta* into the search bar at the bottom.

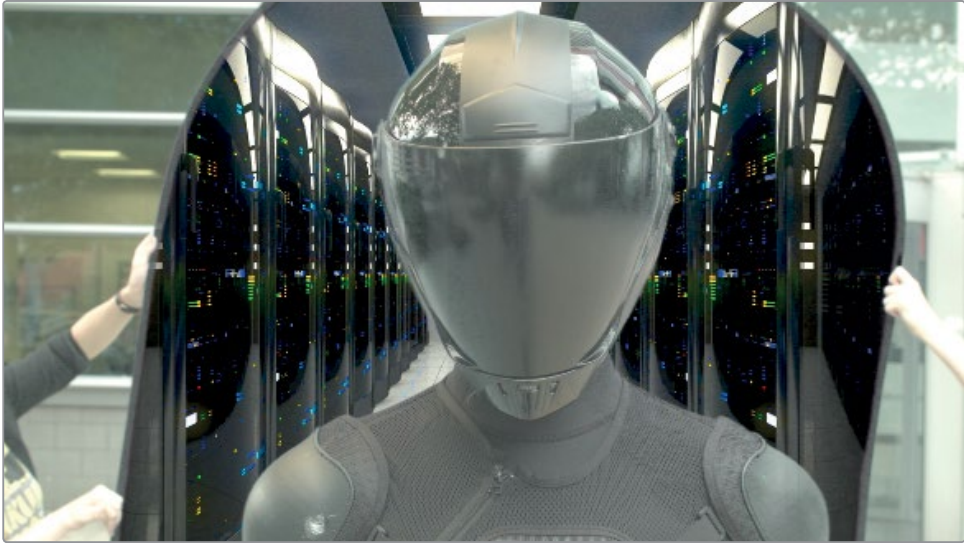


The Select Tool will filter any tools that contain a search term as you type. This is one of the quickest ways to add nodes to the editor, provided you already know their names beforehand.

- 9 Select Delta Keyer (DK) and press Add.
- 10 To extract the blue screen, click and hold the eyedropper tool next to the Background Color swatch in the inspector, and drag your mouse across to viewer 2.



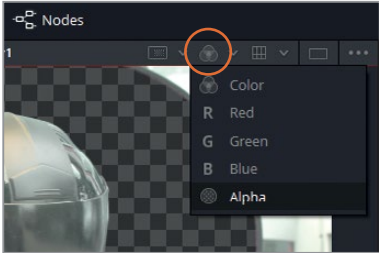
Release your mouse over the blue screen to grab a chroma sample.



11 You will immediately see the result of extracting the selected blue hue. However, this is just the first step of the keying process. You now need to review the quality of the key and clean it up.

Select the delta keyer node and press 1.

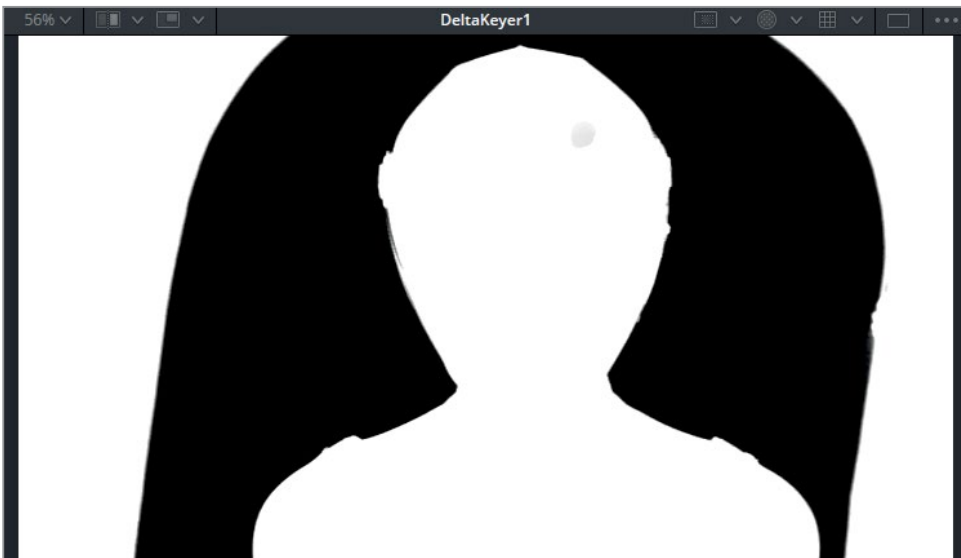
12 In viewer 1, press the Color drop-down menu and choose Alpha to reveal the alpha channel of the key.



A good key should be black and white – with black representing transparency and white representing full opacity. At the moment, the matte has too many grey areas, which will result in semi-transparency in the top layer.



- 13 To clean up the matte, enter the Matte tab in the inspector.
- 14 Drag the Low Threshold right until you no longer see gray areas in the black background.
- 15 Drag the High Threshold left until the character in the foreground turns a solid white.
- 16 Drag Clean Foreground to the right until the reflection on the helmet is reduced.

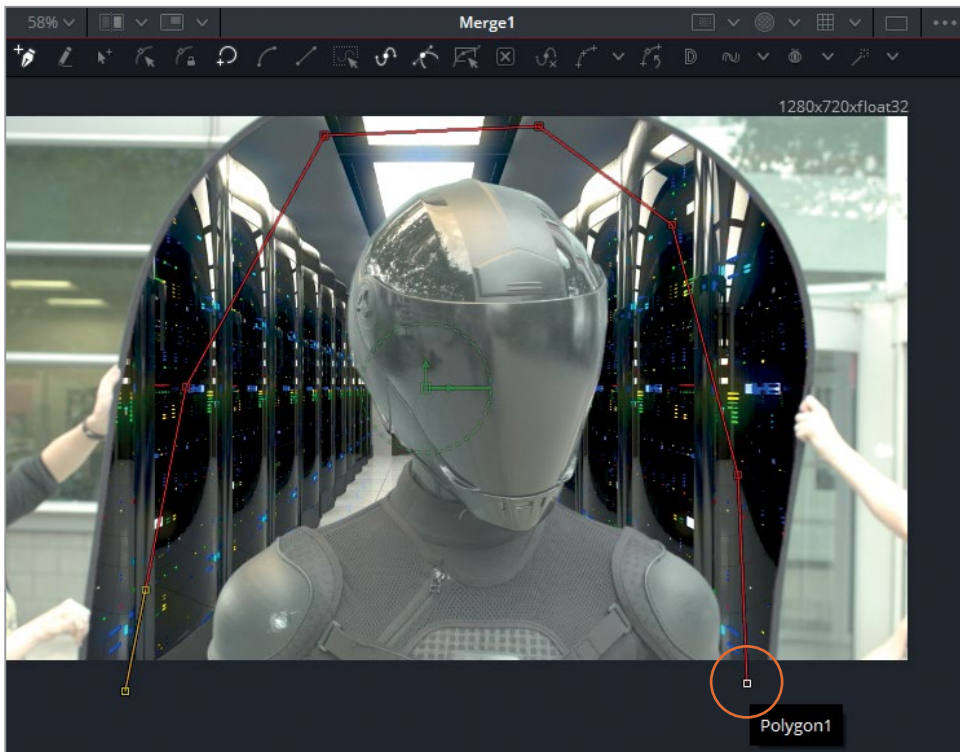


The matte looks much cleaner now. However, looking at the merged image, it is obvious that there is still a lot of unnecessary information that needs to be removed from the edges of the foreground layer.

Creating a Garbage Matte

In a previous exercise, you used a matte to define which area of the frame should be impacted by an effect node. In this exercise, you will use a polygon matte to refine what you want to keep visible in the foreground layer. This type of mask is known as a garbage matte.

- 1 Drag the polygon tool from the toolbar onto an empty part of the node editor.
- 2 Drag the playhead to the first frame of the clip.
- 3 Click around the character in viewer 2. If necessary, zoom out of the viewer to make it easier to click outside the frame.

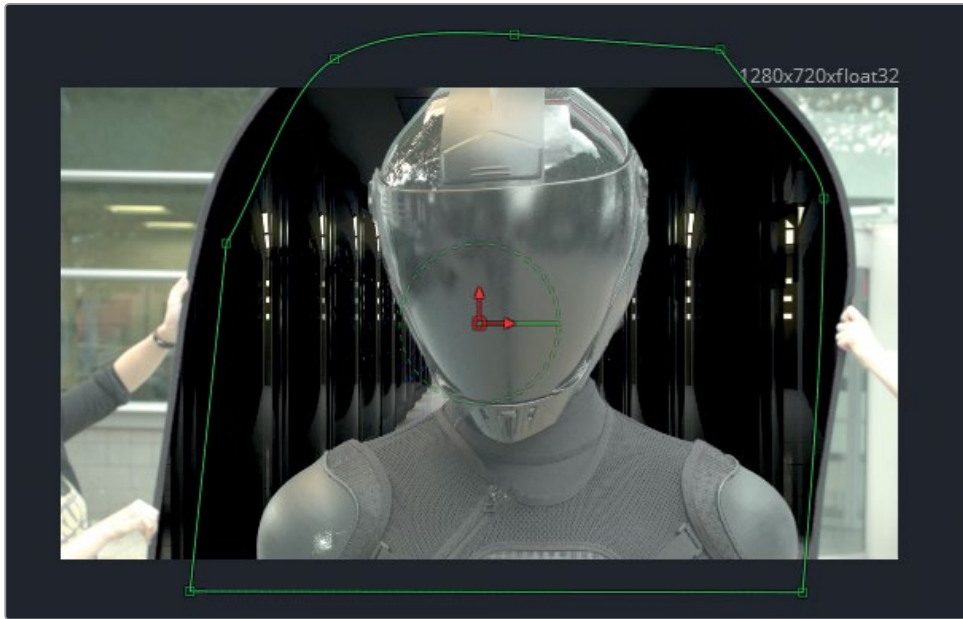


When creating custom polygon shapes, you need to click on the first point you made last to close the shape loop.

- 4 Next, you will need to animate the polygon shape as the camera pushes in. By default, all polygon shapes will automatically animate as you make changes to them on different frames on the time ruler.

Drag the playhead to the last frame of the clip.

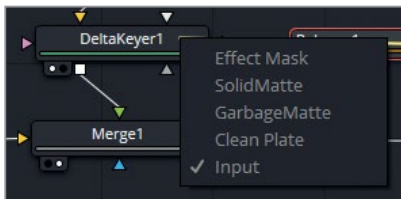
- 5 Adjust the polygon corners to fit the new frame.



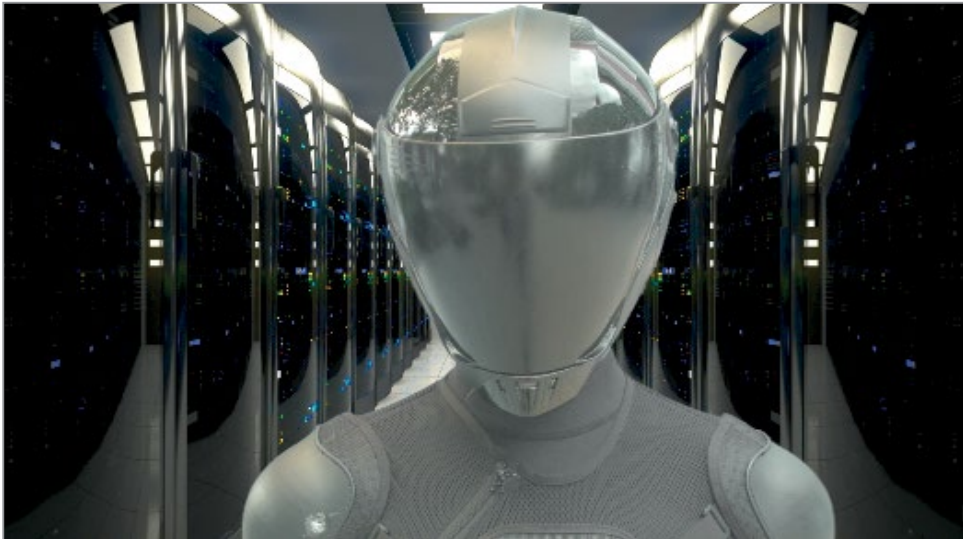
- 6 Move to the center of the time ruler, and adjust the points further, if necessary. Keep making changes up and down the time ruler until the polygon moves smoothly with the character.
- 7 With the garbage matte completed, you can now connect it to the delta keyer node. The delta keyer has several dedicated inputs based on your workflow, supporting clean plates and solid mattes.

TIP The Status bar in the lower left corner of the interface shows basic metadata about any node you hover over.

Hold the Option (macOS) or Alt (Windows) key and drag the polygon output to the delta keyer node.



You will see a drop-down menu prompting you to indicate the input you would like to use.



The edges of the frame will disappear from the foreground layer, revealing a clean extraction of the subject.

Compositing Layers using Color Correction

The two layers can now be clearly seen, but do not match due to their different filming conditions and color spaces. You will use a color corrector node to match the foreground to the background, and then add an additional color corrector at the end of the pipeline to create a single look for the scene.

- 1 Select the delta keyer node.
- 2 Press Shift-spacebar and type in corr.
- 3 Select the Color Corrector tool and press Add.

To better match the appearance of the foreground layer to the background, you will need to substantially darken the image.

- 4 Drag Lift left to darken the shadows (-0.5).

The foreground character becomes darker, but the background is affected too! This is occurring because the color correction tool is applied to the full frame of the video, with no regard for the mask (or alpha channel) of the BLUESCREEN layer.

When making adjustments to the brightness or color of a node with transparency, you will need to specify to the color correction tool to affect only the areas defined (or 'premultiplied') by the alpha channel.

- 5 To fix the issue caused by premultiplication, open the Options tab of the color corrector.
- 6 Select Pre-Divide/Post-Multiply.

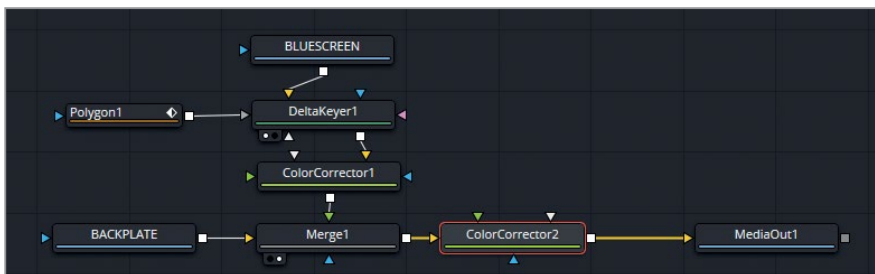
The grade is now limited to the foreground character layer.

- 7 Return to the Correction tab to continue grading.
- 8 Drag Gamma left to darken the midtones (0.75).
- 9 Drag Contrast left to reduce the contrast and bring the highlights closer to the shadows (0.70).
- 10 Drag the center of the color wheel slightly towards magenta to undo the green tint in the midtones of the image.
- 11 The highlights of the image are also very warm. At the top of the inspector, change the Range to Highlights.
- 12 Drag the center of the color wheel towards blue/cyan.



With the layers matched, you can now apply a uniform look to the clip.

- 13 Add a new color corrector node after the merge node.



You'll aim for a cold, futuristic look.

- 14 First, lower the gamma and increase the gain to increase contrast in the image.
- 15 Drag the master color wheel towards cyan/blue to make the image cooler.
- 16 Switch the Range to Highlights.
- 17 Drag the highlights color wheel towards magenta to give a slight tint to the lights in the ceiling and the reflections on the suit.
- 18 Switch the Range to Shadows.
- 19 Drag the shadows color wheel towards green to give the overall look a more 'techy' feel.



The final grading node was effective in compositing the two layers together, helping sell the look of the overall environment. In clips where there is a change of lighting conditions (such as the light going out at the end of this scene), you can also use keyframing to animate colors and luminance values over time.

Fusion is used for professional-grade visual effects work in film and television. Its tools offer a wide breadth of functionality, ranging from subtle coverup work, motion graphic design and animation, to eye-catching particle generators, 3D assets, green screen keying and set extension.

Due to this impressive variety of tools and their parameters, it might take some time to discover and master all of them. The DaVinci Resolve 15 User Manual includes more in-depth explanations of all the Fusion features and the *The Visual Effects Guide to DaVinci Resolve 15* is a good follow-up to this training manual.

Lesson Review

- 1 True or False: It is possible to have more than one MediaIn node in a composition.
- 2 What type of node do you need to combine media and generator nodes (like text) into a single pipeline?
- 3 Which inspector tab should you use if you want to add a drop shadow to text?
- 4 Which of the following would be inappropriate to use as a tracking point?
 - A) Corner of a building
 - B) Stickers on a desk surface
 - C) Leaf on a tree
 - D) Pen mark on actor's face
- 5 True or False: You can animate color correction effects.

Answers

- 1 True. MediaIn nodes are a link to the source media in the Media Pool. When compositing multiple layers, there will be a dedicated MediaIn node for each image and/or video source.
- 2 The merge layer. It has a foreground and background input to indicate the layer order of media/generator nodes. A new merge node is required for every additional layer.
- 3 The shading tab. In this tab, you will find advanced controls for the text fill, outline and shadows.
- 4 Leaf on a tree. In all other scenarios, the tracking point will behave in a predictable manner (in the case of the actor, it's assumed we are adding/removing something from their face). Leaves tend to move with the wind, which makes them unreliable tracking points.
- 5 True. Any parameter with a keyframe icon next to it can be animated. This includes transform controls, text parameters, effects, and color values.

Lesson 9

Building and Mixing the Soundtrack

Your project's soundtrack is an essential part of the overall audience experience. Fortunately, while the Fairlight Page in DaVinci Resolve 15 is designed to create big Hollywood soundtracks, you'll find it familiar enough for you to use as an editor.

In this lesson, you'll explore techniques for audio editing, sound design, and final mixing, including "sweetening" your soundtrack as you apply professional equalization, dynamic controls, panning, and automation to your tracks.

The goal of mixing and mastering is to balance the levels coming from each track so they sound good as a whole. You do so by making subtle changes to the track levels or combining similar tracks into submixes to make them easier to control with a single fader. The final master needs to sound great and meet delivery standards for Loudness. Fortunately, the Fairlight page includes everything you need to make sure the levels are right on target.

Time

This lesson takes approximately 80 minutes to complete.

Goals

Preparing the Project	282
Setting up the Fairlight Page	283
Editing in the Fairlight Page	288
Panning Tracks in Acoustic Space	296
Normalizing Clip Levels	299
Working with Clip Equalization	300
Controlling Dynamic Range	314
Automating Track Changes	318
Simplifying Mixing using Buses	323
Creating Additional Output Buses	332
Assigning the Music and Effects Tracks	336
Monitoring Loudness in your Mix	337
Lesson Review	341

Preparing the Project

Before you start, let's take a moment to open the project and get acquainted with the bins and timelines that you'll be using throughout this lesson. Also, because you'll be working in a new interface page, it's a good idea to reset the DaVinci Resolve 15 user interface (UI) so your interface will match the screenshots and descriptions in this book. Then, you can customize your workspace, as needed, while you work your way through the lesson.

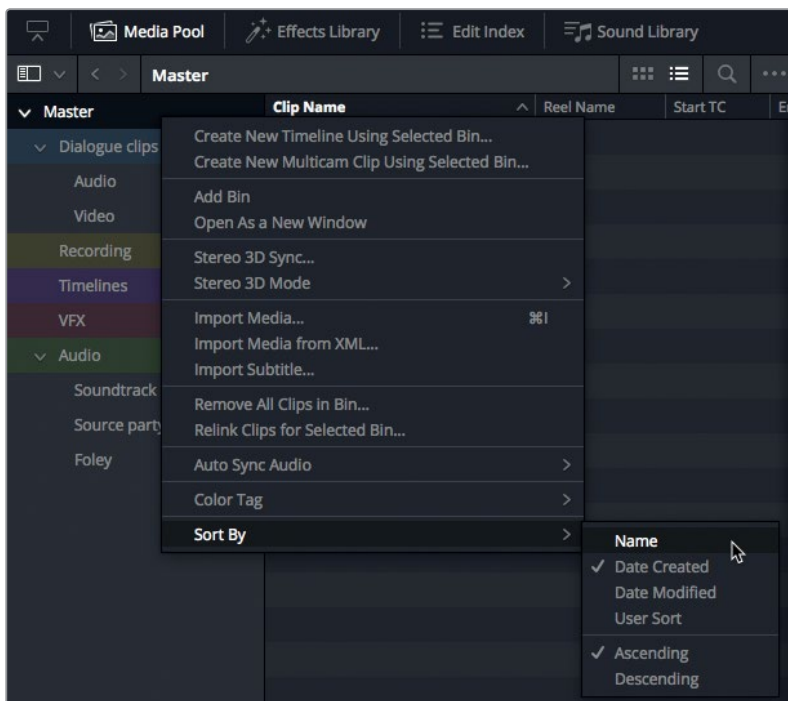
TIP Ideally, you'll want to have a good set of speakers or headphones connected to your computer for this lesson to appreciate the audible subtleties.

1 In the Project manager, right-click and choose Import. Navigate to R15 Editing 201 > Lessons > Lesson 09 Audio. Select R15 Editing Lesson 09 Audio.drp. Choose Open, and click OK to import the project into your Project manager.

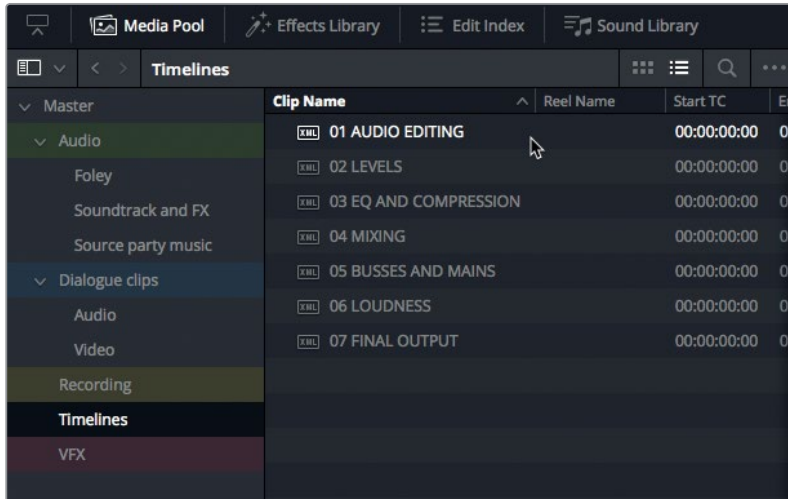
2 Open the project, and relink media files.

In the Media pool, you can see a series of bins that contain the elements of your scene with the Doctor and the FBI Agents.

3 Right-click the Master bin, and choose Sort By > Name to organize the bins by ascending alphabetical order.



- 4 Select the Timelines bin, and if necessary, switch to list view.
This bin contains seven timelines for the exercises in this lesson.
- 5 Click the File Name column header to sort the bin in ascending order.



- 6 Double-click the 01 AUDIO EDITING timeline to open it.
- 7 Play through the timeline to reacquaint yourself with the scene.

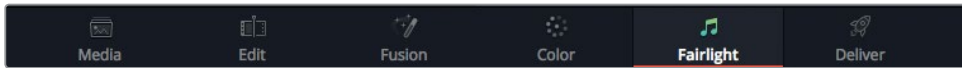
For all intents and purposes, this process of enhancing the sound of your audio tracks could be called *audio correction*. You enhance, or sweeten, each track's four fundamental elements—equalization, dynamics, pan, and volume level—so your tracks complement each other in the final mix.

DaVinci Resolve 15's controls enable you to manipulate all four of these elements on every track without additional plug-ins or patching. Keep in mind that each of these controls could fill an entire lesson on their own, or even a book; however, for the purpose of this advanced editing instruction, you'll gain a basic understanding of how these controls work and when you might need to apply them to your projects.

Setting up the Fairlight Page

Moving a project from picture edit to audio post has never been easier than it is in DaVinci Resolve. That's because Resolve is the only professional editing system that also includes the Fairlight page, which is a fully functional digital audio workstation (DAW). As you work your way through the following exercises, you'll find that many Fairlight page features function similarly or identically as in the Edit page.

- 1 At the bottom of the Resolve window, click the Fairlight button to go to the Fairlight page.



- 2 Choose Workspace > Reset UI Layout.

The default Fairlight layout shows only the audio tracks, toolbar, and transport controls. Also, the Fairlight timeline appears with plenty of room allotted for working on additional audio tracks. Let's resize the current tracks to better fit the available workspace.

