tonebase Academy | Recording Course

V. Audio & Video

ACADEMY

Your Instructor: Martin Zimny

Suitable For: All Levels

A tonebase Workbook

“Audio and video belong together, they are two sides of the same coin. Every major label releases new records with cinematic material, and we consume music with our ears as well as with our eyes. Consistent and synchronized capturing of each world will complement and elevate the other!”

Prior Knowledge

• Reaper Basics as covered as in the first lessons
• How to operate your video camera (DSLR, smartphone, camcorder)

Contents

Lesson Summary

In this lesson, we will listen back to your recordings and I will try to give as much feedback as possible! We will use several measurement tools to counter the problem that not every one of us has access to acoustically treated studios and a set of flat frequency response speakers.

What You’ll Learn:

- How and why to use a consistent sample rate between audio and video
- How to ensure your audio and video will be in-sync
- How to use DaVinci Resolve to edit your video
- How to export a high quality music video of your performance

Sample rate

CLICK TO WATCH THE LIVE SESSION (2/8/21 @ 11 AM PST)

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After we have recorded, edited, and finalized our very first audio recording, we want to dip our toes into recording audio and video at the same time!

Music videos have been gaining popularity for decades, and this is even now true for classical music. You won't find any album released by a major record company that is not accompanied by a cross-media campaign with a least a music video or an EPK (electronic press kit). It only makes sense to look at how to edit and released a polished video ourselves, as well.

There are several ways to create a music video, but the most obvious method is to record our audio and video at the same time. However, this isn't always possible, especially if you recorded that perfect audio take without the camera rolling!

There's no need to fret; even major production studios use a technique called "playback" to get around this. While shooting the video, the performers will simply pretend to be singing or playing the recording, while playing the actual pre-recorded audio over a loudspeaker. This gives the studio more creative freedom for the video. Imagine a crew of four cameras, one on a crane, a multitude of buzzing lights and visual effects, and a director shouting orders all over the place, all while our microphones try to capture the most intimate details of a performance.

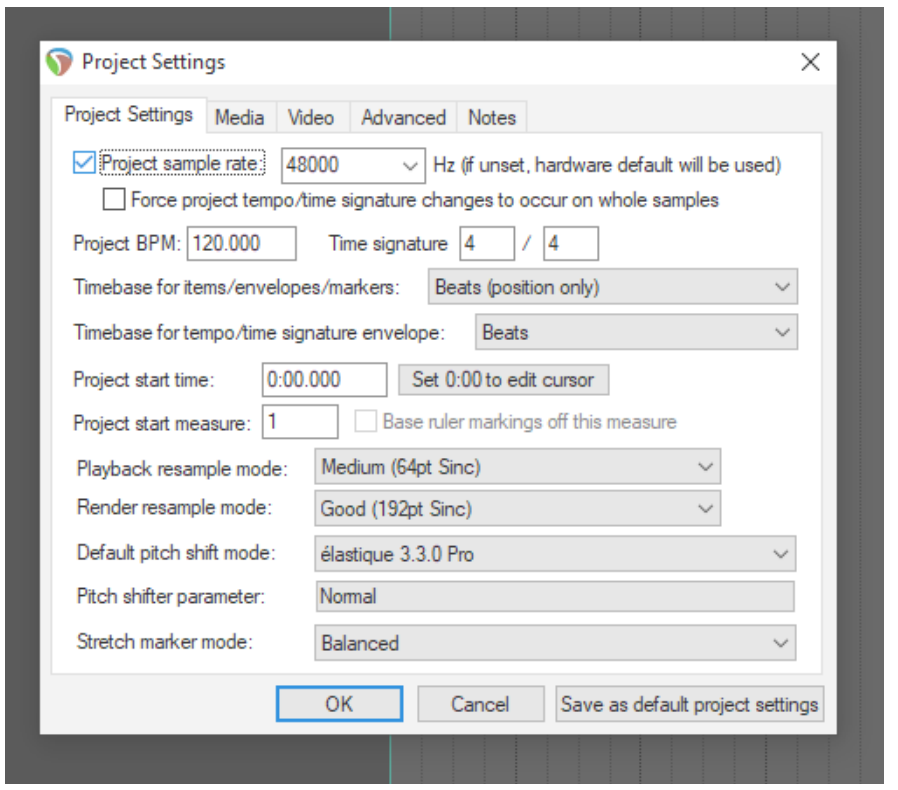
It's simply impractical to do all of this at once. If a music video contains a stellar visual component, it's probably playback. While creating a music video is an art form in itself, people often overlook the fact that the video and audio probably weren't captured at the same time.