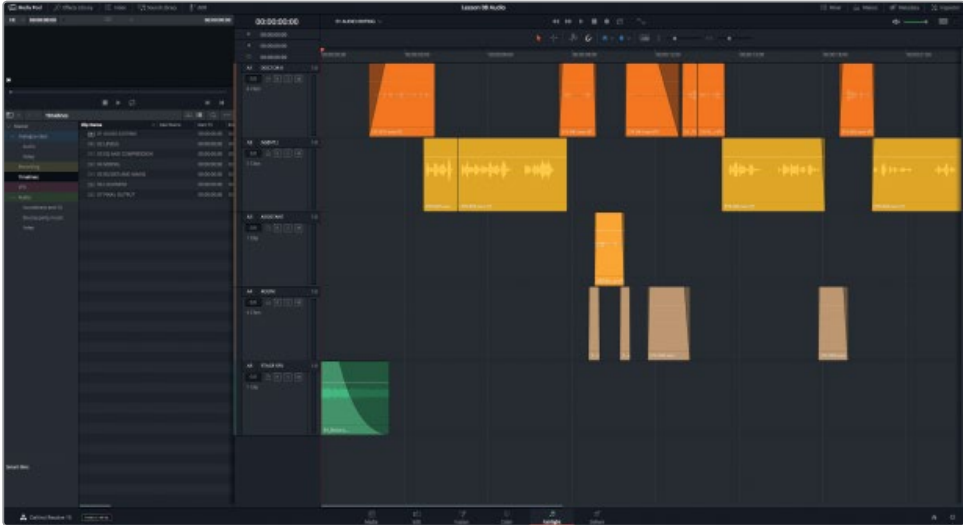
- 3 Press Shift-Z to fit the timeline clips horizontally, if necessary.
- 4 Fit the audio tracks vertically in the timeline window by holding down Shift and scrolling your middle mouse wheel.

TIP On a trackpad, scrolling up zooms in and scrolling down zooms out. Keep in mind that when zooming a Fairlight timeline, the focus remains on the playhead followed by the selected track.



The default Fairlight workspace focuses entirely on the audio tracks in the timeline and the audio clips in the Media pool. However, you can use the buttons at the top of the window to show or hide additional interface panels, as needed.

- 5 At the upper-left of the Resolve window, click the Media pool button to show the Media pool, including the Fairlight Page's Media pool preview player. Click the Timelines bin, if necessary, and switch to list view.



TIP By default, the Media pool in the Fairlight Page displays only audio clips or clips that have audio. You can choose to change this behavior in the Media pool options menu in the upper-right corner.

- 6 At the upper-right of the Resolve window, click the Meters button to open the monitoring panel.



In the monitoring panel, you can monitor all of the audio and video contents of the current timeline.

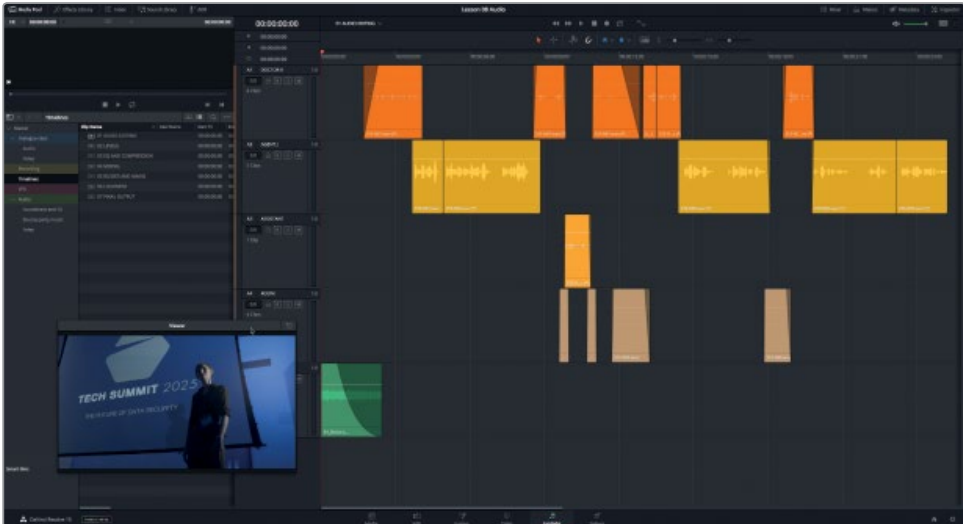
For the moment, you only need to see the viewer in the monitoring panel. So, this is a great time to expand the viewer as a separate window and hide the meters.

- 7 In the lower-right corner of the viewer, click the expand button to turn the viewer into a floating window.



The viewer appears in the middle of the interface. Now, you can drag the top of the viewer to move it.

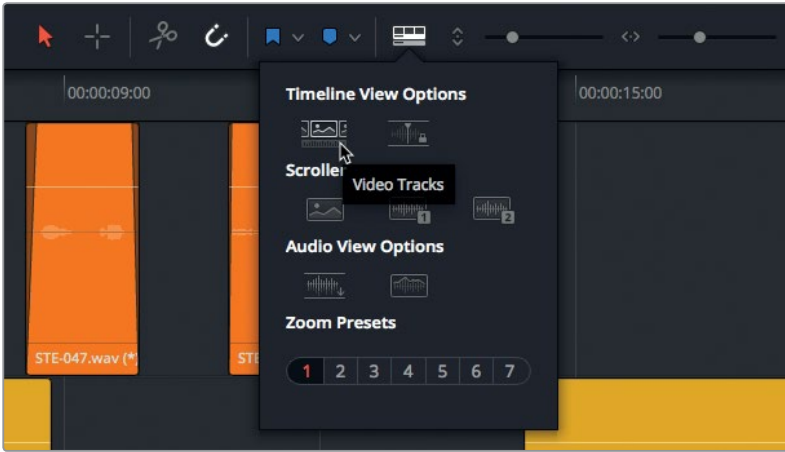
- 8 Click the Meters button to hide the monitoring panel.
- 9 Move the viewer to an unobtrusive position on your screen. Feel free to resize or move the viewer at any time as you work through these exercises.



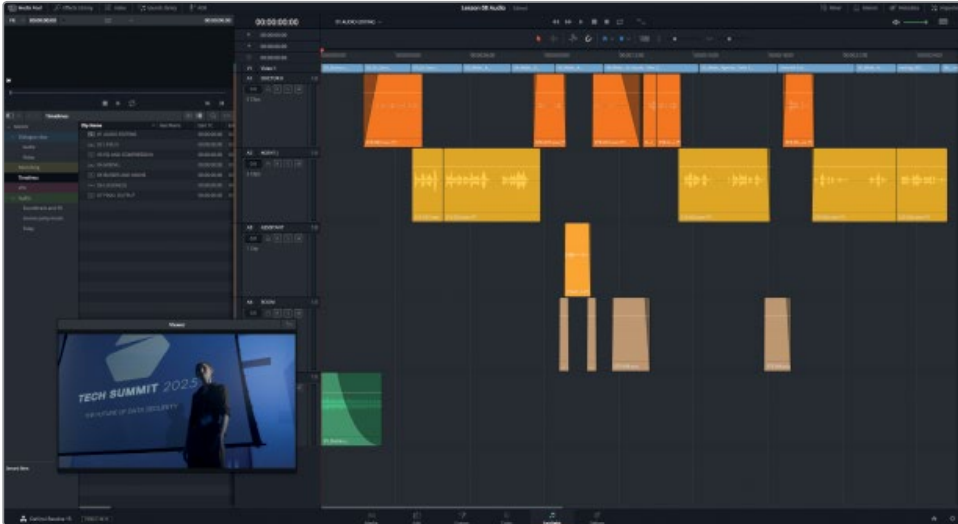
NOTE If you are using Blackmagic Design hardware to output the video from your Resolve workstation to a client monitor, you don't necessarily need to use the preview viewer because the video output will still be maintained when working in the Fairlight page.

You can also view the clips on your video tracks in the Fairlight Page.

- 10 Click the Timeline View options button, and select the Video Tracks option.



The video tracks in your timeline are now viewable, but not editable. They will be useful to see where the clips start and stop.



Now, you are ready to start your first audio post-production role!

Editing in the Fairlight Page

When you begin to think about sound effects, the first step is to just watch a scene without any audio. That's right, totally silent. By watching a scene with the audio muted, your imagination can fill in the blanks and allow you to think about all the scene audio you might expect to hear or would like to hear.

- 1 In the audio monitoring controls, click the mute button.



The mute button turns red to indicate that audio playback is muted.

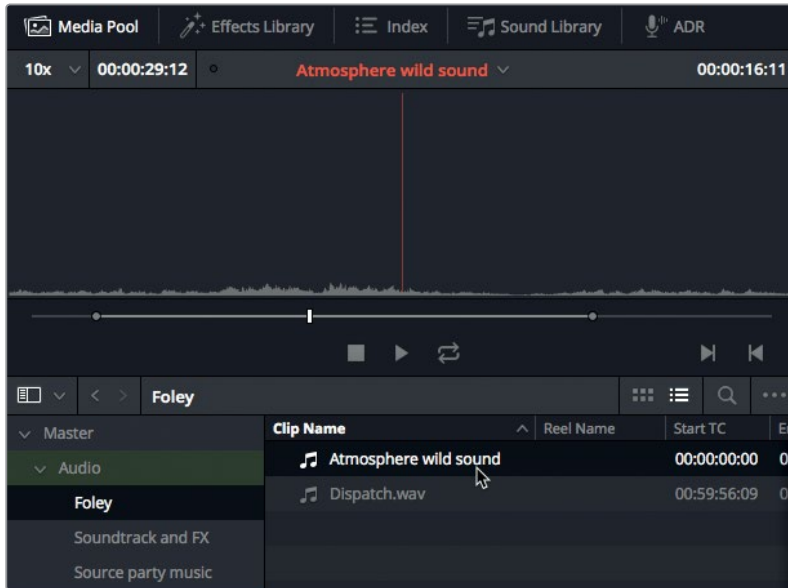
NOTE The slider to the right of the mute button allows you to change the level you are using to monitor the audio playback from Resolve while the DIM button is used to lower the playback volume to allow you to chat with your client, while keeping half an ear on the mix.

- 2 Play the timeline from the beginning.
During playback, make mental notes as to what sounds (other than dialogue) should be included to make the scene seem real to the audience. Also, think about moments in the scene that might benefit from the addition of music, sound effects, or something extra to elevate the moment.
- 3 Click the mute button to unmute playback.
- 4 Play the timeline again from the beginning. During playback think about which sound elements are still needed to enhance the scene.

TIP You may want to add markers to remind yourself of the different sounds that may be needed to enhance this scene. Feel free to add any you may think of, so you can later refer to the markers tab in the Index to easily locate these sections.

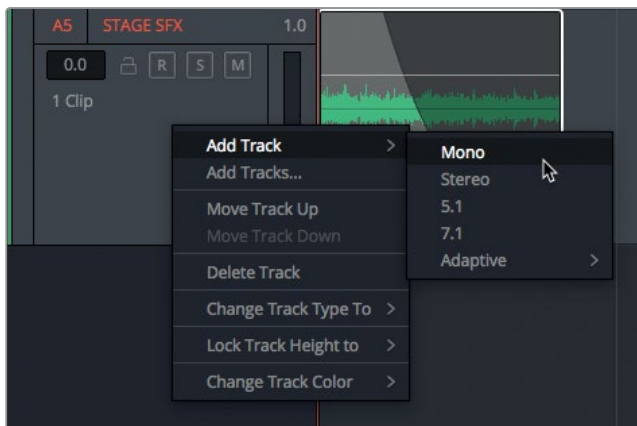
Chances are, the soundtrack elements that you imagined will seem even more necessary during this playback. First, you need to add some background to this scene to make it feel as though the room is full of people.

- 5 In the Media pool, in the Audio bin, select the Foley bin.
- 6 Select the **Atmosphere wild sound** clip.

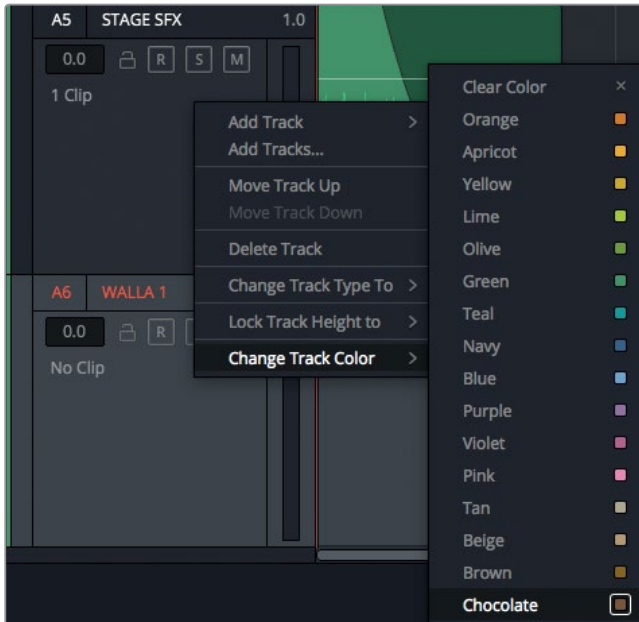


You can play this clip in the Media pool preview player in a similar manner to the Source Viewer in the Edit page, including adding in and out points, as necessary.

- 7 In the timeline, right-click in the track headers and choose Add Track > Mono.

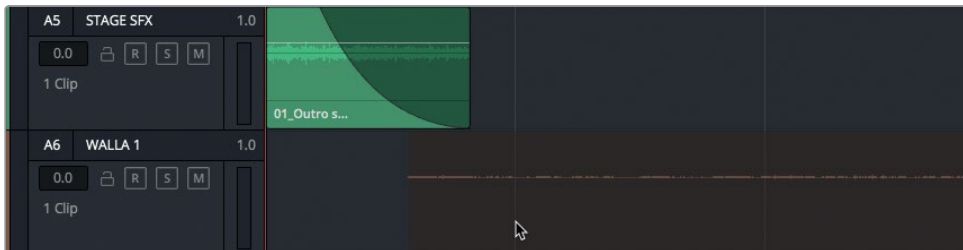


- 8 Rename the track **WALLA 1**, right-click its track header, and choose Change Track Color > Chocolate.

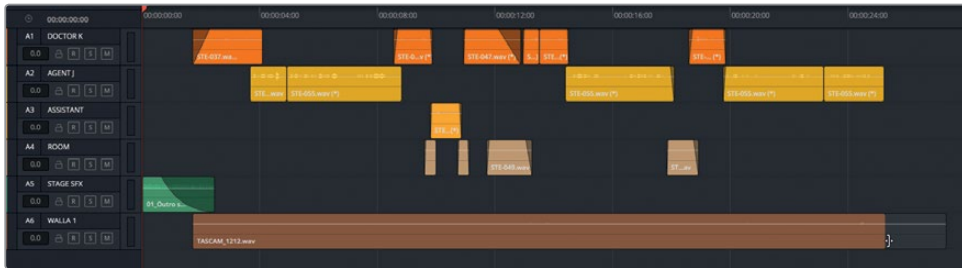


TIP A “walla” track is a background track that consists of the general murmur of people talking without any actual discernable conversation.

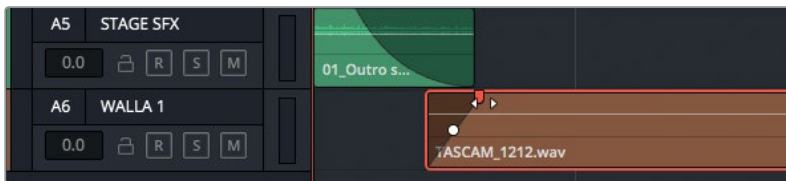
- 9 Drag the **Atmosphere wild sound** from the Media pool player to the WALLA 1 track, starting at the first line from the Doctor on A1.
The audio clip inherits the same color as the track, but it’s a little too long for this scene.



- 10 Trim the end of the clip to the end of the last dialogue clip from the FBI Agent on A2.



- 11 Drag the fade handles at the start and end of this clip to fade the background sound in and out of the scene.



- 12 Press Home, and play the scene to hear how the sound effect fits.

Building up Sound Effects

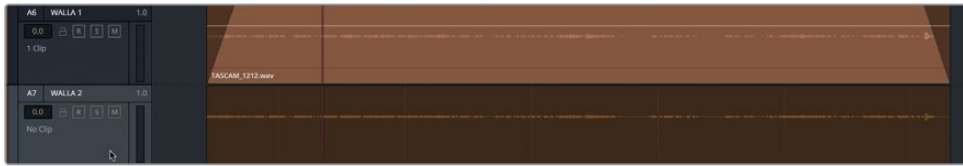
One common sound design trick used in both music production and soundtracks is to double a track to thicken, or fatten, the sound. Sound is cumulative, so more tracks equals more sound.

For example, if you had a recording of 10 people in a room murmuring to each other like party guests, it would sound like ten people in a room no matter how loudly you played the track in the mix. However, if you were to copy (double) the track, place the same audio clip on a duplicate track, and offset it slightly so it didn't play in sync with its duplicate, the result would sound more like a roomful of people. As it happens, this scene's party track sounds like a handful of people (probably the ones you see in the background). To really "sell" that an auditorium full of people are at the gathering, you'll want to double-up (or possibly even triple-up) the walla track.

You'll need to duplicate the clip and offset it just slightly so that it sounds like more people and not just an echo. Then, you'll apply a couple of tricks to further differentiate it from the first track.

- 1 Right-click the WALLA 1 track header, and choose Add Track > Mono. Rename this track **WALLA 2**, Right-click the track's header, and choose Change Track Color > Chocolate.
- 2 Select the clip on the WALLA 1 track, and choose Edit > Copy, or press Cmd-C (macOS) or Ctrl-C (Windows).
- 3 Click the track header for the WALLA 2 track to select that track.

You will see a semi-transparent version of the copied clip in the selected timeline.

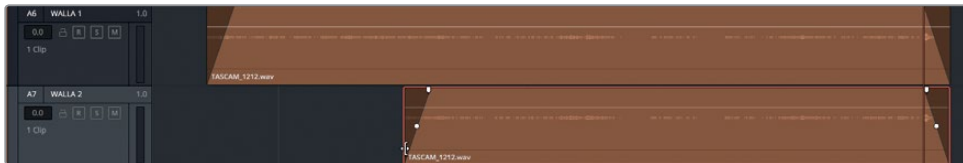


- 4 Choose Edit > Paste, or press Cmd-V (macOS) or Ctrl-V (Windows) to paste the copied clip into the new track.
- 5 Play the scene back to preview the changes.

So far, this still sounds like a small group of people murmuring and clinking glasses every now and then. When the two tracks play together, the only audible difference is an increase in the volume level.

To offset the clips, you could just drag the copy to the left or right. However, a more sophisticated way to offset clips is to find a recognizable sound in one and make sure that it isn't too close to the same sound in the other. In this case, you'll use the sound of clinking glasses to track the clip offset. Luckily, that sound also happens to be the highest level peak in the clip, so it is easy to locate.

- 6 Press the JKL keys to play the highest peak in the WALLA tracks. Then, place the playhead just before the peak.
- 7 Using the timeline ruler as a guide, trim the beginning of the duplicate clip to around 00:00:06:00.

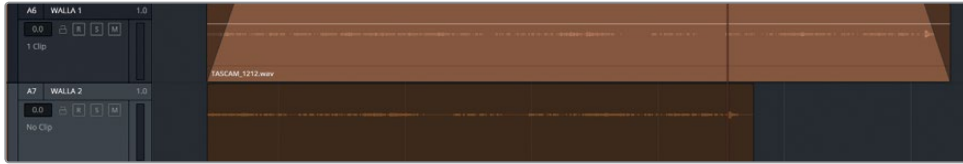


- 8 Select the clip on the WALLA 2 track, and press Cmd-X (macOS) or Ctrl-X (Windows) to cut the selected clip.



The clip's opacity lowers, just as it did with the copied clip; but this time, instead of creating a copy, you want to move the original.

- 9 Press the J key to move the transparent duplicate to the left until the beginning of the clip aligns with the beginning of the clip on the A6 track. Press Cmd-V (macOS) or Ctrl-V (Windows) to paste the clip.



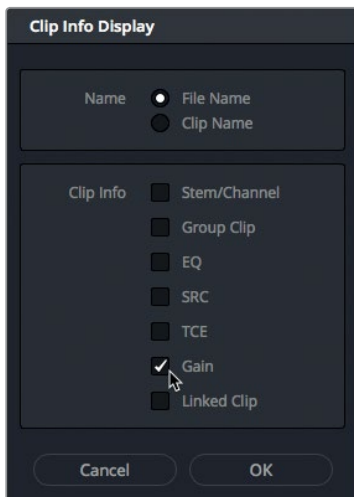
Notice that throughout the move, the playhead maintained its position on the selected clip. Don't worry about extending the duplicate clip because you'll be changing its speed shortly. You'll change its duration, as well.

TIP You can also simply pick the clip up and move it as you would in the Edit page.

- 10 Play the beginning of the WALLA tracks to hear how the offset clips suggest a larger number of guests in the room. Unsolo and then solo one of the WALLA tracks during playback to compare the sounds of one track with the offset-doubled tracks. When you are finished, unsolo the tracks.

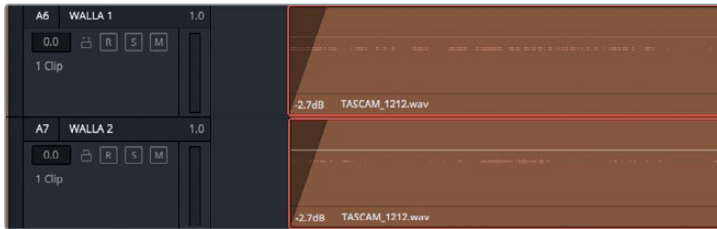
Of course, because audio levels are cumulative, the background tracks are now too loud. So, before moving on, this is a good time to lower the walla clips' playback levels.

- 11 Choose Fairlight > Clip Info Display, and in the Clip info Display box, select Volume. Click OK.



The current gain level for each clip appears at the head of each clip in the timeline.

- 12 Play the scene with the WALLA tracks, and lower their clip volume curves. Trust your ears and set them to suit yourself. If you aren't sure of a satisfactory level, set each clip to around -2.80 dB.



TIP You can also adjust the clip volume of the selected clip or clips in the Inspector.

You've just increased the number of party guests without hiring extras, reshooting a scene, or even recording audio with more guests. Best of all, you learned a cool audio trick for doubling tracks. Audio post-production often involves precisely moving a lot of clips, so those common keyboard shortcuts to cut, copy, move, and paste will be real-time savers.

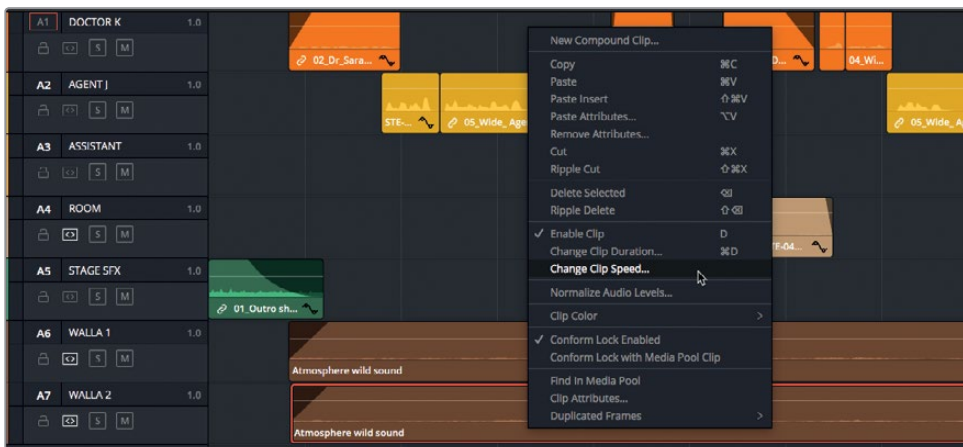
Applying Speed Changes to Audio

In this exercise, you'll apply the power of audio speed changes in the Edit page to enhance this scene. The three variables to consider are duration, pitch, and sync.

- 1 Go to the Edit page.

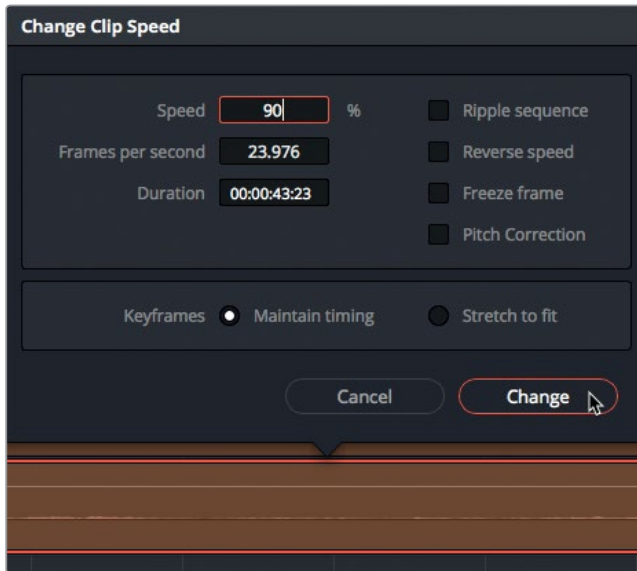
The first thing you should notice is that all the editing you've been doing in the Fairlight page has instantly updated in the Edit page because the two pages display exactly the same timeline, albeit in two different ways.

- 2 In the timeline, scroll down to the A7 WALLA 2 track, and select its audio clip. Right-click the selected clip, and choose Change Clip Speed.



The Change Clip Speed dialog appears with a Speed field for changing speed, as well as the Pitch Correction checkbox. Your goal is to lower the pitch of the walla clip to differentiate its sound from the first WALLA track. Doing so will enhance the fuller crowd sound that you created previously.

- 3 In the Change Clip Speed dialog, deselect the Pitch Correction checkbox which will produce a deeper, slower sound.
- 4 In the Speed Data field, type **90**. Click Change, or press Return.



You won't see a difference in the timeline, but you will hear it, eventually. First, let's trim the clip in the WALLA 2 track to match the length of the clip in the A6 track.

- 5 Drag the right edge of the clip to extend it. When you are finished, deselect the clip.



- 6 Solo the A6 and A7 tracks. Play them together, and then play each soloed to hear the difference in pitch between the original and the modified clips. When you are finished, unsolo both tracks.

As you can hear, speed changes are as useful in sound design as they are on your video tracks. Those walla tracks now really sound like a roomful of people.

Panning Tracks in Acoustic Space

Pan controls place a track's audio within a panoramic sound field. They enable you to compose the spatial arrangement of audio elements just as a cinematographer composes the visuals of a shot. Mono tracks can be precisely located to sound as if they come from an off-screen source, or somewhere within the frame. Resolve 15 includes advanced pan controls in both the Edit and Fairlight pages that support both 2D (stereo) and 3D (surround) audio placement.

In this exercise, you'll use the pan controls to widen the walla tracks so they don't "crowd" the dialogue tracks.

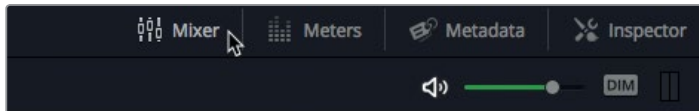
NOTE If you are working in a quiet room with a good set of stereo audio monitors, you should be good to go. If you have been using your built-in computer speakers or an inexpensive single speaker, you are well advised to use headphones for this panning exercise.

- 1 Return to the Fairlight page.
- 2 Start playback, and listen carefully. Can you pinpoint where the dialogue or walla is coming from?

Your eyes tell you their locations; but when you close your eyes, the sound from all of these tracks are playing equally from both speakers, which makes them sound centered within the sound environment.

Let's pan the walla tracks to the far left and right to hear what happens.

- 3 Click the Mixer button.



- 4 Using the Mixer's Pan controls, drag the blue handle for the A6 WALLA to the upper-left corner of the panning control in the control strip. Drag the A7 WALLA 2 blue panning handle to the upper-right corner of the control on the A7 channel strip.

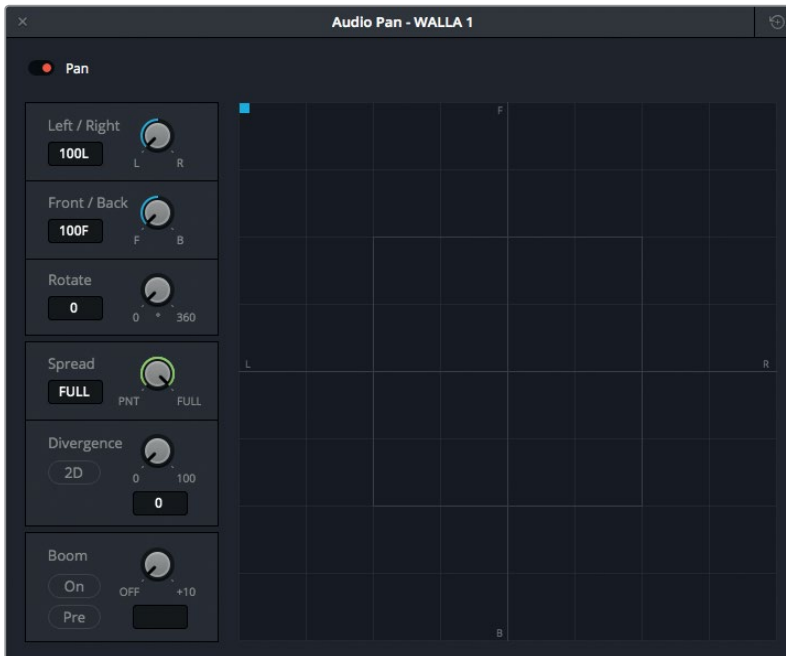


- 5 Play the timeline from the beginning to hear the walla tracks panned to the far left and right of the acoustic space.

Can you hear the change? In just a matter of seconds, you filled the far reaches of the acoustic space with the walla sound, making the crowd seem to spread out within a much larger room. Additionally, you moved their sound away from the actors' audio tracks, thereby making it easier to hear the all-important dialogue.

Let's take a closer look at the Pan controls.

- 6 In the Mixer, in the A6 track, double-click the Pan controls to open the Audio Pan window.



The Pan controls can work with either 2D (stereo) or 3D (surround) panning depending on your setup and project. The center of the graph represents the acoustic center from the audience's perspective. The small letters F, R, B, and L—positioned clockwise around the space in the top, right, bottom, and left positions—represent the Front, Right, Back, and Left positions in the panoramic field, respectively.

Where you place audio tracks within the panoramic space will reflect where the audience will locate each audio source. The Spread control is for linked sources. Divergence determines the spread of the audio signal to additional speakers in a surround mix, and Boom determines how much of a track's sound is sent to the low-frequency effect (LFE) speaker.

Look carefully to see that the A6 WALLA track is currently panned to the front-left position. Let's relocate it to the back-left position to hear the difference.

NOTE You may or may not hear the sound change from front to back when you are listening through stereo speakers or headphones. Also, if you are monitoring audio through an audio interface and mixer that outputs only left and right channels, then you may not hear any output that is not panned to the front left, front center, or front right.

- 7 Unsolo all the tracks, except for the A6 WALLA track.
- 8 Start playback, and drag the blue Pan handle to the lower-left corner of the pan area. Pan the track to the center, and then to the right. Return the control to the back left.

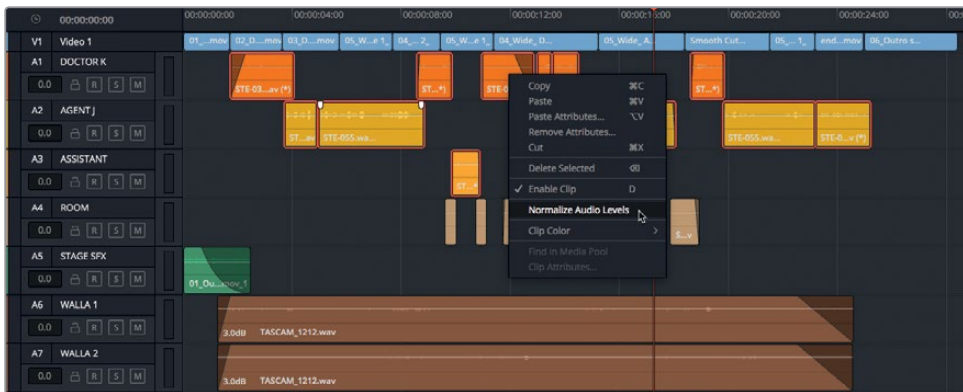
Could you hear the crowd move around the room as you panned? As the sound designer and re-recording mixer for this scene, you can choose where to place the crowd.
- 9 Use the Pan controls in the A6 and A7 tracks to place the walla tracks wherever you'd like in the panoramic field. If you aren't sure of their placements, try putting them in the far-left and far-right between the back and center locations.

When you are finished panning tracks to compose the acoustic space within your scene, you can move on to finessing the levels of those tracks. In audio post-production, volume control is an ongoing process right up until you output the final mix.

Normalizing Clip Levels

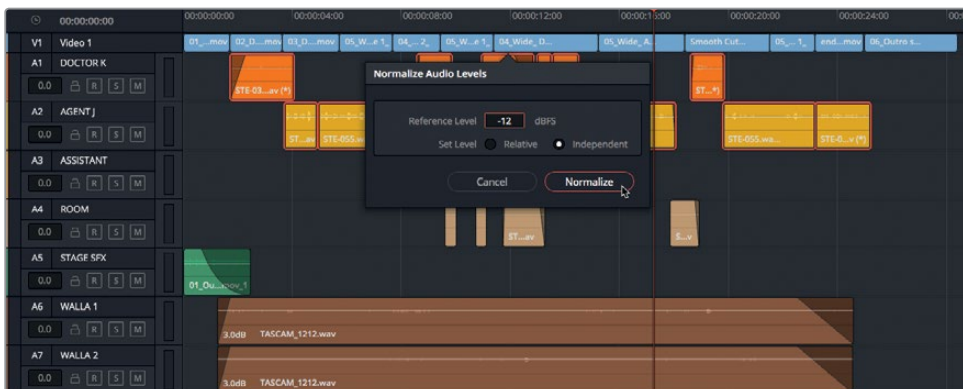
Ensuring that your dialogue levels are consistent is one of the main issues you'll be facing, whether you are responsible for a dialogue scene such as this, or a timeline with interviews, voiceover, or any kind of speech. Thankfully, DaVinci Resolve can help out, so you can spend time finessing your levels in other ways.

- 1 In the Media pool, select the Timelines bin, and double-click the 02 LEVELS timeline to open it.
- 2 Play through this timeline and listen carefully to the dialogue.
The dialogue is generally clear throughout, but you do need to sort out some of the levels.
- 3 Select all the clips along the three dialogue tracks: A1, A2, and A3.
- 4 Right-click any of the selected clips, and choose Normalize Audio Levels.



The Normalize Audio Levels box appears asking you to set a peak level and how you want to apply normalization across the selected clips.

- 5 Set the Reference Level to -12 dbFS and the Set Level option to Independent.

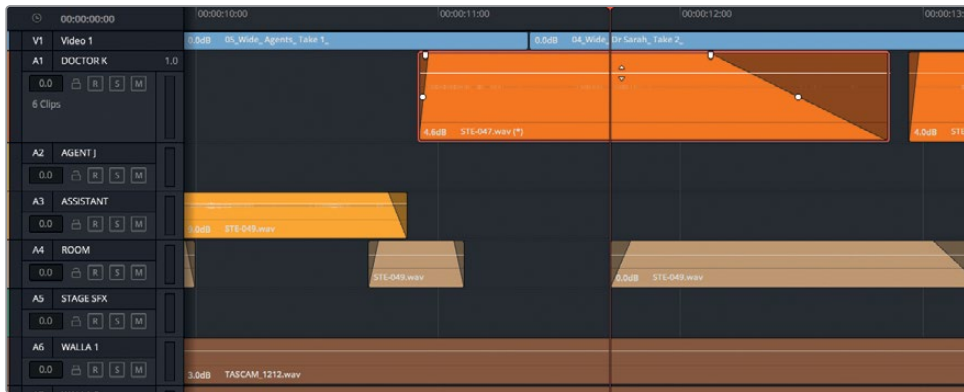


NOTE -12 dbFS is a good starting level for these clips. The level that you will choose to normalize your peaks may differ depending on your audio delivery requirements. By changing the Set Level to Independent, you are letting Resolve normalize the levels of each clip relative to its individual peak, rather than normalizing the clips by the same amount based on the highest peak level.

- 6 Play through the timeline to listen to the change.

The level of each clip is now adjusted to the highest peak reached, -12dbFS. But the Doctor's third clip level is now a little high.

- 7 Using the volume curve, lower the level of the third clip on the DOCTOR track to around 4 db.



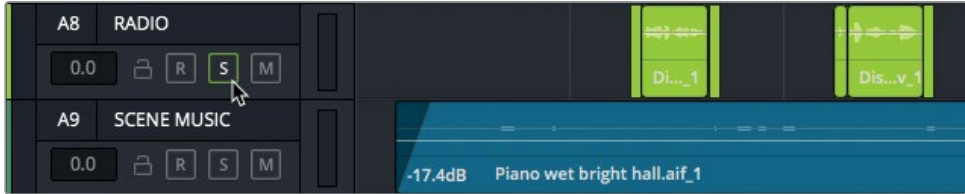
Working with Clip Equalization

Equalization (EQ) manipulates specific frequencies to enhance the overall sound. The primary function of equalization is to lower frequencies that detract from dialogue and boost certain frequencies to improve the overall sound clarity. The Fairlight page includes a four-band equalizer for each clip in the Inspector, and a six-band parametric equalizer on each track in the Mixer.

Creating a Two-way Radio Effect with EQ

To better understand the power of frequency equalization, let's use it in an extreme context to transform a recording so it sounds more like a two-way radio. You will systematically eliminate frequencies in the clip to emulate the limited frequency response of a CB radio. Along the way, you'll also alter various voice frequencies to determine which ones enhance and detract from this recorded voice.

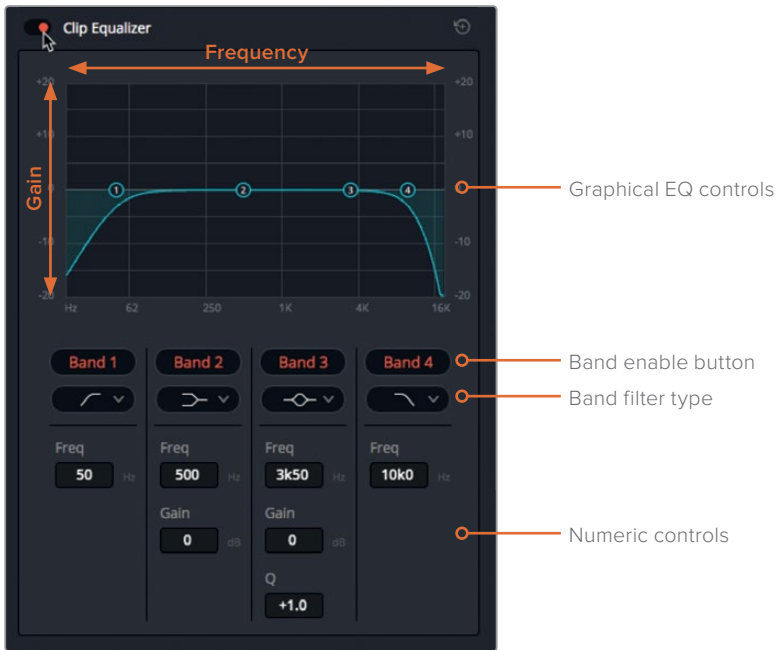
- 1 In the Media pool, in the Timelines bin, open the 03 EQ AND COMPRESSION timeline. This is a version of your scene with a couple extra tracks of ambience added.
- 2 Solo the A8 RADIO track and play the clips in the timeline.



As is, the voice sounds normal. Let's take a closer look at the radio dispatcher clips in the Inspector, focusing on the second and fifth clips that contain the actual voice, not the bookend radio clicking sounds on either side.

- 3 Zoom horizontally until you can clearly see both clips in the A8 track.
- 4 In the toolbar, click the Inspector button.
- 5 Select the second clip in the A8 track to see it in the Inspector.
- 6 Click the enable button to turn on the Clip Equalizer.

Before making any changes, take a quick look at the controls.



In the graphical EQ controls area, you can see and manipulate the frequency graph. The numerical controls at the bottom of the equalizer give you more precise control over the frequencies and gain of each band.

Looking more closely at the blue graph, you can see that the default setting resembles a clip with fade handles applied to the head and tail. The steep slope at the left edge of the curve is actually a high-pass filter that allows high frequencies to be heard while it eliminates the lowest frequencies. The slope on the right side of the curve is a low-pass filter that allows lower frequencies to be heard while eliminating the highest frequencies. In the next exercise, you'll work with both the high- and low-pass filters to alter the recorded voice in the clip.

Common Frequencies for Dialogue EQ

Audio frequencies are measured in either Hertz (Hz) or thousands of Hertz, or *kilohertz* (kHz).

Low numbers represent low frequencies and high numbers represent high frequencies.

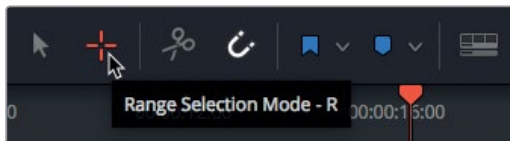
When you change the amount of gain in a frequency range, you either **boost** (increase) or **attenuate** (reduce) the volume level of the frequencies within that range. Filtering out a specific frequency or a narrow range of frequencies is referred to as *cutting*.

The audible frequency range for the average human is between 20 Hz and 20 kHz (or 20,000 Hz).

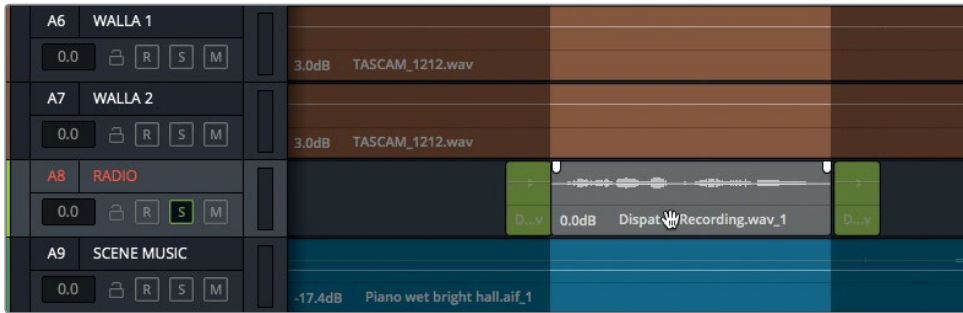
Sweeping Frequencies to Target Changes

Dragging the graphical controls left or right through the EQ graph during playback is referred to as sweeping and is the most effective way to hear changes and identify areas that need work. For this exercise, you'll sweep a midrange frequency bell curve in Band 3 to boost or attenuate frequencies during playback and isolate the talent's voice. Then, you'll adjust the high- and low-pass filters in Bands 1 and 4 to observe how these filters change the clip's audio. Let's start by turning off all the bands except for Band 3. Then, you'll sweep the bell curve to evaluate the radio dispatcher's recorded voice.

- 1 In the transport controls, turn on loop playback, and press R to choose the range selection tool.



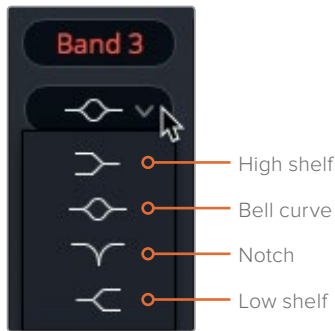
- 2 Using the range selection tool, select the second clip in the A8 track. Click the clip a second time to show it in the Inspector.



- 3 In the Clip Equalizer controls in the Inspector, click the red-colored band enable buttons for Bands 1, 2, and 4 to turn them off. This enables you to focus your attention on Band 3.



- 4 Click the band filter type pop-up menu below the Band 3 button to see the types of frequency filters available for Bands 2 and 3.



High and low-shelf filters are similar to high- and low-pass filters, but the shelf filters attenuate (lower) unwanted frequencies, whereas the pass filters completely block unwanted frequencies. You can apply bell curves to boost or attenuate frequencies anywhere on the graph and their range of influence can be narrowed or widened as needed using the Q control. A notch filter is used for completely removing, or cutting, specific frequencies.

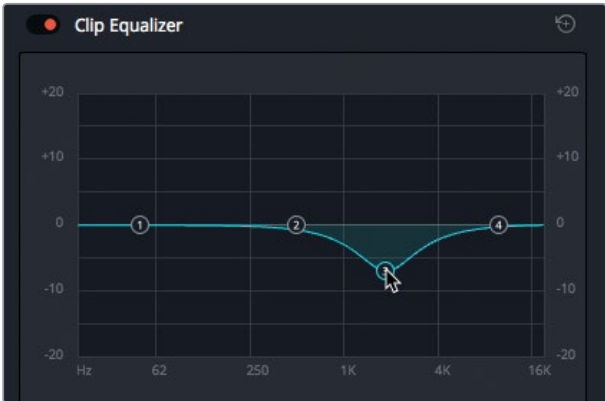
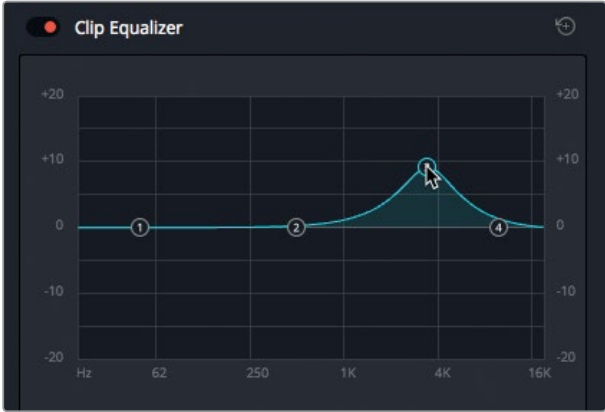
TIP A common rule of thumb when adjusting dialogue EQ is to cut narrow and boost wide. Also, a little EQ goes a long way, so make subtle changes, just as you would when refining an edit, or adjusting hue on the Color wheels.

Basic frequency ranges for the human voice

Men	80–160 Hz	Bass	50–250 Hz
Women	165–255 Hz	Mid-Range	250–2300 Hz
Children	250–300 Hz	High	2500–20,000 Hz

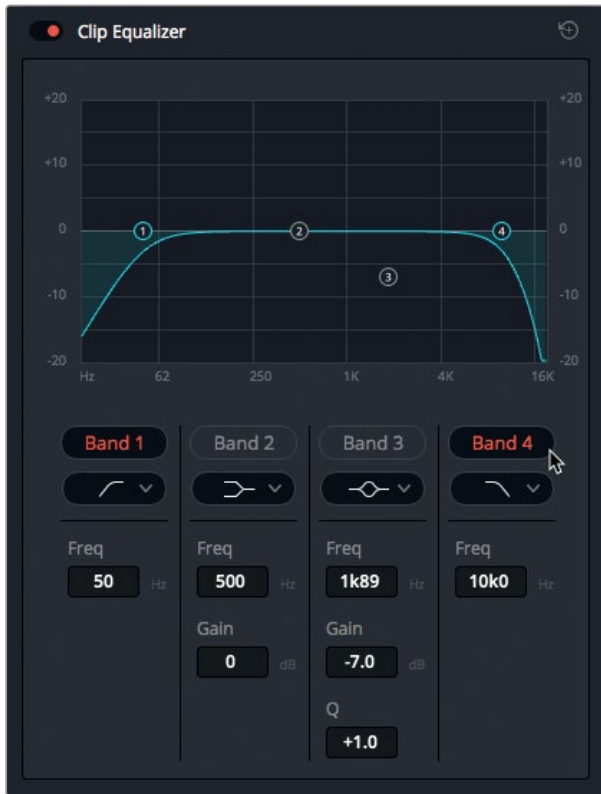
Human female voices tend to fall between 165 Hz and 255 Hz. As you sweep the frequency graph, this is a good chance to find the fundamental frequencies for this particular voice. You can sweep the Band 3 bell curve by dragging its corresponding numbered handle on the graph. If you drag the bell curve up, you will boost the current frequencies, whereas dragging down will attenuate them.

- 5 Press Option-/ (slash) in MacOS or Alt-/ (slash) in Windows to start looped playback of the marked range.
- 6 During looped playback, drag the Band 3 bell curve handle up, and sweep left and right through the graph to hear the boosted frequencies. Then, drag the bell curve down, and sweep to hear how attenuating certain frequencies can affect the voice. When you are finished, press the spacebar to stop playback.



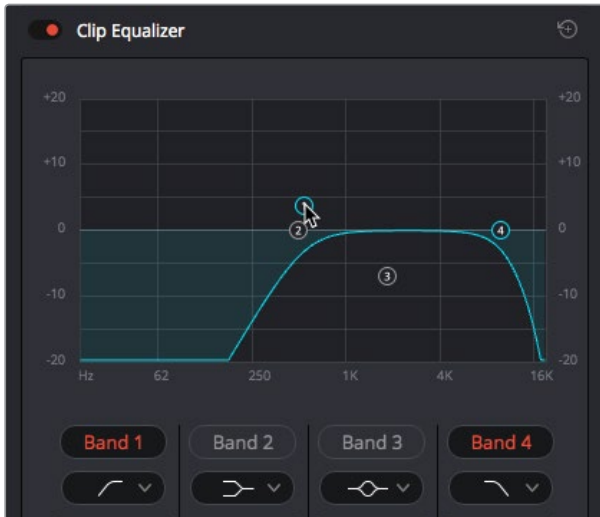
As you can hear, sweeping frequencies can really help you pinpoint the best and worst frequencies in a vocal. Because this exercise is focused on transforming the voice to sound as if it is coming from a two-way radio, you'll need to eliminate most of the high and low frequencies, and boost the remaining frequencies using the bell curve.