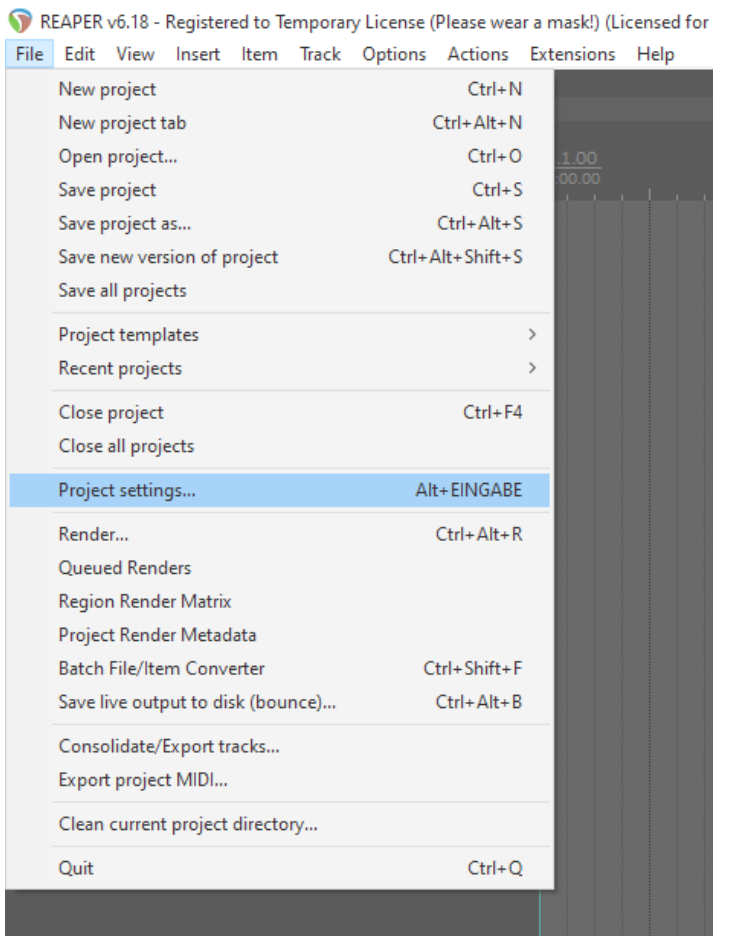
Sample Rate and Sync

We will attempt to record audio and video at the same time and see if we can still figure out a way to do some minor, video-synced edits to our performance. For that, we need to ensure that we work in the standard sample rate for video, which is **48khz**.

To change your sample rate in Reaper, go to **File→Project Settings** or simply hit the keyboard shortcut **Alt+Enter**.

In this tab, you can tick the box for Project Sample Rate and set it to 48000Hz. If you don't check it, Reaper will run on the hardware default, which will probably be 44100Hz or 48000Hz anyway. We'll set it just to be sure.