- 7 Click Band 3 to disable it, and click Bands 1 and 4.



You can sweep the high-pass filter (Band 1) by dragging its corresponding numbered handle on the graph. Keep in mind that this is a frequency filter that allows only those frequencies higher than the shaded part of the curve to pass through.

- 8 If necessary, press Option-/ (slash) in macOS or Alt-/ (slash) in Windows to restart looped playback.
- 9 During looped playback, drag the Band 1 EQ handle to the right on the graph, and listen to the change in the voice as you slowly eliminate the low and midrange frequencies. Sweep right as far as 4 kHz and sweep back to the left to around 550 Hz.



- 10 Continue with looped playback, and sweep the Band 4 EQ handle to the left as far as you can without lowering the curve in Band 1. Then, sweep back to the right to around 2 kHz. When you are finished, stop playback.



The last step is to use the Band 3 bell curve to sweep and boost the remaining frequencies between the Band 1 and 4 handles.

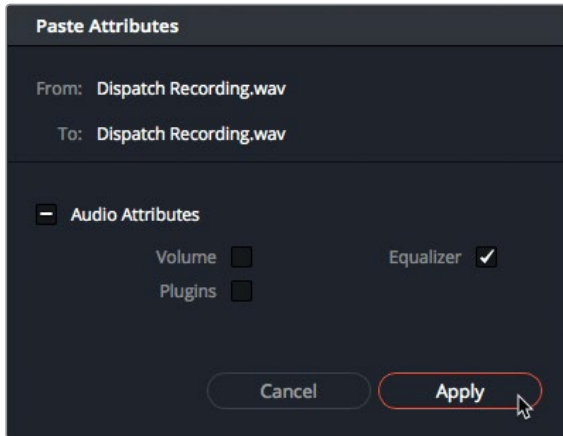
- 11 Enable Band 3, and start looped playback.
- 12 During playback, boost Band 3, and sweep back and forth to find the best sounding “radio” voice. When you are finished, stop playback.

There is no wrong choice here, so trust your ears. Any frequencies that you boost in the narrow frequency range that is available will successfully exaggerate the radio voice effect.



The last step is to listen to the clip with and without the EQ changes to compare the before and after results.

- 13 Start looped playback. Click the Clip Equalizer button to toggle EQ off and on to compare the original audio with the EQ version. When you are finished, stop playback.
- 14 Press A to go to Selection mode, and select the second clip in track A8, **RADIO**.
- 15 Press Cmd-C (macOS) or Ctrl-C (Windows) to copy the clip.
- 16 Right-click the fifth clip on the A8 RADIO track, and choose Paste Attributes, or press Option-V (macOS) or Alt-V (Windows).
- 17 In the Paste Attributes box, select EQ, and click Apply to paste the EQ settings.



18 Deselect the Solo button for track A8 RADIO.

Using the Equalizer, you've manipulated the frequencies to create that radio-voice effect. You'll apply some dynamics controls to the track shortly to complete the effect. First, however, let's apply some track EQ to improve the overall clarity of Agent Jenkins' voice.

Frequency level troubleshooting

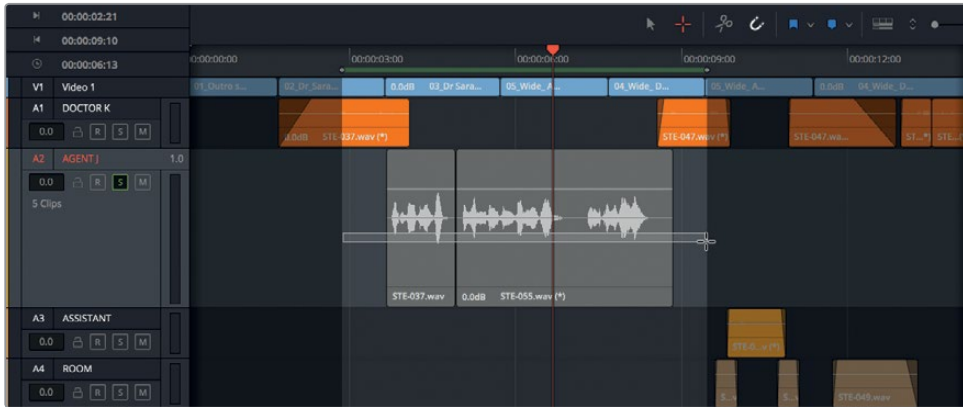
100 Hz - 300 Hz	Too low sounds thin, too high loses clarity
200 Hz - 500 Hz	Just right sounds warm, too high can sound boxy
250 Hz - 750 Hz	Potentially muddy if too high
600 Hz - 1.1 kHz	Potentially nasal/honky if too high
1 kHz - 3 kHz	Adjust for intelligibility
3 kHz - 6 kHz	Add presence
5 kHz - 8 kHz	Adjusts sibilance (esses)
9 kHz - 15 kHz	Adjusts sheen/sparkle
10 kHz - 20 kHz	Adjusts Breathiness/Airiness

Sweetening Dialogue with EQ

As you've just proven, sweeping frequencies and stripping out the high and low end of a voice is pretty easy. In contrast, actively listening, delicately cutting, and selectively boosting frequencies to improve a voice takes patience and practice. In this exercise, you'll apply three different bell curves to the AGENT J track to find and reduce detracting frequencies, and then selectively boost frequencies to enhance the voice.

TIP You should first find and cut, or attenuate, the detracting frequencies. Then boost the positive frequencies to sweeten the voice.

- 1 Press Shift-Z to fit all the clips horizontally in the visible timeline.
- 2 Solo the A2 AGENT J track. Then, using the range selection tool, drag across the first group of clips on the A2 track to select a range for looped playback.

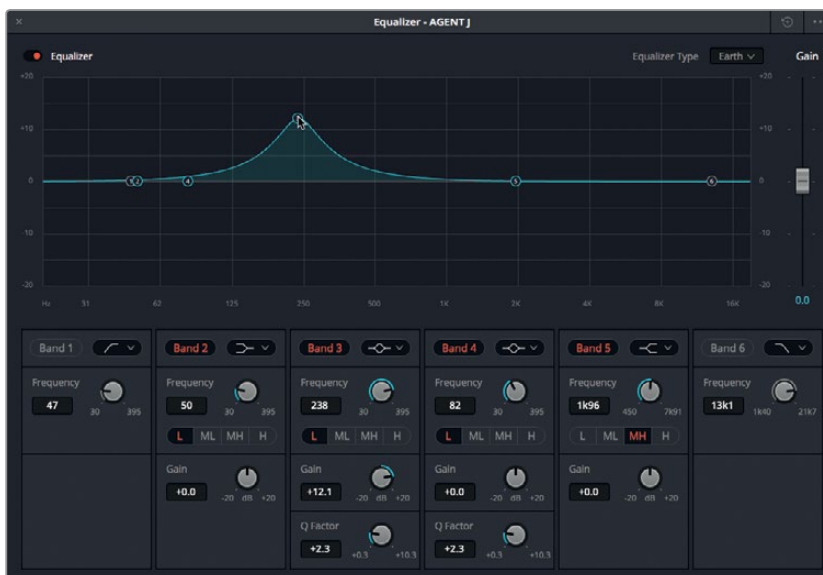


- 3 In the Mixer, double-click the EQ box for track A2 AGENT J to open the Track Equalizer window.



You can start sweeping for unwanted frequencies. The main issue with Agent Jenkins' voice is that it is a bit boomy or boxy sounding which can compromise its clarity, especially in the final mix with all the other tracks. His fundamental vocal frequencies fall between 80-160 Hz. The boxy frequencies are somewhere between 200-500 Hz. Let's start by sweeping the Band 3 bell curve in the mid/low range (ML) to identify the offending frequencies.

- 4 Start looped playback. Drag the Band 3 handle up to around +10 to +15 dB and sweep back and forth between 200-500 Hz. Listen carefully to the agent's voice as you sweep the frequencies. Notice which frequency range improves the voice and which amplifies its irritating qualities. When you are finished, stop playback.



Chances are you found that boosting the frequencies near 200 Hz improved his voice, while boosting around 450 Hz made his voice sound less pleasant, as if he were talking into a cardboard box.

TIP Training your ears to recognize subtle dialogue differences, both positive and negative, takes time, much the way colorists must train their eyes to see subtle nuances in flesh tones and shadows.

- 5 Restart looped playback, and drag the Band 3 bell curve handle to around 450 Hz. Then, drag it below the 0 dB line to attenuate the frequencies by about -3 dB.



Next, you'll sweep the Band 4 bell curve to find the sweet spot that enhances clarity. You've already noticed that the agent's voice improves with a boost around 200 Hz. Now you can pinpoint a more precise range that provides the most improvement and boost it by approximately 3 dB. One more thing, try improving his voice while the other tracks are playing.

- 6 Unsolo the A2 track. Start looped playback, if necessary. Sweep the Band 4 bell curve between 120-300 Hz. Identify the frequency range that most improves the clarity of his voice, and raise it slightly to boost these frequencies.



Trust your instincts and your ears. However, if you aren't sure, try using +3 dB at around 130 Hz.

The last adjustment to the agent's voice is to boost its intelligibility between 1-3 kHz.

- 7 Change the Band 5 filter type to a bell curve. Drag the Band 5 bell curve up to see the shape of the curve.



The default curve is too wide for this change. You can narrow the frequency range with the Q Factor controls.

- 8 At the bottom of the Band 5 controls, drag the Q Factor control to the right until the frequency range (curve) resembles the +2.3 curve in Bands 3 and 4.
- 9 Start playback, and sweep between 1-3kHz. Identify which frequencies improve the intelligibility of his voice, and boost the frequencies between 1-3 dB.



- 10 Continue looped playback, and toggle the Equalizer button off and on a few times to hear the agent's voice with and without the EQ. When you are finished, stop playback.
- 11 Close the Equalizer - AGENT J window, and deselect the clips in the A2 track.

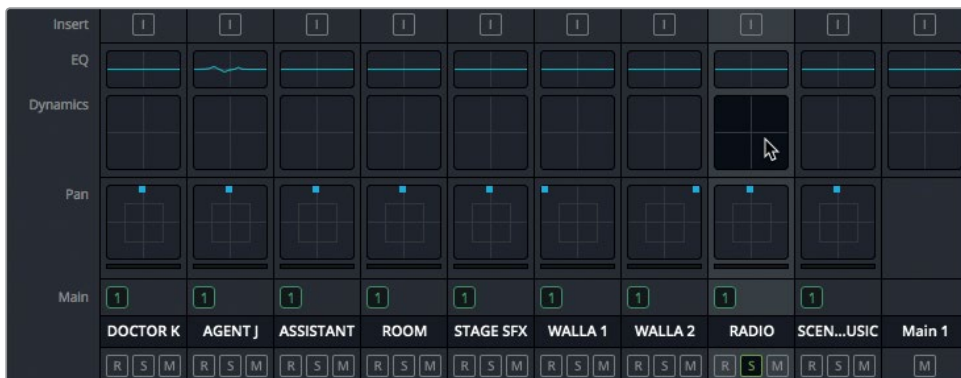
Though subtle, the improvement to Agent J's voice EQ is significant. This is another reason to separate each character on their own track during dialogue editing so that you can not only balance their volume levels, but also apply equalization to the entire track, as needed.

Controlling Dynamic Range

The difference between the loudest and quietest levels in a track is its *dynamic range*. A track's dynamic range is very similar to contrast within a shot. A track with a high dynamic range has very loud and quiet elements within the track, such as a character whispering and then screaming in the same scene. A low dynamic range is fairly flat, such as in a commercial voiceover in which the volume level of the talent is very even from start to finish. If you have ever worked with a waveform or Parade scope in the Color page, controlling a track's dynamics is very similar to adjusting the white and black levels of a clip. Just think of white as the loudest and black as the quietest.

The Fairlight page Mixer includes the four most common dynamics controls in one easy-to-use panel.

- 1 Solo the A8 Radio track, and with the range selection tool, select the second clip in the track to mark your looped playback range.
- 2 In the Mixer, on the A8 Channel strip, double-click the Dynamics area to open the Dynamics window.



The Fairlight page Dynamics controls include four tools for modifying a track's dynamic range.



The *compressor* is the most common control and is used to narrow the dynamic range by lowering the highest peaks and bringing them closer to the lowest peaks. It's a great tool for bringing out some of the quieter spoken words, while simultaneously lowering the level of the loudest words.

The *expander*, in contrast, enlarges the dynamic range to increase the difference between the loudest and quietest peaks.

The *limiter* and gate both work as acoustic “barriers” to limit sound from exceeding a target level (limiter), and to prevent sounds lower than a set threshold from being heard (gate).

In this exercise, you'll apply heavy compression and boost the overall gain in the Radio track to further emulate the radio sound. Adjusting the frequencies was just the first step. Compressing the dynamic range will further modify the radio voice to emulate the under-the-hood vocal processing in two-way radios.

TIP Many devices, including smart phones, intercom systems, and two-way radios use heavy compression to limit the dynamic range so that each spoken word can be heard. Obviously, the results don't follow natural volume fluctuations in vocal patterns but are a convenient enhancement to the voice amplification process.

- 3 In the Dynamics - RADIO window, click the Compressor button to enable the Compressor controls.



The default Compressor settings include a Threshold of -15 dB and a Ratio of 2.0:1. The Threshold indicates where in the dynamic range you want to start compression. So, in this example, any peaks over a Threshold value of -15 dB will be compressed by a 2:1 Ratio, which means that with every two decibels increase over -15 dB, only a one decibel increase will be permitted. When a track has a wide dynamic range, you can apply a higher Ratio value such as 5:1 so that for every five decibels of level increase over -15 dB only a 1 dB increase will be permitted. The heavier the compression, the more likely you will start to hear it in the quality of the sound. However, because you're emulating a low-quality radio speaker in this scene, the more compression, the merrier.

- 4 Start looped playback. In the Dynamics window or the A8 channel strip in the Mixer, watch the Output meter, to see the average volume level of the soloed range. The current average volume is around -23 dB, which is lower than the current Threshold.
- 5 Drag the Threshold knob to the left to lower it to around -24 dB. Then, drag the Ratio knob to the right to raise it to an 8.0:1 ratio. Listen to the change as you apply the compression.



With this much compression applied at -24 dB, notice that the graph of the upper end of the decibel curve (light green) is nearly horizontal, as are the peaks.

Let's boost the gain to more clearly hear the heavy compression. The Make Up gain fader lets you raise the overall level sound coming from the track's compressor. You can still adjust the track's overall output level independently using the track fader in the Mixer.

- 6 Drag the Make up gain fader up to around +10 to raise the output level of the track to -12 dB.



Now you can really hear the compression in the track. Don't worry, you'll be able to lower the level of the Radio track in the Mixer and still maintain the distorted, over-compressed effect.

- 7 Toggle the Compressor button off and on to compare the voice with and without the compression applied. When you are finished, close the Dynamics window, unsolo the A8 RADIO track, and deselect the clip.
- 8 Play the timeline to hear the finished radio effect with the other tracks.

Another successful exercise in acoustic manipulation. Although this is an extreme example of compression and EQ, it should pave your way to experiment with these controls in your own projects. You can start by applying a small amount of compression to the Doctor's and Agent Jenkins' dialogue tracks to help give them a little more punch in the mix.

Automating Track Changes

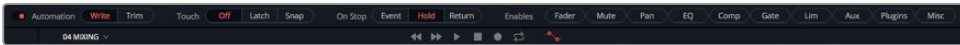
Adjusting faders, panning, and other controls during a mix is part of your job. You could try making all of the changes on-the-fly during your final mix, or alternatively record the parameter changes as automation. In this exercise, you'll use DaVinci Resolve's automation controls on the Fairlight page to record panning control changes over time.

At the top of the Fairlight page, you'll find the automation button to the right of the transport controls.

- 1 In the Media pool's Timelines bin, open the 04 MIXING timeline.
- 2 Click the automation button to open the Automation toolbar.



The Automation toolbar includes buttons for every available option to set up and record automation for your mix. The buttons are organized in groups from left to right.



You can record automation data in Write or Trim modes. Write mode records absolute changes to controls, whereas Trim mode records relative changes that either increase or decrease levels that are already recorded.

The other important settings for automation include:

- Touch determines what will happen when you begin automation. If the touch mode is turned off, no automation is recorded.
- Latch begins recording as soon as you touch a control that is set for automation and continues to record automation after you release the control.
- Snap begins recording automation when you touch a control and stops when you release the control.

Your goal in this exercise is to start with the radio track panned left and then automate panning to the right after the doctor's first look so the second radio call sounds as if it is coming from a radio on Agent Jenkins. Use the doctor's eyeline in her second look as a guide.

TIP Before recording automation, it's always a good idea to practice recording at least once.

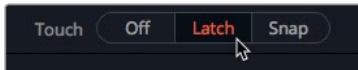
- 3 Make sure that the Touch automation menu is set to Off.

TIP When you are working with automation, it's a good idea to set the Touch mode to Off any time that you aren't actively recording. Otherwise, you could accidentally record or overwrite automation during playback. Also, you can click the Automation button to the left of the Automation toolbar to disable or enable all automation that is applied to a timeline.

- 4 In the Automation toolbar, click the Pan button.



- 5 In the A8 RADIO channel strip, double-click the Pan controls to open the Audio Pan window.
- 6 Start playback, and practice the panning maneuver once.
- 7 When you are ready to record, set the initial pan to be on the left speaker.
- 8 In the Touch pop-up menu, choose Latch.



- 9 Click play, and record the panning automation. When you are finished, set the Touch menu to Off.

TIP Automating pan controls on your mono FX tracks is a great way to track sounds to objects that move in the frame.

- 10 In the Automation toolbar, click the Pan button to deselect pan automation. Close the Audio Pan window.
- 11 Playback the timeline to hear the automation.

As the timeline plays back over the automation, you should hear the pan change and also see the pan control update on its own accord.

Adjusting Recorded Automation Changes

After you have recorded automation for a particular control, you can view the automation graph directly in the timeline track.

- 1 In the track header for Track A8 RADIO, right-click, and choose Lock Track Height To > Large, or manually resize the track.

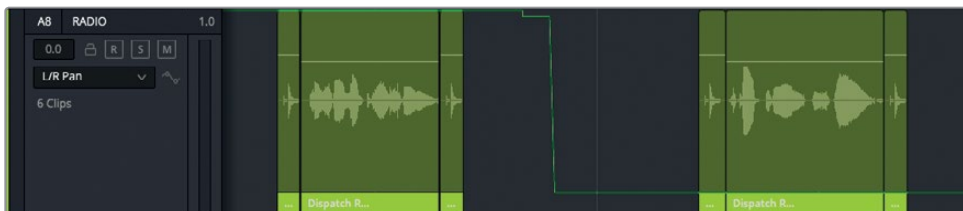


So long as your automation controls are visible, an additional set of controls appear in the header of each track.

- 2 Click the pop-up menu, and choose L/R Pan.

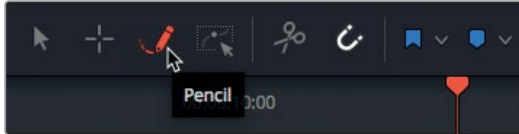


The track updates to display the pan changes you recorded in the previous exercise.

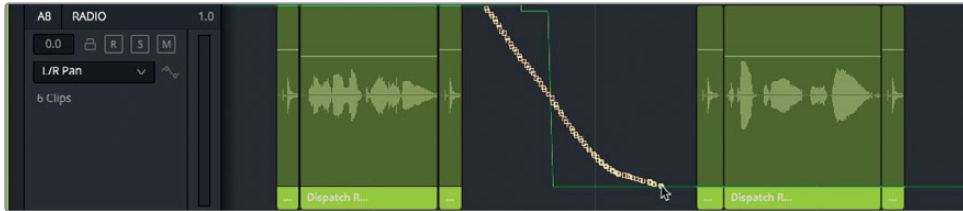


If you want to adjust this recorded automation data, you have a couple of options. First, you could try re-recording the change. Place the playhead before the automation starts and play the timeline while adjusting the controls, as necessary. Alternatively, you could use the Pencil tool to redraw the automation graph.

- 3 Select the pencil tool.



- 4 Position the pencil tool to the left of the automation data you want to adjust.
- 5 Drag the pencil tool across the automation data to redraw the graph.



TIP To adjust a group of automation keyframes simultaneously, use the Select Range tool to the right of the Pencil tool. Drag out a range across a group of automation keyframes, and then move them horizontally and/or vertically within the automation graph, or press the Delete (backspace) key to remove them.

When you are working on a slower computer or laptop, automation may affect the quality of video playback. To streamline your workflow during the remaining exercises, you can temporarily disable automation by hiding the automation toolbar. Later, you can turn on automation for your final output.

NOTE The Pencil and Select Range tools are visible only when you the automation tools are active.

- 6 Click the automation button to hide the automation toolbar.

Now that you've had a taste of automating track controls, you can start applying automation to your own projects.

Simplifying Mixing using Buses

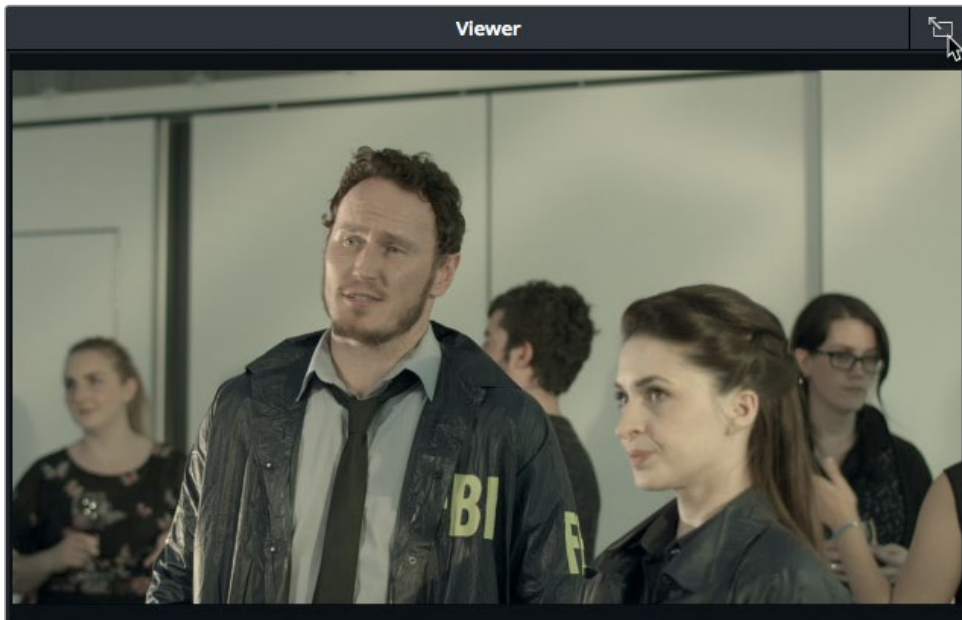
You already know how to balance individual clip levels; but if you have numerous similar tracks that have already been balanced, such as dialogue, atmosphere tracks, or music, you can combine them and send the output signal from each of the tracks through a bus to create a *submix*. As the name suggests, a submix lets you independently mix a subset of the tracks.

Submix buses are signal paths that send the signal from multiple tracks to a new channel strip where the sum of their signals can be controlled like a single track, in a similar way that you used compound clips in Lesson 6.

In this exercise, you'll create submix buses for the dialogue, music, and background FX tracks.

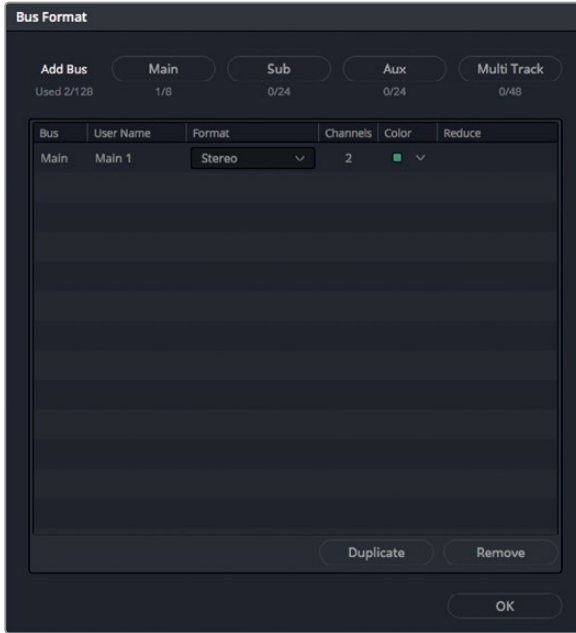
Once again, before you begin, let's reconfigure the Resolve interface to more effectively support your upcoming workflow.

- 1 In the Media pool's Timelines bin, open the 05 BUSSES AND MAINS timeline.
- 2 In the toolbar at the top of the Fairlight page, click the Meters button to show the monitoring panel.
- 3 In the upper-right corner of the viewer window, click the dock button to return the viewer to the monitoring panel.



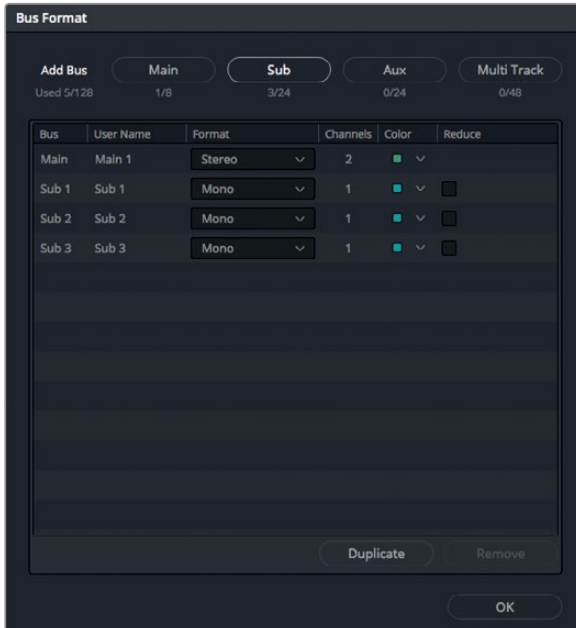
Now the viewer appears to the right of the monitoring panel once more.

- 4 In the Fairlight page, choose Fairlight > Bus Format to open the Bus Format window.



In the Bus Format window, you can assign tracks to one of four types of buses. The project currently contains one bus, the default main bus named Main 1. The Format and Channels columns indicate that this main bus is in stereo.

- 5 Click the Sub button three times to add three new submix buses to the list.

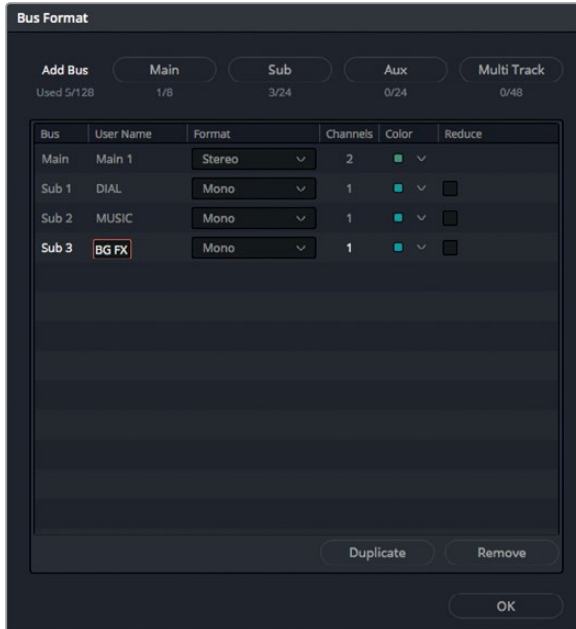


The three new sub buses (submixes) appear below Main 1 in the Bus Format pane.

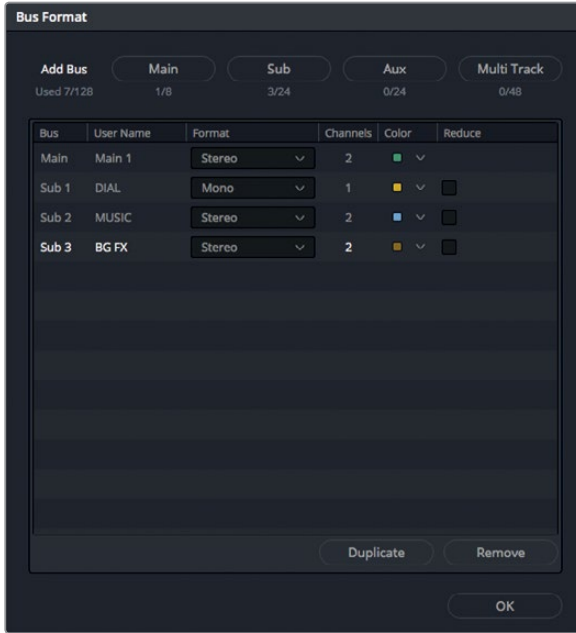
Notice that three sub buses—labeled S1, S2, and S3—are to the right of the Mixer, as well as on the monitoring panel.

Let's name the sub buses and change their formats and colors based on the tracks they will contain.

- 6 In the User Name column, double-click the Bus 1 name, and enter **DIAL**. Then change the name of Sub 2 to **MUSIC** and Sub 3 to **BG FX**.



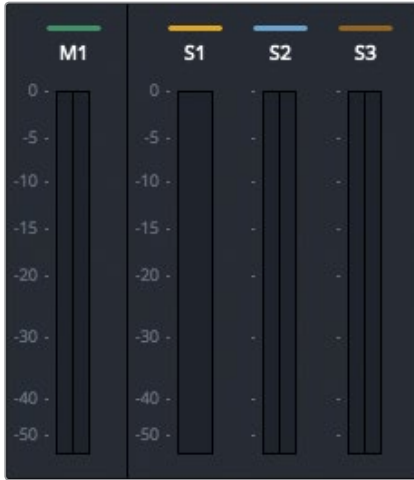
- 7 In the Format column, change the format of the MUSIC and BG FX subs to Stereo. Leave the DIAL sub set to Mono.
Finally, let's change the colors of each submix to correspond to the tracks in the timeline.
- 8 In the Color column, change the Sub 1 DIAL color pop-up menu to Yellow, the Sub 2 bus color to Navy, and the Sub 3 bus color to Chocolate.



- 9 Click OK to close the Bus Format window.

The new sub bus names and colors also appear in the Mixer and the Meters.



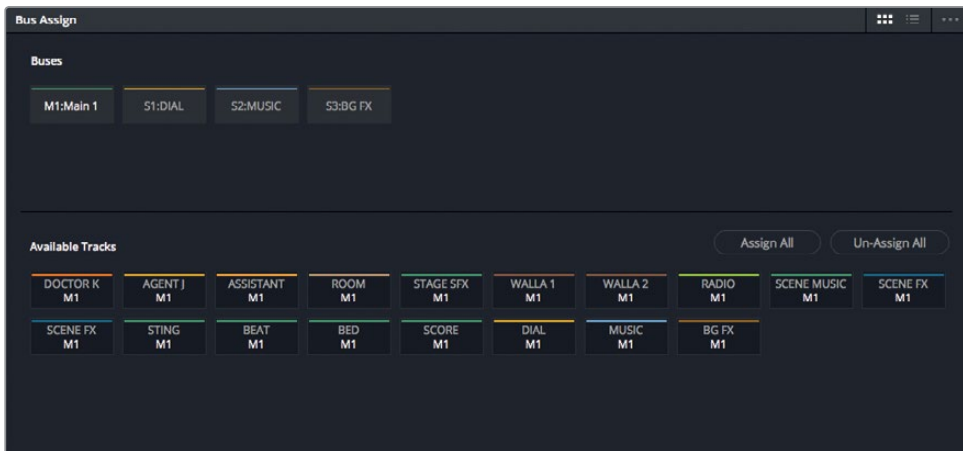


You are all set up with submixes. The next step is to route the appropriate tracks into those submixes.

Assigning Tracks to Submix Buses

You must now assign the tracks that you want to send to each bus.

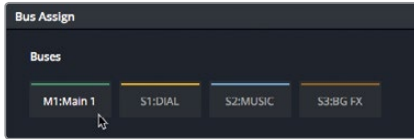
- 1 Choose Fairlight > Bus Assign to open the Bus Assign window.



The Bus Assign window has two sections. At the top of the window is a list of all the buses. The rest of the window shows the available tracks. In the Available Tracks area, initials under each track name indicate the current assignments for each track. Below each track name, you'll see an M1 to indicate that the track is assigned to the Main 1 output. Tracks with B1, B2, or B3 initials below the name are assigned to those corresponding buses (in this case, the DIAL, MUSIC and BG FX submixes respectively).

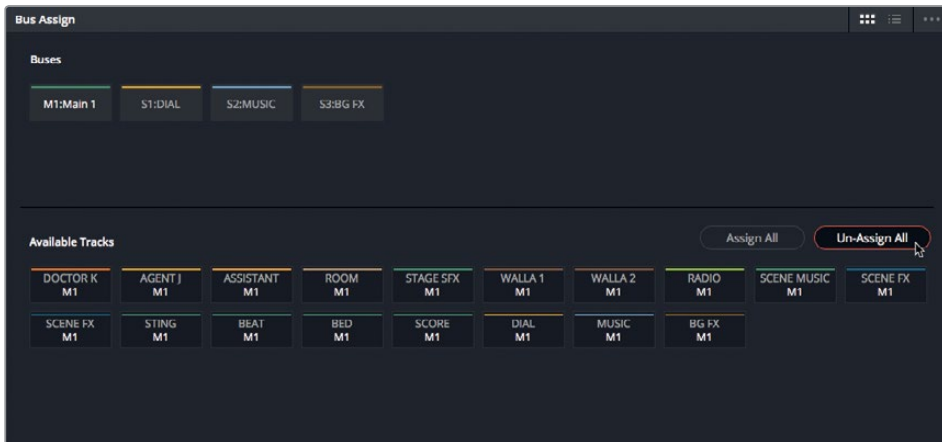
To better understand the bus and main architecture, let's clear all of the current track assignments and reassign them from scratch. To do so, you'll select each bus individually, and click the Un-Assign All button.

- 2 In the Buses area in the Bus Assign window, click the M1:Main 1 button.

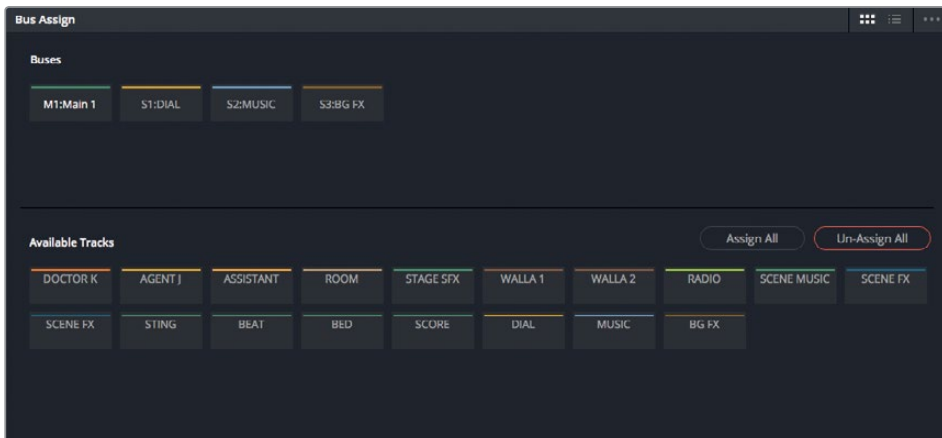


The name of the selected bus highlights to indicate it is selected.

- 3 In the Available Tracks area, click the Un-Assign All button.

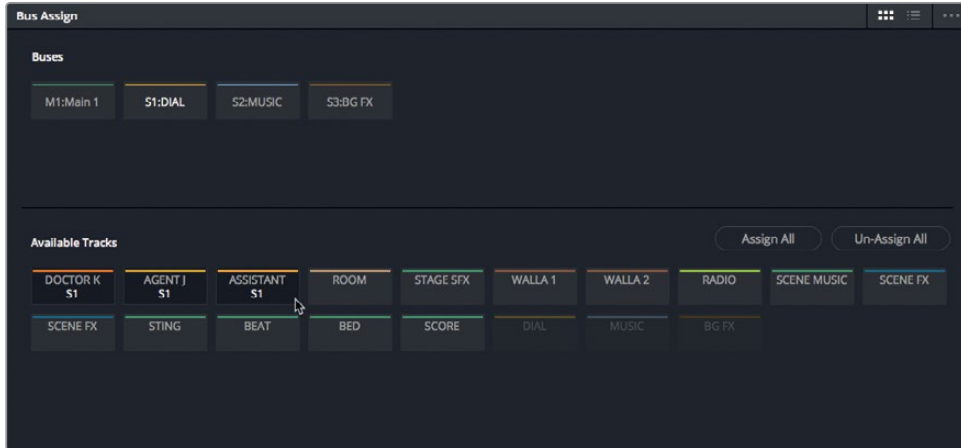


All of the tracks are removed from the M1:Main 1 output bus. Remember that only tracks assigned to a Main output are audible. So, you'll eventually need to reassign these tracks.



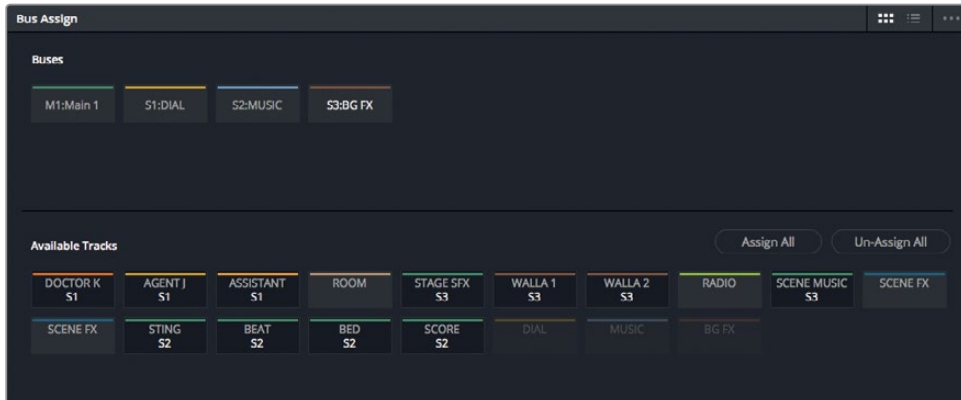
All the tracks and buses are successfully unassigned. Now you can manually select each bus and assign tracks to them.

- 4 In the Buses area, select the S1:DIAL bus. In the Available Tracks area, select the DOCTOR K, AGENT J, and ASSISTANT tracks as these are all the tracks containing dialogue.



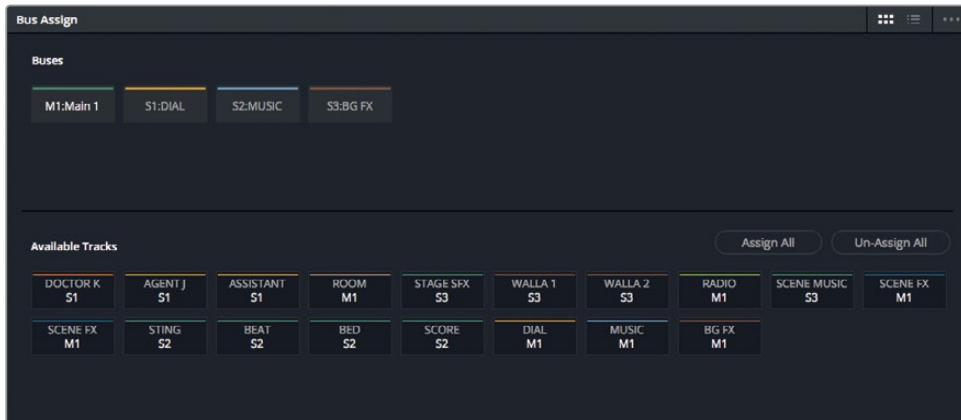
TIP The dispatch radio track includes recognizable words in spoken English, so like all other dialogue tracks, it would usually be omitted in a Music and Effects-only (M&E) mix intended for foreign distribution. However, in this case, the purpose of these submixes is to control the primary dialogue tracks. Similarly, for this scene, the source music is more a part of the background ambience than a musical score, so you'll assign it to the BG FX submix rather than the MUSIC submix. In this scene, the purpose of your submixes is primarily to finesse the levels between the dialogue, music, and background FX tracks in the second half of the scene.

- 5 Select the S2:MUSIC bus, and then select the STING, BEAT, BED, and SCORE tracks to assign them to that bus.
- 6 Select the B3:BG FX bus, and assign the STAGE FX, WALLA, WALLA 2, and SC MUSIC tracks to it.



Next, you'll assign the as-yet unassigned tracks to the M1:Main 1 output. They represent sounds that are heard for a short time and their tracks levels can be adjusted independently using the standard faders in the Mixer. You'll also need to assign each of the three submix buses to the M1:Main 1 bus so that the audio of those buses will be audible through the main output.

- 7 Select the M1:Main 1 bus, and assign each of the unassigned tracks to it, as well as the DIAL MUSIC and BG FX buses.

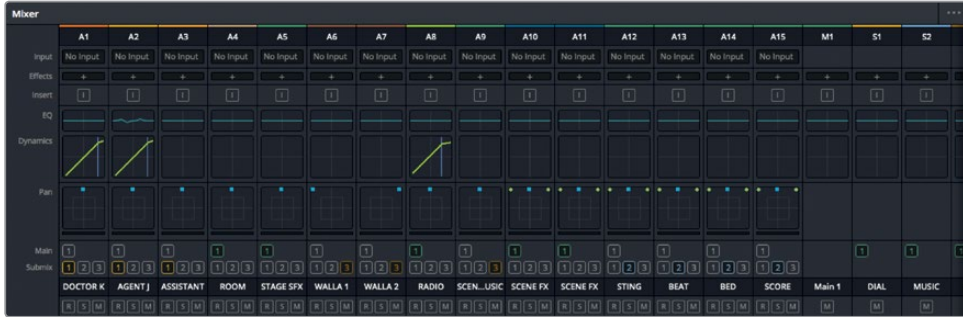


- 8 In the Bus Assign window, click the Save button.

All the tracks are assigned to the main output or a sub bus, so you can see and hear them in action in the Mixer.

Working with Buses in the Mixer

The middle section of the Mixer always shows your main and submix buses, and the current signal flow of each track so you know where it is assigned. In this exercise, you'll play through the timeline to verify that all your tracks and submixes are playing properly. Then you'll try out your new submix faders.



TIP You can expand or compact the Mixer at any time by dragging its left edge. The buses are always visible to the right of the Mixer.

- 1 Drag the left edge of the Mixer to the left to expand it, if necessary.
- 2 Press Shift-Z to fit all the timeline clips horizontally in the visible timeline.
- 3 Play the project from the beginning, and listen to the current mix.

The mix should still sound pretty good. You haven't actually changed any of the levels, just altered the way that you will control them. You can continue to balance clip level curves and individual faders as usual.

The background FX tracks seem a little distracting. Let's emphasize the dialogue by lowering some of the background sounds.

- 4 Start playback, watch the scene, and move the S3 fader down to where it sounds less distracting (about -5dB).

Now you know why submixes are a mixer's best friend. It is much easier to move one fader that lowers three tracks than to manually lower three separate faders on-the-fly.

TIP Re-recording mixers working with large mixing consoles are used to moving hardware faders during playback and can maneuver their hands around the controls like a musician playing a church organ. When you are working in a software-only environment, you must do the best you can using a mouse or track pad. You can always record automation to your tracks or submix buses to help simplify the final mix. Also, numerous hardware mixing consoles are compatible with DaVinci Resolve and its Fairlight page. You can find a list of compatible mixing hardware at www.blackmagicdesign.com.

Creating Additional Output Buses

Every audio signal in the timeline flows from the track to the main output. Whether you are listening to speakers or headphones at your workstation, you are hearing the main output every time you play your timeline.

The current timeline has one main output, three submix buses, and sixteen individual tracks. However, depending on the delivery requirements for your final project, you may need to create additional main output buses in multiple formats. In fact, most professional projects require several versions of your mix, such as for stereo and surround.

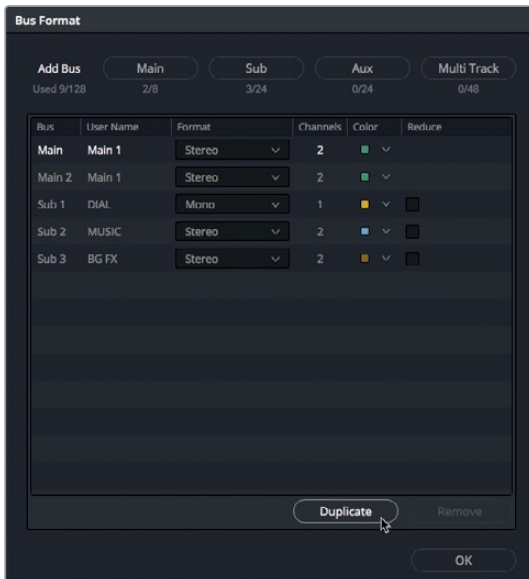
Furthermore, if dubbing a program into another language, you need to provide an M&E version of the mix that is devoid of all intelligible on-screen dialogue so that it can be replaced by actors speaking another language.

You can create and assign main buses just as you created submix buses in the Bus Format and Bus Assign windows.

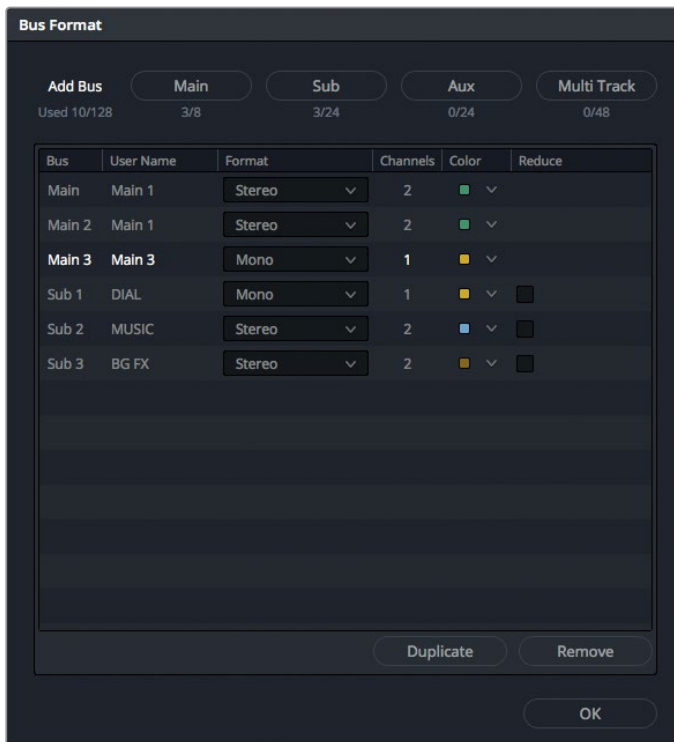
In this exercise, you'll create a three-channel DCP main output and an M&E main output based on the current mix. Since the M&E mix will be identical to the Main 1 mix without dialogue, you can simply duplicate the Main 1 with all tracks and subs identically patched then make any changes from there. As for the DCP main output, you'll create that one from scratch.

- 1 In the Fairlight page, choose Fairlight > Bus Format.
- 2 In the Bus Format window, select Main 1, and click the Duplicate button.

The duplicate main appears below Main 1 with the bus assignment of Main 2 and the username Main 2.



- 3 Click the Main button to create a new main output bus for the DCP main.



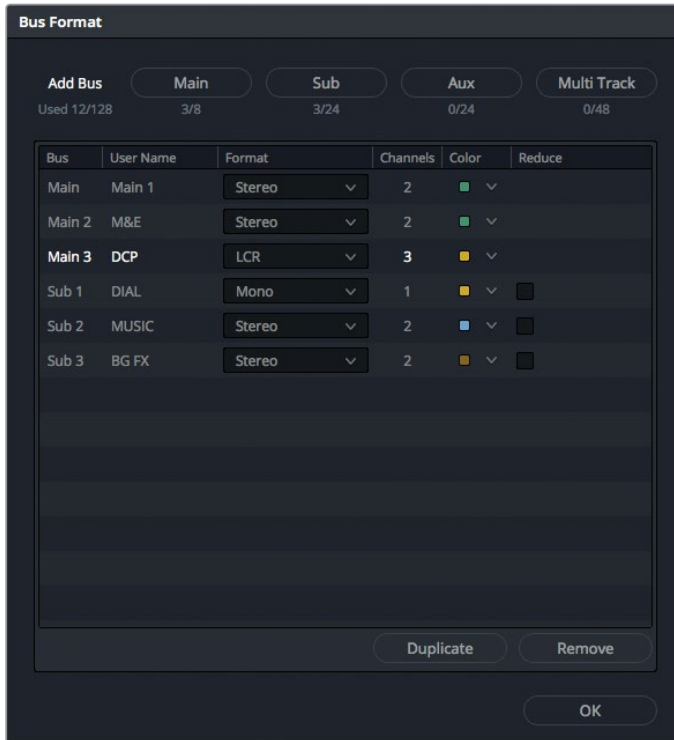
The two new mains (Main 2 and Main 3) appear below Main 1 in the Bus Format pane.