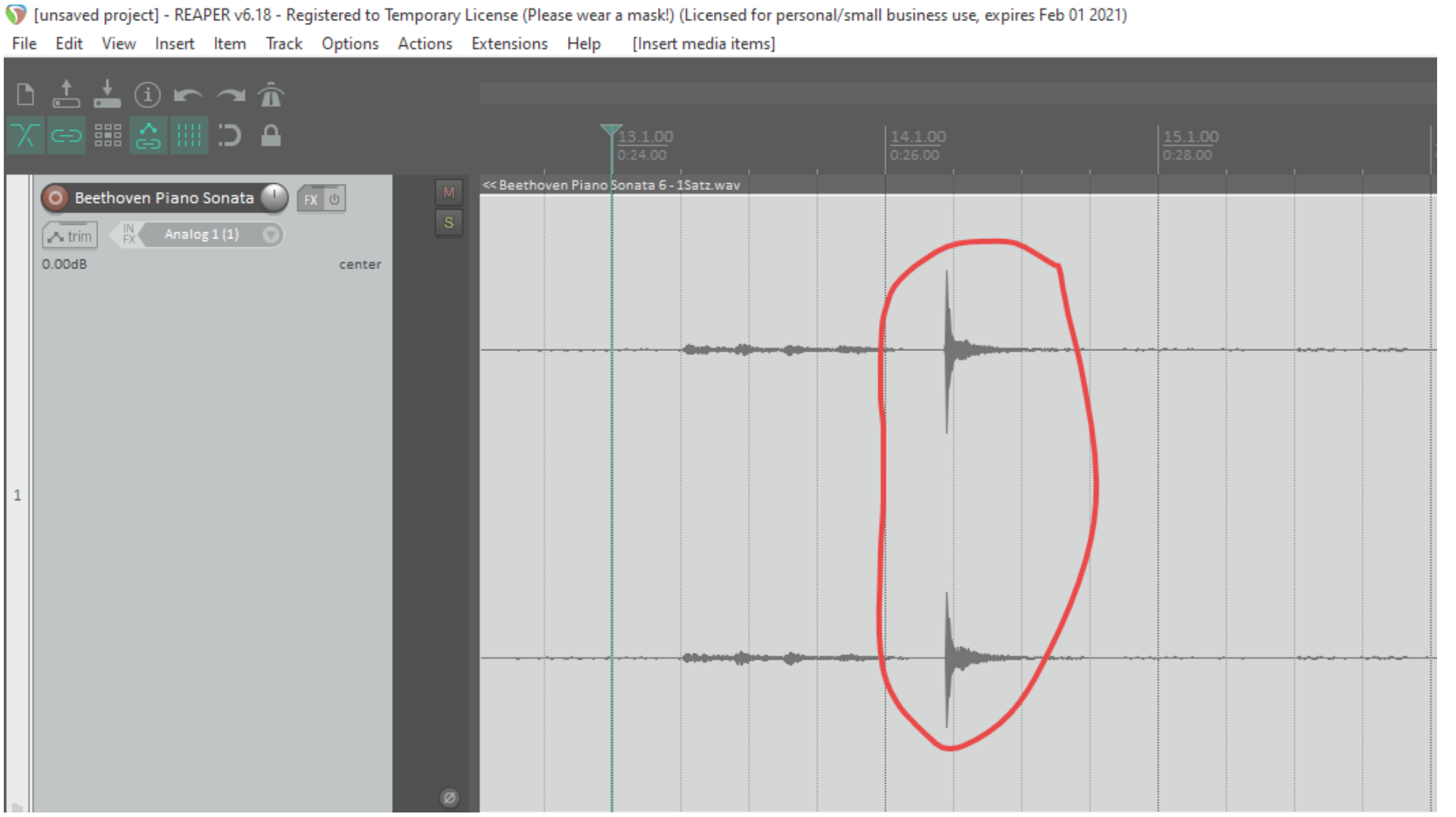
Without going into too much technical detail, the sample rate defines how often your AD-Converter checks the analog voltage of your input signal and converts that into a discrete, digital value. If there is a mismatch of sample rate (i.e. audio at 44100Hz) while the video codec requires 48000Hz), your recording will either out of sync with the video or played back at a lower pitch (as 44100Hz needs to be restretched to 48000Hz). There are high-quality sample rate conversions available to make it still work, but it's best to record at the correct sample rate.