- 4 Name the Main 2 bus **M&E** and the Main 3 bus **DCP**.

Although the default setting for the Main 1 output format is stereo, you can change it to a different format at any time, or create multiple mains for each of your delivery formats. Digital Cinema Projection (DCP) delivery, for example, requires a minimum of three channels (LCR) or a maximum of 16 audio channels for multichannel surround sound.

Because you probably are not doing this lesson with a surround sound set up, let's use the minimum requirement of three channels and set them to LCR (Left, Center, Right). LCR is a common format, sometimes referred to as the "poor man's surround sound," in which all the tracks are mapped to three front speakers. In LCR mixing, the music and effects are mapped to the left and right channels and the dialogue is locked to the center channel. This is similar to multi-speaker surround sound formats because they also place dialogue in the center channel, but also include additional side or back speakers and a subwoofer for low frequency effects (LFE).

- 5 Change the Format of the DCP bus to LCR.



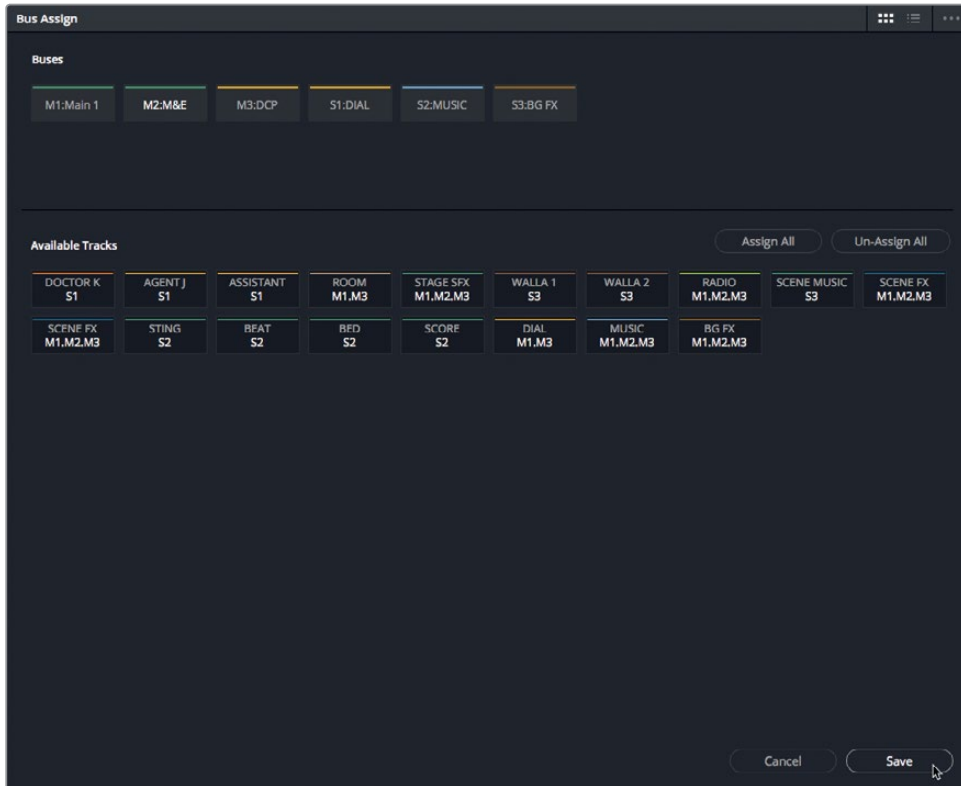
You now have three Main outputs to the right of the Mixer and on the monitoring panel –labeled M1, M2, and M3.

6 In the Bus Format window, click OK.

7 Choose Fairlight > Bus Assign.

Now you'll assign tracks to these main outputs. Let's start with the M3:DCP bus. Later, you can set up the M2 bus on your own.

8 In the Buses area of the Bus Assign window, select the M3:DCP bus. In the Available Tracks area, select the DIAL, MUSIC, and BG FX buses. Finally, select each of the tracks that are mapped directly to the M1 output to also route these to the M3 output: ROOM, APPLAUSE, RADIO, END FX, SC FX 1, and SC FX 2.



- 9 Click Save to save and close the Bus Assign window.

Excellent. Your new DCP output bus is set up.

Monitoring Multiple Outputs and Buses

The Control Room settings in the monitoring panel let you determine which outputs or submixes are audible during your mix. The default is always the Main 1 output. To monitor a different main output or bus, you choose from the pop-up menu below the control room meters.

Let's give it a try. In this exercise you will change the control room monitoring to the DCP output. Play the timeline once, then change it back to the Main output. Keep in mind, your control room monitoring can be changed anytime.

- 1 Below the Control Room meters, in the control room monitoring pop-up menu, choose DCP.



- 2 Play the timeline once to monitor the DCP main output.
- 3 Change the Control Room monitoring back to Main 1.

TIP It's a good idea to always reset the control room monitoring to the Main output when you are finished.

Assigning the Music and Effects Tracks

Now it's up to you to think through the M&E output to make sure all of the correct tracks or submixes are included.

For example, the dispatch radio sound includes spoken words. Because it is not part of the original script, and source is not even visible onscreen, the foreign language translators may choose to omit it altogether. You can include those scripted lines and reference audio for the distributors and let them decide.

Meanwhile, you need to make sure the spoken radio audio is not included in the M&E mix. The best way to do so is to create a duplicate submix for the BG FX that excludes the RADIO track.

Another consideration is the ROOM track. Technically, ROOM is part of your dialogue mix; and because all evidence of the dialogue and production sound must be removed for dubbing, ROOM should also be left out of the M&E mix.

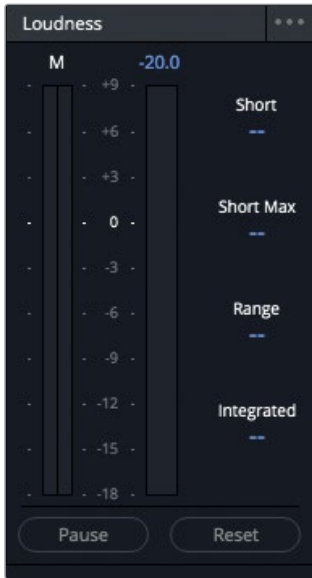
- 1 In the Bus Format window, duplicate the S3 BG FX submix.
- 2 Name the S4 BG FX submix, *S4 BG FX M&E*.
- 3 In the Bus Assign window, assign the WALLA and SC MUSIC tracks to the submix.
- 4 In the Bus Assign window, select the M2:M&E bus, and assign the appropriate submixes and tracks. Keep in mind that no spoken dialogue should be present in the M&E output bus.
- 5 Save the changes in the Bus Assign window.
- 6 Choose Control Room Monitoring > M&E, and play the timeline to hear the M&E output. The scene should sound great but have no trace of dialogue (including the radio).
- 7 If tracks are missing, or you hear dialogue in the M&E output, go back to the Bus Assign window, and make the necessary changes to the track assignments.
- 8 Change the Control Room monitoring back to Main 1, and save the project.

Monitoring Loudness in your Mix

Now that you are ready for final output, you need to monitor your output levels. In the past, broadcast standards were based on the highest peak level in a soundtrack. As long as audio content did not exceed that level, it would pass quality control. That led to commercials that applied heavy compression to narrow their dynamic range and bring all voiceovers to the maximum allowable (and overbearing) level.

To even the acoustic playing field, new loudness standards were introduced that apply to all broadcast programs (television and radio) regardless of the length or type of program. In North America and parts of Asia, an integrated target of -24 LUFS (Loudness Units Full Scale) is the norm for broadcast content, whereas in Europe the target is -23 LUFS. (Theatrical films, trailers, and streaming videos have different standards.)

Resolve includes two types of monitoring panel meters to measure such standards. Peak meters are traditional Root Mean Square (RMS) meters available for every track and bus that uses a decibel scale, and Loudness meters measure the loudness in your program based on the loudness unit scale (LUFS).



You can use the Loudness meters to measure the perceived loudness over the entirety of your program to verify that the levels of your final mix meet the current loudness standard, ITU BS.1770.

The Fairlight page Loudness meters include a numeric display that outputs a variety of useful loudness measurements with the most important being the Integrated level.



- M displays the momentary loudness unit at the playhead location.
- The loudness units meter displays the sum of all channels for the duration of playback. The numeric value at the top is the max LU value over that range.
- Short displays loudness over a 30-second range.
- Short Max displays the played range's maximum true peak level.
- Range displays the dynamic range of loudness in the entire program.
- Integrated displays the average loudness for the entire played range. This is the value that targets either -23 LUFS or -24 LUFS as required by broadcasters and is configured in your Project settings.

In this exercise, you'll monitor the integrated loudness display to ensure it comes within +/- 0.5 of the target -23 LUFS.

- 1 At the bottom of the Loudness meters, click the Reset button to clear all current measurements.
- 2 Move the playhead to the beginning of the scene.
- 3 Under the Loudness meters, click the Start button to enable the analysis.
- 4 Press the spacebar to play the timeline. Watch the integrated loudness display during playback to see how close to 0 on the loudness scale (-23 LUFS) your program measures.

The Loudness meter is a solid blue color that measures from -18 to +9, unlike decibel meters that show from -50 dbFS to 0 dbFS across their green, yellow, and red ranges. The Loudness meter is designed in this manner because -23 LUFS is equal to 0 on the Loudness meter scale. When you monitor levels with a Loudness meter, your goal is to keep the level near to 0.

TIP If you are delivering content for a region that requires an integrated loudness level other than -23, you can change the target loudness level in the Project Setting's General options.

Although they analyze and measure audio differently, Loudness Units and Decibels have a 1-to-1 relationship which makes it easy to adjust faders when targeting the integrated loudness level. For instance, if the integrated loudness display shows +2 LUFS after you play through your program, you can use the master fader to lower the decibels by -2 dB and reach the targeted 0 in the Integrated display.

- 5 Raise or lower the master fader as necessary (a boost of about 1.5db should work here) to get the integrated level closest to 0 (-23 LUFS).

- 6 Reset the meter, click Pause, and play the timeline again.

Don't worry if your levels aren't perfect. Just be aware of the Loudness meters and the Integrated loudness goals before you finally output your project.

- 7 Save your progress.

NOTE To listen to a version of this timeline completely mixed, feel free to open and play the 07 FINAL OUTPUT timeline.

Lesson Review

- 1 What steps do you need to perform in the Edit page to prepare your timeline for audio mixing in the Fairlight page?
 - A) Export your timeline as an XML file, and open this file in the Fairlight page.
 - B) Choose File > Send to Fairlight.
 - C) Click the Fairlight page button.

- 2 Which Mixer control would you use to play one audio track from either the left speaker, the right speaker, or any surround speaker attached to your system?
 - A) Pan
 - B) Dynamics
 - C) EQ

- 3 Which control would you use to make dialogue sound a little less bass-heavy?
 - A) Pan
 - B) Dynamics
 - C) EQ

- 4 Where would you set up a set of submixes for your dialogue, effects, and music tracks?
 - A) Fairlight > Bus Format
 - B) Fairlight > Bus Assign
 - C) Fairlight Patch Input/Output

- 5 How do you change the Target Loudness level from the default value of -23 LUFS?
 - A) You cannot change the Target Loudness level.
 - B) In Project settings
 - C) In User Preferences

Answers

- 1 C. Switch to the Fairlight page and continue working. You can switch between the Edit page and the Fairlight page at any time.
- 2 A. The Pan controls.
- 3 C. The EQ controls.
- 4 A. Submixes and mains are setup in Fairlight > Bus Format. Individual tracks and submixes can then routed appropriately using Fairlight > Bus Assign, or by using the Main and Submix buttons in the Mixer.
- 5 B. The Target Loudness level is set in the Audio Metering section of the General Options panel in Project settings.

Lesson 10

Delivering Projects

When you're ready to export a project—whether at the end of a workflow, at an intermediate point, or when generating dailies—the render settings and final output are configured in the Deliver page of DaVinci Resolve 15.

The aim of this lesson is to shed some light on advanced exporting options. You'll gain an understanding of working with subtitles, outputting for digital cinema and outputting multiple jobs from different projects.

Time

This lesson takes approximately 40 minutes to complete.

Goals

Working with Subtitles	344
Delivering Programs with Subtitles	354
Configuring a Timeline for Digital Cinema	356
Rendering a DCP	359
Rendering and Editing Jobs from Multiple Projects	364
Lesson Review	367

Working with Subtitles

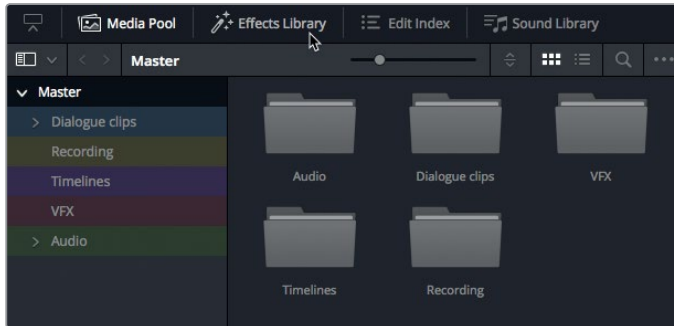
DaVinci Resolve 15 allows you to add subtitles to your timelines in several ways. You can manually create all your subtitles for your project, or you can import a supported subtitle .srt file.

- 1 In the Project manager, right-click and choose Import. Navigate to R15 Editing 201 > Lessons > Lesson 10 Delivery. Select R15 Editing Lesson 10 Deliver.drp, choose Open, and click OK to import the project into your Project manager.

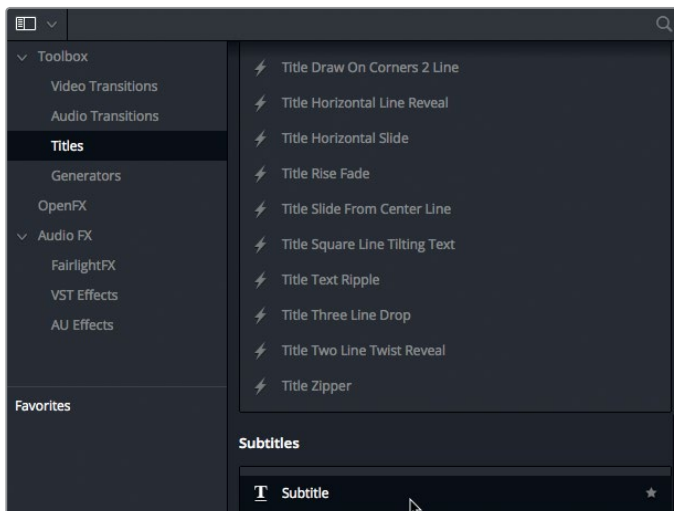
- 2 Open the project, and relink media files.

This project contains a finished version of the scene between the doctor and the FBI agents. Take a few minutes to reacquaint yourself with the scene and how the audio is mixed. All that's left for you to do is add subtitles before outputting the final files for delivery.

- 3 On the Edit page, open the Effects Library.

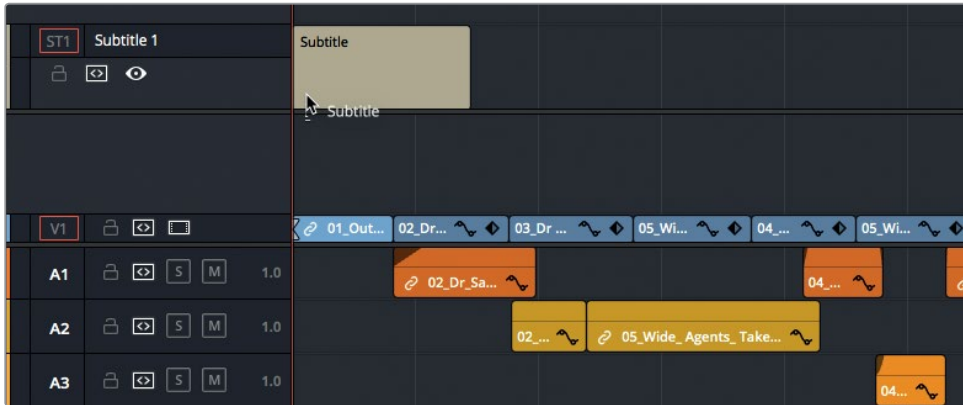


- 4 In the Effects Library, in the Titles group, locate the Subtitles section.



- 5 Drag the Subtitle generator to the timeline in the space above the video tracks, and snap it to the beginning of the timeline.

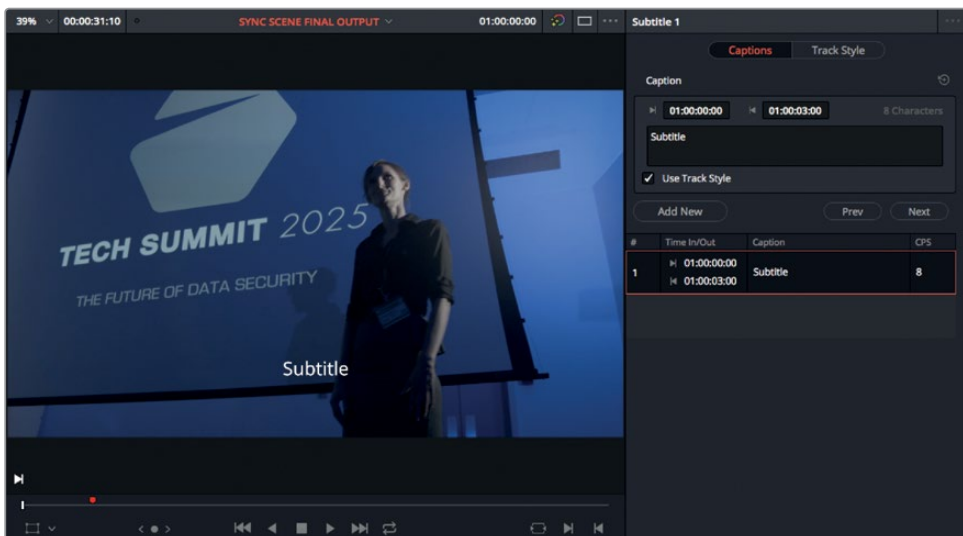
A new track appears in the Timeline labelled “ST1 Subtitle 1,” and the subtitle text appears in the timeline viewer.



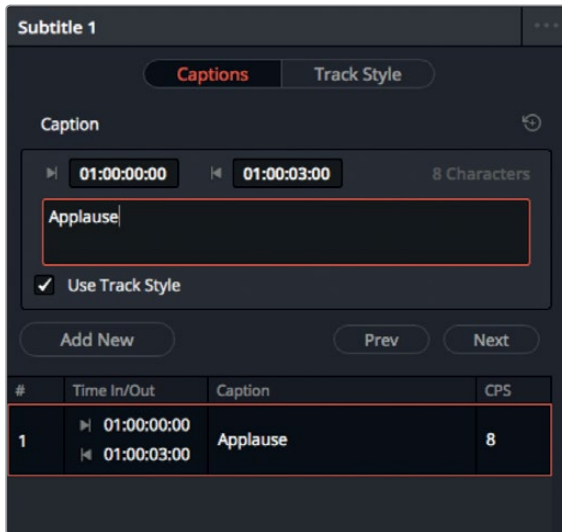
TIP You can show and hide existing subtitle tracks in the Timeline View Options menu.

- 6 In the timeline, select the subtitle, and open the Inspector.

The Inspector includes the controls for the individual subtitle captions and for the entire subtitle track.

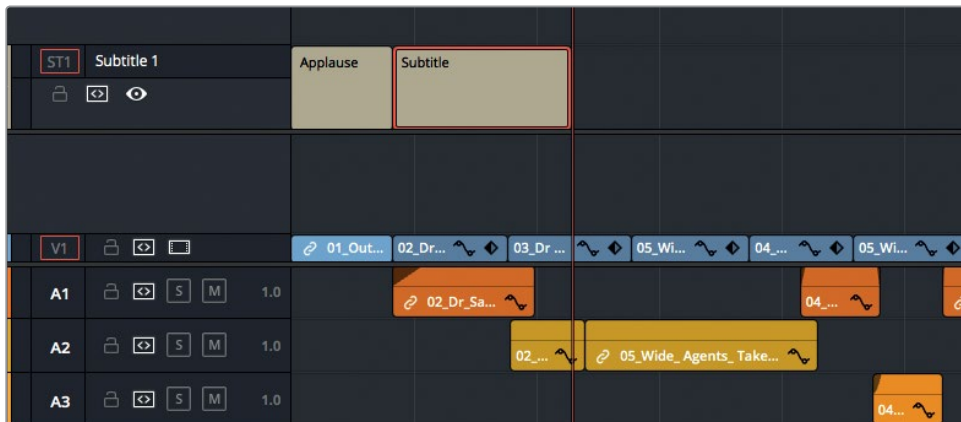


- 7 In the Caption field, highlight the word “Subtitle,” and type **Applause**.

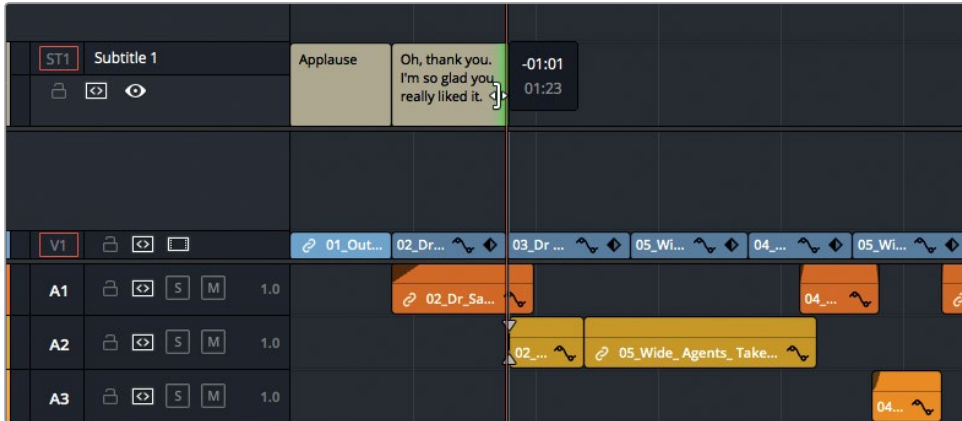


NOTE Settings for the maximum number of characters per line and the minimum duration for each of your captions is set in the Subtitles panel of the Project settings window.

- 8 Place the timeline playhead at the start of the second clip in the timeline, **02_Dr_Sarah_Close Up.mov**, and in the Inspector, click the Add New button. A new subtitle is overwritten into the timeline at the current playhead position.



- 9 Select the new Subtitle generator, and in the Inspector, type the dialogue from the doctor, “**Oh, thank you. I’m so glad you really liked it.**”
- 10 Trim the end of the second Subtitle generator to the end of the second clip on V1, [02_Dr_Sarah_Close Up.mov](#).

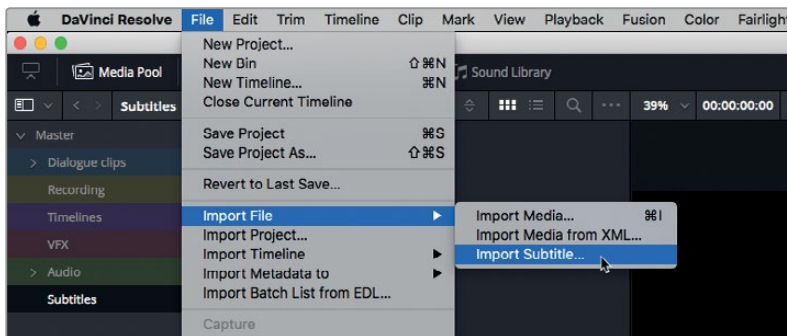


You can edit and trim Subtitle generators, just like any other clip on your timeline.

Importing Subtitle Files

You can continue working through this timeline, adding subtitles for the lines of dialogue. However, it’s usually much more efficient and accurate to have someone transcribe the dialogue for you, and create a .srt file that you can import directly into Resolve.

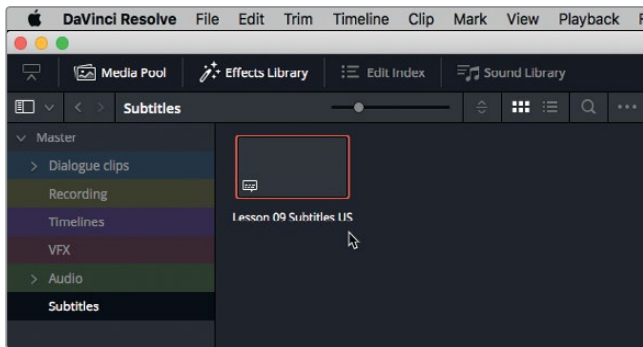
- 1 In the Media pool, press Shift-Cmd-N (macOS) or Shift-Ctrl-N (Windows) to create a new bin. Change the name to **Subtitles**.
- 2 Choose File > Import File > Import Subtitle.



- 3 Navigate to R15 Editing Lessons > R15 Editing Lesson 10 Deliver, and select the file [Lesson 10 Subtitles US.srt](#).

4 Click Open.

The .srt file is added to the selected bin as a subtitle clip.



5 Select the subtitle file. **Lesson 10 Subtitles US**, and drag it into the timeline so it starts at the location of the red timeline marker.



All the subtitles in the .srt file are added to the Subtitle 1 track in the timeline.

Adjusting Subtitles

Subtitles clips behave just like any clip in the Resolve timeline, so you can easily adjust their timings, as necessary.

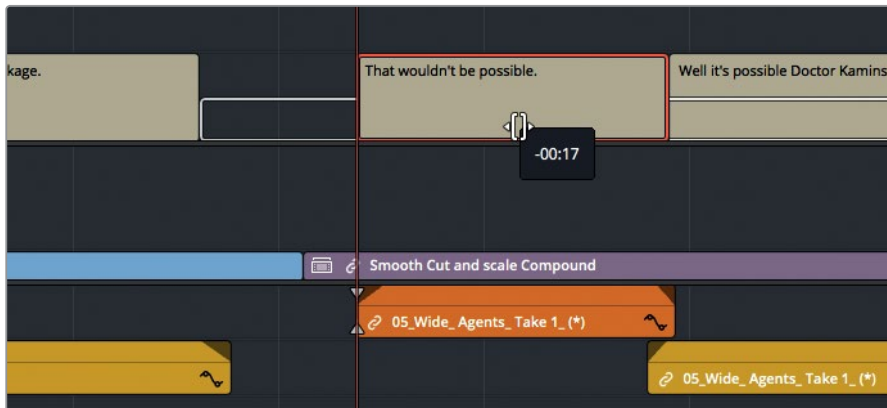
1 Type **1814** to navigate to the point before the doctor says, “That wouldn’t be possible.” Play the timeline from this point to review the dialogue and subtitles.

The subtitles appear on-screen too late for the doctor’s line of dialogue. You’ll need to adjust the subtitle timing to sync it correctly.

2 Press T to enter Trim edit mode.

3 In the timeline, select the lower portion of subtitle, **“That wouldn’t be possible,”** so the mouse pointer changes to a slide icon.

- Slide the subtitle back to the left by about 17 frames, or until it snaps to the beginning of the doctor's audio clip on A1.



- When you have finished sliding the subtitle into the correct position, press / (slash) to review the change.
- Press A to return to Selection mode.

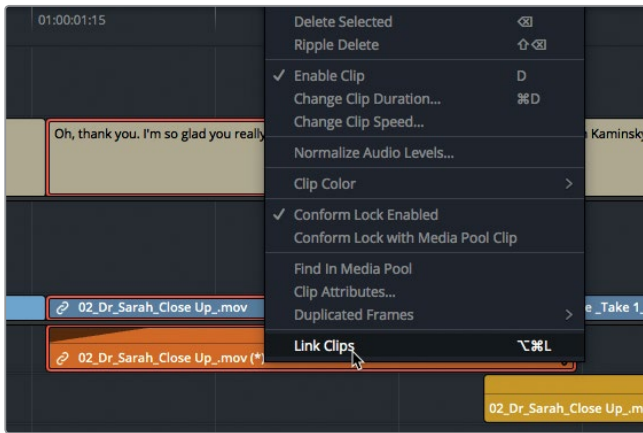
You can also ripple and roll trim each of the subtitle generators, as well as cut each subtitle into shorter clips using the Razor Edit mode and keyboard shortcuts. Be aware that auto select controls for the subtitle track work the same as they do across all the other tracks in the timeline.

Maintaining Subtitle Sync

If you want to further ensure that your subtitles remain synced to the appropriate audio clips, you can link the clips. By doing so, if you inadvertently change the timeline and knock the subtitles out of sync, red clip sync indicator will show how far out of sync they are.

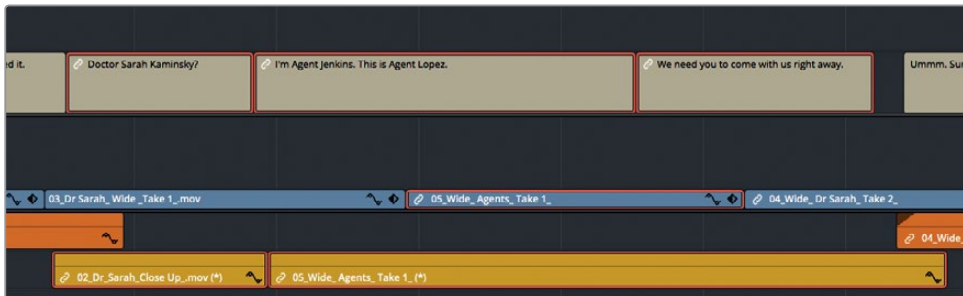
- In the timeline, select the second subtitle clip with the text, "Oh thank you, I'm so glad you really liked it."
It makes sense to link this subtitle with the audio clip on A1.
- Select the second subtitle clip, and in A1, Cmd-click (macOS) or Ctrl-click (Windows) the orange audio clip.

- 3 With both clips selected, right-click either of them, and at the bottom of the shortcut menu, choose Link Clips, or press Opt-Command-L (macOS) or Alt-Ctrl-L (Windows) to link these clips.



You can also link multiple subtitles to multiple video and audio clips.

- 4 In the timeline, select the next three subtitle clips along with the two yellow audio clips on A2.
- 5 Press Opt-Command-L (macOS) or Alt-Ctrl-L (Windows) to link these clips.

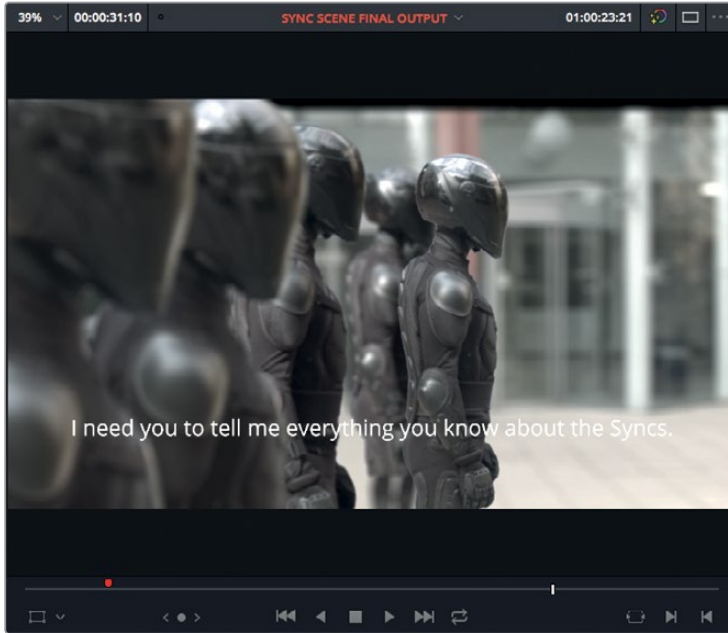


These clips are now linked and will display the red out-of-sync indicators if they lose sync.

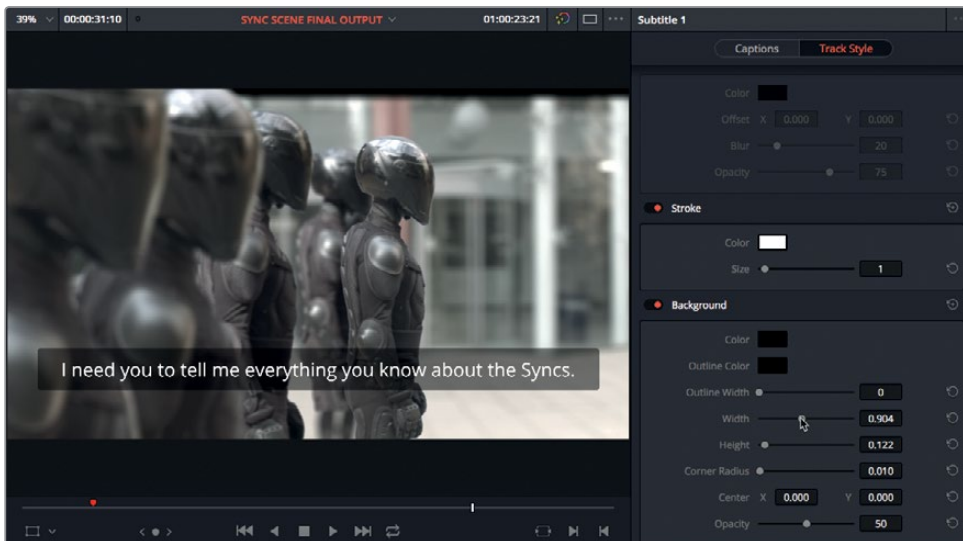
Styling Subtitles

Just as with any other title generator in Resolve, subtitle generators have many parameters that you can change to adjust the style and position of your subtitles and closed captions. One common style applied to subtitles is a semi-transparent box behind the text to help it stand out against video with a similar brightness.

- 1 Move your playhead over the last subtitle in your timeline.
The end of the line appears a little obscured against this final shot and isn't easy to read.



- 2 In the timeline, select the subtitle, and in the Inspector, click the Track Style tab.
- 3 Scroll down to the Background options, and click the switch to enable the Background settings.
- 4 Adjust the Width and Height settings so that the box extends behind the white text and helps it stand out from the similarly light video background.



Because you have added this track style, all the subtitles in this track are updated with the change. This behavior is particularly useful when you need to modify style settings for all the subtitles in a track.

You can, however, override those track-wide settings for any individual subtitle when you need to adjust the color, font, or position of one or more subtitles, but not all.

- 5 In the timeline, move the playhead to the first subtitle.

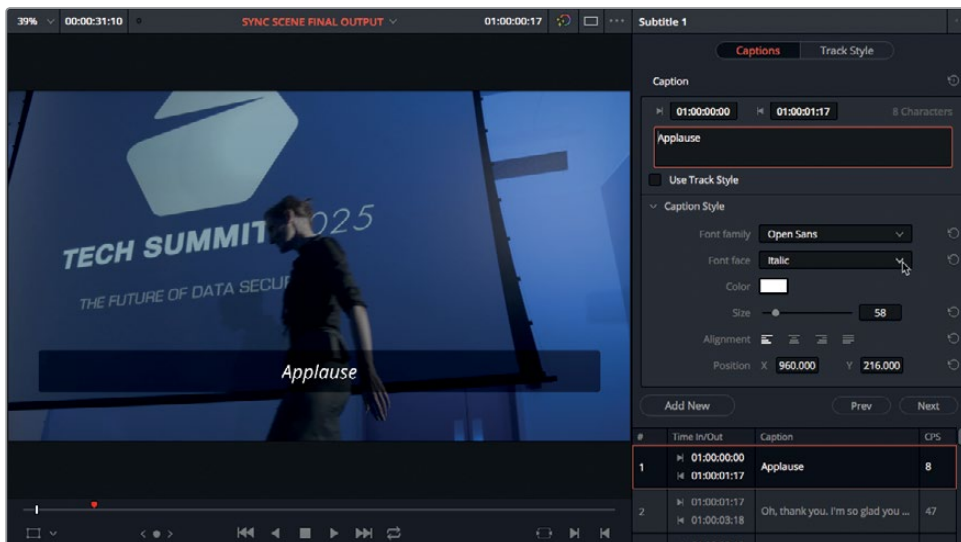
This subtitle indicates a sound effect rather than detailing spoken dialogue. As such, the director would like you to adjust it to appear a little more obvious.

- 6 In the timeline, select the subtitle, and in the Inspector, select the Captions tab.

- 7 Deselect Use Track Style.

A set of additional controls appear for this caption.

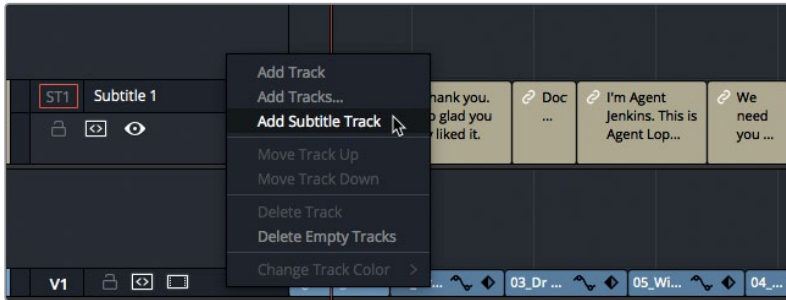
- 8 Change the “Font face” to Italic to distinguish this caption from the other captions. The subtitle updates to reflect the change in style.



Adding Additional Subtitle Tracks

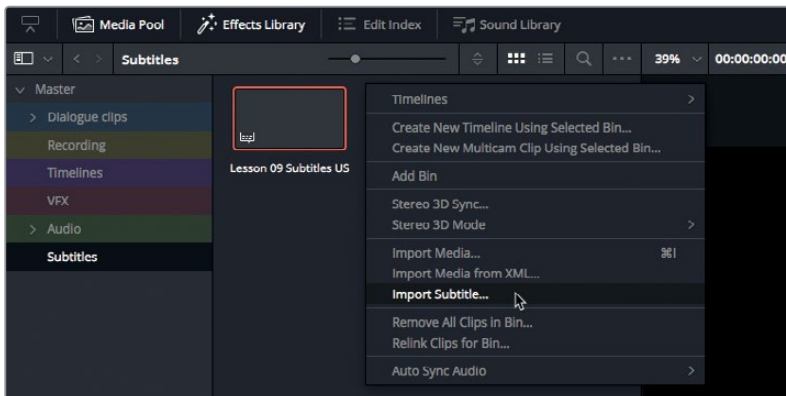
You can add multiple subtitle tracks, which is particularly useful when you have to supply subtitles in more than one language.

- 1 In the Edit page, right-click any one of the timeline track headers, and choose Add Subtitle Track.



An additional subtitle track is added to the timeline.

- 2 In the Media pool's Subtitles bin, right-click, and choose Import Subtitle.



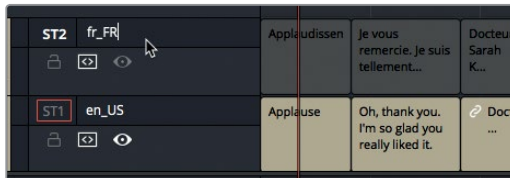
- 3 Navigate to R15 Editing Lessons > R15 Editing Lesson 10 Deliver, and select the **Lesson 10 Subtitles FR.webvtt** file. Click Open.
- 4 Edit this new subtitle file into the empty subtitle track you just created, starting at the beginning of the timeline.



This subtitle file includes French subtitles. You can rename subtitle tracks to reflect the language used, making it easier to identify the different tracks.

NOTE This subtitle has none of the styling included with the previous subtitle you worked with; however, because the WebVTT format has support for basic text formatting, the first subtitle is italicized.

- 5 Double-click the Subtitle 1 track name, and type **en_US** to identify this subtitle as English for a US audience.
- 6 Double-click the Subtitle 2 track name, and type **fr_FR** to identify this subtitle as French for a French audience.



TIP To choose the subtitle track visible in the timeline viewer, in the head of the track you wish to view, click the eye icon. You can display only one subtitle track at a time.

More Info

Depending on your workflow and delivery specifications, you may be required to use standardized two- or three-letter abbreviations for each language as dictated by the International Organization for Standardization.

See the website at www.loc.gov/standards/iso639-2/php/code_list.php for more details.

Delivering Programs with Subtitles

When it comes to delivering subtitles with your finished program, a number of options are open to you. Depending on your delivery format, you can include subtitles as burned-in graphics, embedded text in a supported media file, or as a separate file.

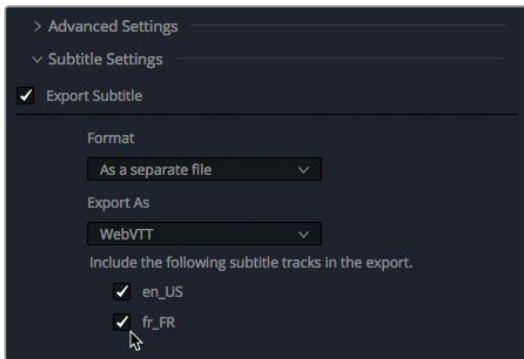
In this next exercise, you will output a file suitable for web delivery together with the necessary separate subtitle files.

- 1 On the Deliver page, in the Render Settings window, choose the Vimeo 720p preset.

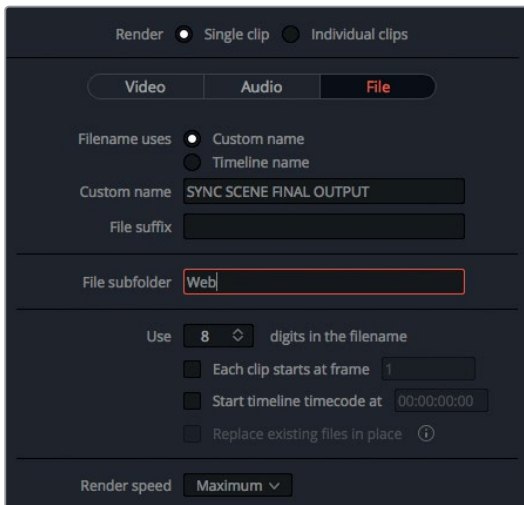
- 2 Scroll to the bottom of the video tab, expand the option for Subtitle Settings, and choose to Export Subtitle.
- 3 Set the Format options to “As a separate file”.

If you chose the “Burn into video” option, Resolve would burn the currently active subtitles (with their styles) into the final rendered video file, so the subtitles would be permanently included as part of the video content. Choosing “As embedded captions” will output the currently active subtitle track as an embedded metadata layer within those media formats that support it. Currently, DaVinci Resolve has support for CEA-608 and text captions within MXF OP1A and QuickTime containers.

- 4 In the Export As pop-up menu, choose WebVTT and select both the “en_US” and “fr_FR” subtitle tracks to include them in the export.



- 5 Click the Location Browse button, and navigate to R15 Editing Lessons > R15 Editing Lesson 10 Deliver > Output folder to choose the destination for your exported content. Click ok.
- 6 Click the File tab, and in the “File subfolder” field, type **Web**.



7 Click Add to Render Queue.

The job is added to the Render Queue; but before you start the render, you may want to add more jobs and process them all at once.

Understanding Data Levels

In the Advanced Settings, Data Levels specifies the data range of an image based on its source. The default Auto setting renders media at a data level that is appropriate for the selected codec. Video refers to YCbCr formats that constrain to pixel data values between 64-940 on a 10-bit system in formats using a Rec.709 video standard. Full expands the range to the film standard of 4-1024 values, which is utilized in digital film formats such as DPX. In general, the choice is leave this setting unchanged and let DaVinci Resolve choose the data level automatically. However, if you find that your final video looks substantially darker or lighter than it appears on your calibrated monitor, it is possible that the data levels are being incorrectly distributed. In that rare case, you may want to manually set the Data levels correctly for your intended distribution.

Configuring a Timeline for Digital Cinema

A *digital cinema package*, or DCP, is a collection of media and metadata files used to project digital movie files in a theatrical venue. Resolve makes it convenient to create an unencrypted digital cinema package. . This exercise will combine some practical information about the DCP with the few configuration steps required in the Deliver page.

TIP DaVinci Resolve 15 also allows for the creation of encrypted DCP files using the easyDCP plug-in.

When creating a DCP, the timeline in Resolve must be set to one of three 2K resolutions:

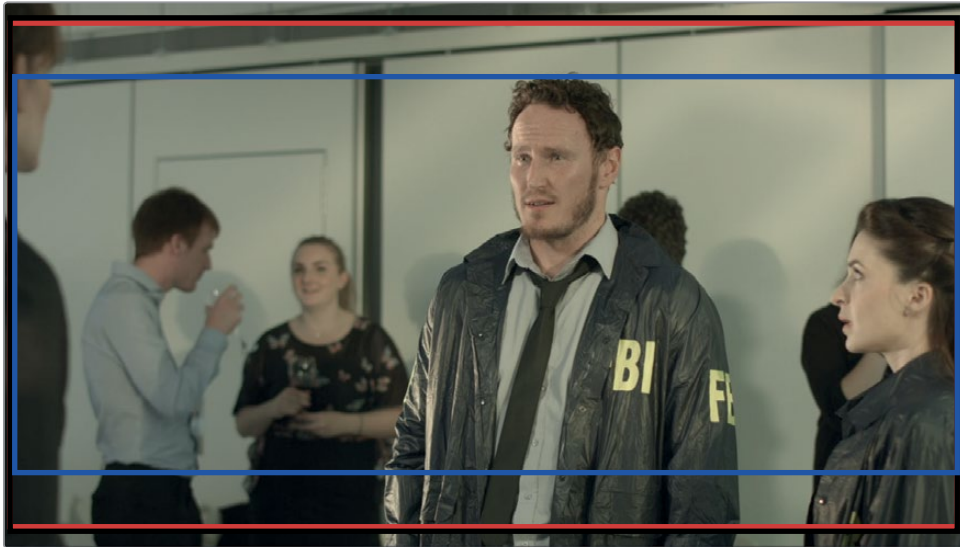
- 2K Native (1.90:1) 2048 × 1080 @ 24, 25, 30, 48, 50 and 60 fps
- 2K Flat (1.85:1) 1998 × 1080 @ 24, 25, 30, 48, 50 and 60 fps
- 2K CinemaScope (2.39:1) 2048 × 858 @ 24, 25, 30, 48, 50 and 60 fps

Or one of three 4K resolutions:

- 4K Native (1.90:1) 4096 × 2160 @ 24, 25, 30, 48, 50, and 60 fps
- 4K Flat (1.85:1) 3996 × 2160 @ 24, 25, 30, 48, 50, and 60 fps
- 4K CinemaScope (2.39:1) 4096 × 1716 @ 24, 25, 30, 48, 50, and 60 fps

This project is a Rec.709, full HD-resolution project. But as is often the case, you may have to output deliverables in multiple formats. So, let's assume you need to output a DCP. The resolution for your DCP will be 2K flat because it is the closest resolution option when starting from full HD. You will still need to scale the project up and crop some of the top and bottom but not by much.

16 x 9 frame 1.78:1



Native 1.9:1



Flat 1.85:1

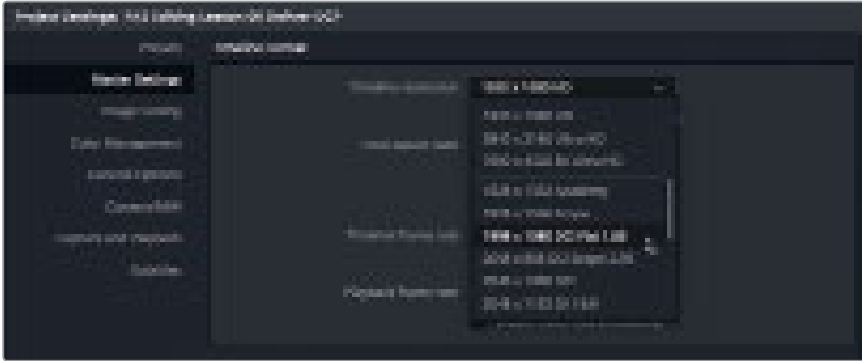


Scope 2.39:1



TIP 4K DCPs use a lower bit rate when played on 2K projectors than do 2K DCP's. For that reason, when your target projector is 2K, always make a 2K DCP, even if your content supports higher resolutions.

- 1 Choose File > Save Project As, and save a copy of this project as **R15 Editing Lesson 10 Deliver DCP**.
- 2 Choose File > Project settings, or press Shift-9.
- 3 In the Master settings, set the "Timeline resolution" to 1998 x 1080 DCI Flat 1.85.



- 4 In Input Scaling, set the “Mismatched resolution files” to “Scale full frame with crop”.



Scaling full frame with crop ensures that the shortest dimension of the source clip fills the timeline resolution’s frame to omit letterboxing or pillars. However, it does crop a small bit off the top and bottom of the image.

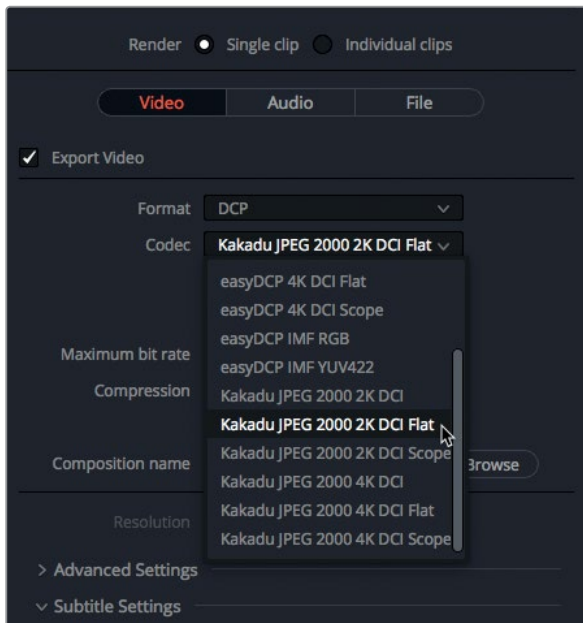
- 5 Click Save to close the window.

That takes care of the frame size, but your timeline frame rate is 23.976 fps and almost all DCPs use 24 fps. Fortunately, DCP interprets 23.98 fps as 24 fps, and audio playback is pulled up to match.

Rendering a DCP

Now all your formatting is done, and you can move to the Deliver page to set up some DCP-specific parameters.

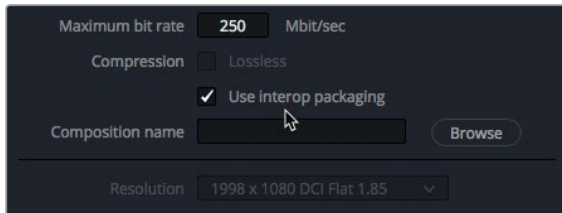
- 1 In the upper-left, in the Render Settings, click Custom.
Because there's no default preset available for outputting a DCP package, you'll create your own.
- 2 In the Render area, choose Single Clip.
When creating a DCP, you will always want to output a single file for your project.
- 3 In the Video tab, in the Format menu, choose DCP.
- 4 In the Codec menu, choose Kakadu JPEG 2000 2K DCI Flat.



TIP The above settings will produce an unencrypted DCP package. If you need to produce an encrypted package, you should choose one of the easyDCP settings in the Codec pop-up menu. A demo version of easyDCP is included in all versions of Resolve that will allow you to playback up to fifteen seconds of good quality picture and sound that includes a visible watermark. For full functionality, licensing modules must be purchased from www.easyDCP.com, and Server Certificate Sets must be generated for each DaVinci Resolve system. See the DaVinci Resolve Manual for additional information.

Let's leave the maximum bitrate at 250 Mb/sec because that is the limit of most projectors.

The next checkbox determines if you are generating the DCP based on the older but more widely supported interop standard, or the more current and feature-rich SMPTE standard. One of the benefits of using the SMPTE standard is that it supports a wider range of framerates. The major benefit of using the interop standard is that it will work in more theaters, even though it is limited to only 24 or 48 fps.



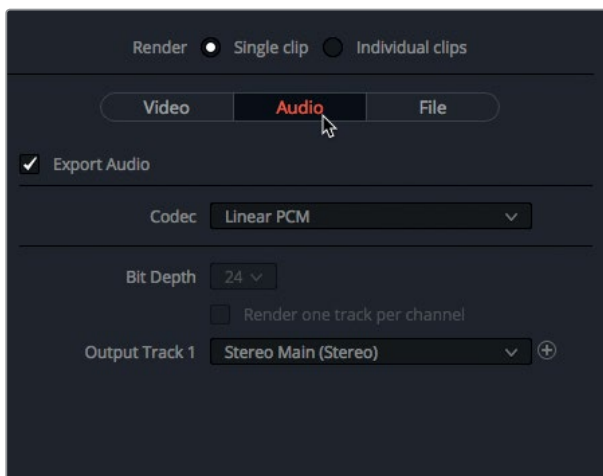
TIP DCP uses the XYZ color space. The color space conversion is performed during the export to DCP. The source color space is determined by the timeline color space setting in the Color Management settings, even when DaVinci YRGB color management is not in use.

Setting Audio for DCP

Audio can have a few fits when exporting to a DCP. Stereo mixes such as in this project can be troublesome. First, a stereo soundtrack will be heard differently depending on the side of the theater you are sitting on, and the mono dialogue track will tend to get lost. If your project does not have a full surround sound mix, you can avoid these two-channel stereo issues by creating a three-channel LCR (left, center, right) mix for your stereo soundtrack. All the dialog will go to the center channel while music and sound effects go to the left and right channels.

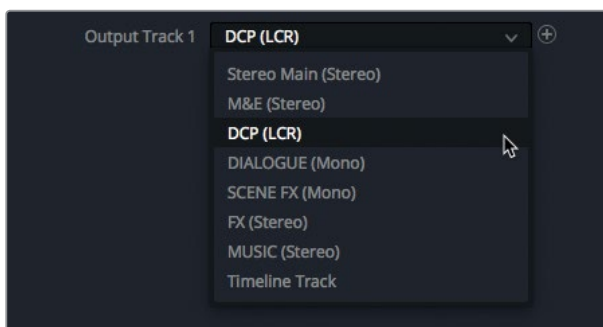
If you are finishing your audio in the Fairlight page, you only need to set up a Main bus in the desired format. In this project, you set up an LCR Main bus in Lesson 8. If you also have a 5.1 or 7.1, or lmax mix to output, you could add those additional Main busses which would provide for correct signal panning in the Mixer.

- 1 Click the Audio tab.



Your only audio codec choice is Linear PCM. DCP audio is converted to broadcast .WAV files in an MXF wrapper at 24-bit, 48 kHz. The important aspect that you do control is which Main or Submix you want to output.

- 2 In the Output Track 1 menu, choose the DCP (LCR) mix that you created in Lesson 8.



TIP If you are providing multiple DCPs in various languages, a mixer setup with separate M&E and dialogue sub buses would be the desirable mixer configuration.

One of the benefits of using Fairlight to mix your audio, other than the fact that it is built into your editing and color grading system, is that it is somewhat format agnostic, so you can mix content once and then output to several formats. You can easily switch between stereo, LCR, and surround formats, and various speaker configurations with monitor control and metering following the selected set.

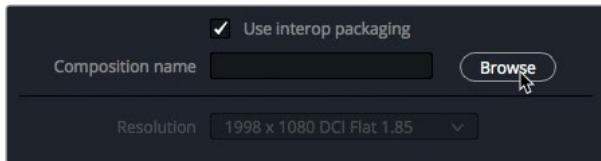
Naming and Outputting a DCP

DCPs follow a somewhat specific, yet voluntary Digital Cinema Naming Convention for the content title. For each version of a movie you create (such as the English 5.1 version, the Spanish 5.1 version, the stereo version, the in-flight version, and so on), a composition play list (CPL) must be created that contains the appropriate content name. DaVinci Resolve includes a straightforward way to create a name that follows this naming convention using the DCP Composition Name Generator window.

- 1 Click the Video tab.

Access to the content title creation tool is located in the Video tab.

- 2 Scroll down to locate Composition name, and click Browse to open the Composition Name Generator window.



Here, you can enter the metadata that will be used to create a content title that is compatible with DCP servers and theater management systems.

TIP Separate the words in your movie's title using initial caps, not spaces, hyphens, or underscores.

- 3 Enter information, and from the various menu options, choose the metadata that will be added to the content title. Click OK to close the window.

DCP Composition Name Generator

SyncSceneFinal_TST-1_F-185_EN-XX_US-NR_20_2K_NULL_20180713_NUL_SMPTE_OV

Film Title: SyncSceneFinal

Content Type: TST (Test) | 1 (Version 1)

Temp Pre RedBand Chain 3D 2D 4f 6f 24 DVis EC

Projector Aspect Ratio: F-185 (Flat)

Audio Language: EN (ENGLISH)

Subtitle Language: XX (NO SPOKEN LANGUAGE) | OCAP CCAP

Territory: US (UNITED STATES)

Rating: NR (NOT RATED)

Audio Type: 20 (Stereo) | Hi Vi SL Atmos Auro DTSX DBox

Resolution: 2K (2K)

Studio: NULL (Not Specified)

Date: 20180713 | Use current date

Facility: NUL (Unspecified)

Standard: SMPTE (SMPTE)

Package Type: OV (Original Version)

Cancel OK

The content title is not to be confused with the folder name that contains the DCP. That folder name is still managed in the File tab of the Deliver page.

- 4 Click the File tab, and add a custom name as you would for any other output.

Finally, you need to select a destination for this DCP. Because you had previously set the output location in the earlier exercises, we just need to specify a different File subfolder.

- 5 In the File subfolder field, type **DCP**.

Render Single clip Individual clips

Video Audio **File**

Filename uses Custom name Timeline name

Custom name: Untitled

File suffix:

File subfolder: DCP

Use 8 digits in the filename

Each clip starts at frame 1

Start timeline timecode at 01:00:00:00

Replace existing files in place ⓘ

TIP You can output the DCP to a hard drive in a Cru Dataport DX-115 enclosure which will load directly onto many digital cinema servers and is often required by some film festivals. More conveniently, you can output to a USB 2.0 or 3.0 hard disc or USB stick if your film’s file size fits. No matter what storage device you choose, the device must be formatted as a Linux EXT2 or EXT3 drive. You can do so in a macOS or Windows environment by installing Linux in a virtual environment. Some servers do not deliver enough power for some USB-powered drives to mount. In those scenarios, be sure to use a USB drive that uses an external power source.

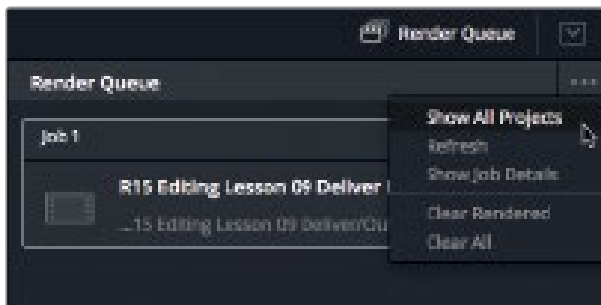
- 6 When you are done selecting your drive destination, click “Add to Render Queue”.

After your DCP is rendered onto the correct hard drive, you’ll want to test it. The only foolproof way to test your DCP is to rent a theater and run it just as it would be projected for an audience. Only that way can you be absolutely sure that the color conversion worked perfectly, and the sound mix is what you wanted. In the meantime, you can view the DCP package contents by importing it into Resolve.

Rendering and Editing Jobs from Multiple Projects

The Render Queue can show jobs from the current project or from all projects in your database. If you split longer projects into reels, or you are working on timelines with different frames rates for the same client, you might need to access all of the jobs in the queue instead of waiting for one batch to render before outputting other projects.

- 1 Verify that the Deliver page is open.
- 2 In the Render Queue options menu, choose Show All Projects.



Any jobs added to the Render Queue in any project currently in the database are displayed for you to select and render.

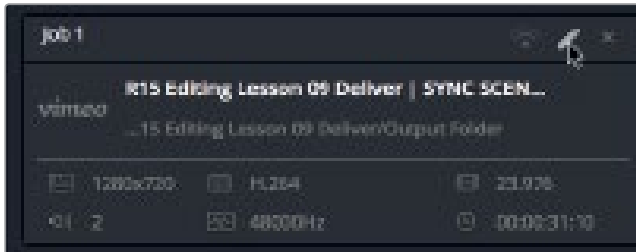
Even after you add jobs to the Render Queue, you can update their settings or remove them from the queue entirely.

- 3 In the Render Queue options menu, choose Show Job Details.

The specific settings for each job are displayed, including resolutions, codec, and framerate.



- 4 In the Render Queue, click the pencil icon on Job 1.



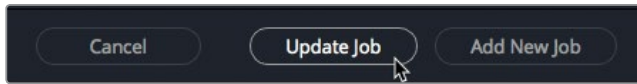
Because this job was sourced from another project, the project is switched and the Render Settings change to reflect the settings of the previous job.



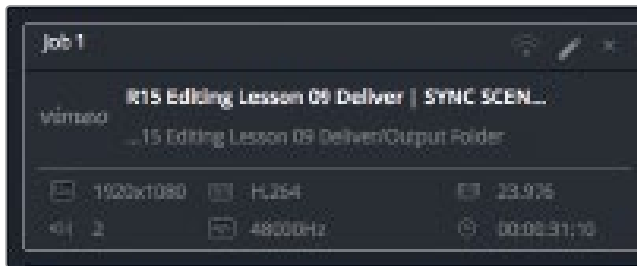
The presence of additional Update Job and Cancel buttons at the bottom of the Render Settings indicates that a job is currently being edited.

Let's make a small change to update the job

- 5 In the Video tab, change the resolution to 1920 x 1080 HD.
- 6 Click Update Job.



The change updates the original Vimeo job settings with the new setting as is reflected in the displayed job details in the Render Queue.



TIP To delete a job, click the X in the upper-right corner of the job in the Render Queue.

- 7 Finally, verify that neither of the jobs are selected in the Render Queue, and then click the Start Render button to create the output files.

Remote Rendering

DaVinci Resolve Studio allows you to offload rendering to another Resolve workstation. Remote rendering requires that all workstations have a copy of DaVinci Resolve 15 Studio installed, a shared Postgres database, and access to all necessary media files using the same file name path. With one computer acting as a render station, all other Resolve stations can continue to be used for further editing and grading.

Utilizing the correct render settings is vital to delivering an aesthetically correct and technically functional video project. Understanding these settings has even greater benefits. It elevates your skillset as an editor and imbues confidence that your projects are delivered at their optimal quality and adhere to industry standards.

This book has covered a range of editing workflows and tools, while making frequent references to craft techniques. However, it is important to remember that even when following common guidelines within the craft, each editor has a high degree of leeway in the workflows he or she chooses.

As with any technical and creative skill, editing takes practice and experimentation to master. In the early stages of your career, you will experience times of uncertainty and self-doubt when cutting a scene. So, it is important to utilize your tools wisely, and approach each editing challenge with the intention to produce the clearest possible story.

Listen to feedback and re-evaluate your previous work to understand what did and didn't work (and why). In time, by working through many editing issues and identifying your preferred workflows, you'll acquire a greater sense of confidence in your ability, and a defining command over your personal and professional editing style.

Lesson Review

- 1 Depending on the format you choose, what options might you see when choosing to output subtitles with your final video file?
 - A) Burn into video
 - B) As embedded captions
 - C) As a separate file
- 2 What are acceptable aspect ratio standards for 2K and 4K cinema?
 - A) DCI, DCI Flat, and DCI Scope
 - B) 2.35:1, 1.85:1 Anamorphic, and 16:9 Square Pixels
 - C) CinemaScope, IMAX, and Supermarionation
- 3 True or False? You can adjust the settings of a job that's already been submitted to the Render Queue.
- 4 Where do you specify the Composition Name for your DCP?
 - A) In Project settings
 - B) In the DCP Render Settings
 - C) Choose File > easyDCP > import KDM/Digest.
- 5 True or False? You can access jobs submitted to the Render Queue from other projects in your database in the Project manager?

Answers

- 1 A., B., and C. Subtitles can be output as burned in captions, as separate files (either .SRT or .WebVTT), or as embedded captions (Text or CEA-608) for QuickTime or MXF OP1A containers.
- 2 DCI, DCI Flat, and DCI Scope
- 3 True. Click the pencil icon for any job that's currently in the Render Queue. You can then update the current settings in the Render Settings before clicking Update Job.
- 4 B. In the DCP Composition Name Generator window—which you find in the Video tab of the Render Settings, and access by clicking the Browse button next to the Composition Name field.
- 5 False. To access jobs submitted to the Render Queue from different projects, click the Render Queue options menu, and choose Show All Projects.

Congratulations!

Congratulations! You just completed some high-end professional audio post-production from the comfort of your own computer workstation. Hopefully this lesson has opened your eyes and ears to the wonderful, yet often underappreciated world of audio post, as well as the awesome audio tools available as standard in DaVinci Resolve.

Test your skills by taking the online assessment: <http://bit.ly/2O5197B>

A

Animation

- Curve Editor, 238
- Keyframes, 237, 255, 256

Audio

- dB, 293, 311, 312, 313, 316, 317, 339
- fade, 291, 302
- level, 124, 126, 283, 288, 292, 293, 299, 300, 302, 309, 314, 315, 316, 317, 318, 331, 337, 338, 339, 341, 356
- loudness, 338, 339
- meters, 285, 335, 337, 338, 339
- Mono, 66, 142, 213, 289, 291, 296, 325
- mute, 288
- patch, 211
- recording, 291, 294, 298, 300, 319, 322, 331
- scrubbing, 64, 117
- solo, 293
- waveform, 62, 63, 115, 208, 314

Audio tracks

- add, 126, 213, 360
- Naming, 72, 362
- patch, 210, 211, 212, 213, 214

Auto Select, 119

B

Bin

- list view, 59, 89
- Master bin, 77
- media bin, 263
- new bin, 89, 173
- toolbox bin, 259

Bus Assign, 327, 328, 330, 332, 334, 335, 337, 341, 342

Bus Format, 323, 324, 325, 326, 332, 333, 334, 337, 341, 342

C

- Clip attributes, 64, 65, 67, 70, 220
- Clone tool, 52, 53, 54, 55, 59
- Color Correction, 276
- Color Corrector, 269, 276
- Color Management, 360
- Color page, 165, 244, 314
- Compound Clip, 189, 223, 224, 228, 229, 230, 232, 233, 234, 235, 237

D

- Database, 58, 76, 77, 83, 364, 366, 367
- Deliver page
 - Render Settings, 354, 359, 365, 366
- Delta keyer, 271, 272, 275, 276
- Digital cinema package, 356
- Dynamics, 314, 316, 318
- Dynamic Trim, 147, 148, 151, 152, 153

E

- Edit page, 86, 166, 200, 242, 248, 249, 259, 265, 270, 283, 289, 293, 294, 341, 344, 353
- Effects Library, 130, 245, 246, 247, 250, 256, 267, 270, 344
- EQ, 300, 301, 302, 304, 306, 307, 308, 309, 310, 314, 318, 341

F

- Fairlight page, 283, 286, 294, 296, 300, 314, 318, 323, 331, 332, 338, 341, 360
- Fit to Fill, 207
- Fusion
 - clip, 266
 - color corrector, 276

G

Garbage matte, 274, 275, 276

I

Import

- clips, 69, 86, 114, 140, 172, 200
- projects, 283

Inspector, 129, 131, 133, 223, 228, 229, 230, 243, 246, 247, 251, 252, 254, 256, 258, 260, 261, 265, 268, 294, 300, 301, 302, 303, 345, 346, 347, 351, 352

J

J-cut, 99, 178

JKL keys
scrubbing, 117

K

Keyframes editor

- curve editor, 131, 132, 133, 135, 136, 237, 238

L

L-cut, 99, 106, 177, 178

Link/Unlink, 64

Loudness, 337, 338, 339, 341

M

Media page, 52

Metadata

- keyword, 70, 73, 74, 75
- viewing, 70, 83, 143, 191, 232

Meters, 285, 286, 323, 326

Mixer, 296, 297, 300, 310, 314, 316, 317, 318, 325, 326, 330, 331, 334, 341, 360

Multicamera editing
editing, 186

N

New Fusion Clip, 266, 270

Node, 257, 259, 263, 264, 267, 268, 269, 270

Node editor, 243, 244, 245, 246, 249, 250, 260, 263, 268

Normalization, 299

O

Open in Timeline, 190, 224

Optimized Media, 78, 79, 80, 82, 83, 232

P

Pan, 223, 283, 296, 298, 320, 321

Parade scope, 314

Paste Insert, 145

Power Bins, 76, 77

Projects, 57, 59, 76, 77, 197, 283, 318, 322, 332, 364, 366

R

Razor Edit mode, 349

Render Queue, 356, 364, 365, 366

Ripple delete, 117, 118, 120, 175

Ripple Overwrite, 95

S

Smooth Cut, 130, 131, 172, 178

Speed change

- constant speed change, 155

Split edit, 99, 102, 103, 104

Stabilization, 165, 166

Stacked timelines, 142, 143, 189

Subtitles, 344, 346, 347, 348, 353

T

Timecode, 70, 145

Timeline

- playhead, 64, 115, 116, 117, 140, 144, 160, 161, 189, 231, 242
- resolution, 220

Timeline View options, 287

- audio waveforms, 195

Titles, 344

Toolbar, 16, 20, 25, 49, 52, 55, 104, 106, 147, 153, 165, 169, 170, 243, 250, 255, 257, 259, 260, 263, 270, 274, 284, 301, 319, 320, 322, 323

Tracking, 252, 265, 267, 268

Transition

- duration, 91, 109, 125, 127, 131, 141, 157, 204, 205, 206, 209, 210, 211, 219, 225, 293, 294, 339, 346

Trim Edit mode, 152, 157

V

Versions, 146, 166, 332, 359

Viewer, 144, 166, 244, 246, 247, 250, 258,
261, 263, 264, 265, 267, 268, 270, 271,
272, 274, 289

W

Watermark, 359

Waveform, 62, 63, 115, 116, 208, 314

About the Authors

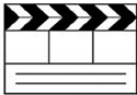
Chris Roberts has over 20 years editing experience and has cut all sorts of programs from online corporate promos to broadcast television. He has been delivering video editing training since 2003 and has worked with non-linear editing software from Avid, Apple and Adobe. Over the years he has trained all sorts of editors; from university students and staff, to broadcast journalists, sports, factual and drama editors. As a Blackmagic Certified Master Trainer he has been responsible for delivering DaVinci Resolve training across Europe. He lives in Worcestershire, UK, with his partner Samantha and, when not working, enjoys reading post-apocalyptic fiction, listening to hard rock and blues music and binge-watching the TV he has invariably missed.

Rory Cantwell is an editor with over 25 years in the industry and has worked for lots of the major broadcasters, post-production facilities and Advertising Agencies over the years, creating a diverse range of content and working in many different genres. Based in the UK, he is a founding partner in Soho Editors Ltd; Europes leading post-production talent agency and a training centre for Black Magic Design, based in the heart of London.

A certified trainer of Apple Final Cut Studio, Autodesk Smoke and then Final Cut Pro X, and a Master Trainer for Blackmagic DaVinci Resolve, Rory initially fell-in-love with Resolve's incredible colour-grading toolset before embracing it as his favourite editor.

EDITSTÖCK

FOOTAGE WORTH EDITING



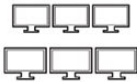
Professionally Shot Films

Teach editing with dailies from professional films. Students can use our footage on their reels.



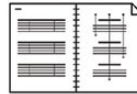
High Resolution Media

Inspire students with beautiful HD images. Raw RED, Arri, and ProRes media are available.



Site Licenses

Educational licenses never expire and apply to any number of students on a campus.



Paperwork Included

Get professionally lined scripts, storyboards, treatments, and other documents used by the crew.

WWW.EDITSTÖCK.COM

ADVANCED EDITING WITH DAVINCI RESOLVE 15

DaVinci Resolve 15 is the world's most advanced editing, visual effects, color correction and audio post production solution. This official Blackmagic Design hands-on training guide will teach you the art and craft of editing using DaVinci Resolve's advanced editing features. The hands-on lessons will show you how to cut dramatic, documentary, music videos and action scenes. You'll also learn how to build eye-catching effects on both the Edit and the Fusion pages. Then you'll learn how to mix audio and deliver your final film for digital cinema, broadcast TV or streaming services.

What You'll Learn

- Backing up and importing media files.
- Organizing and optimizing footage to prepare for editing.
- Professional editing techniques from different genres.
- Frame accurate real-time trimming.
- Advanced transition options.
- Variable speed changes to enhance action.
- Subframe audio editing.
- Syncing multiple camera angles for multicamera editing
- Building complex composites on the Edit Page
- Creating and working with compound clips
- Using keyframes to create sophisticated animations.
- Using the Fusion Page to perform common tasks.
- Editing and mixing audio on the Fairlight Page
- Sweetening dialogue and enhance sound with built-in EQ and Dynamics
- Working with subtitles.
- Delivering projects for digital cinema and online distribution.
- How to setup a collaborative workflow with multiple users.

Who This Book is For

This book is designed for both beginners and professionals. Beginners will find clear and concise lessons to get you up and running quickly. If you're a professional switching from another system, you'll find lessons that cover everything from basic editing and trimming to working with audio, adding text, effects and more. You'll also find dozens of pro tips and tricks that will help you work faster!



Professional Editing



Fusion Effects



Color Correction



Fairlight Audio