Syncing Clap

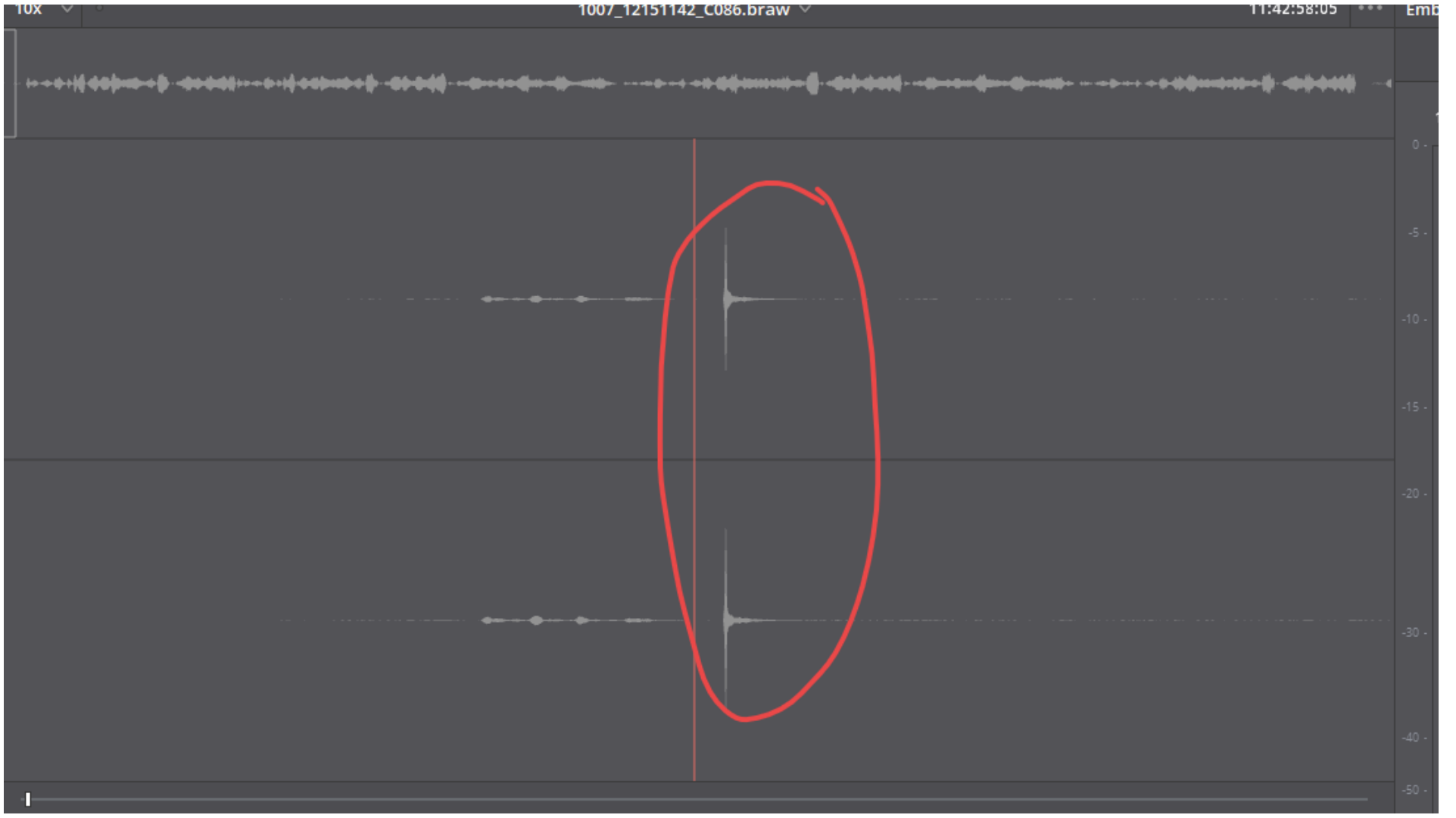
Now, set up your recording situation as you learned in the previous workshops! You can use as many microphones as you want since everything will be bounced to a single stereo file which we will add to our video in an NLE (nonlinear editor) like Blackmagic Design's Davinci Resolve, but more on that later!

Before you start to play, it's best to clap once visibly and audibly for your video camera and your microphones. This way, we have a visible peak to sync our video with our audio.

In the following recording of a Piano Sonata by Beethoven, I said into the microphone "Beethoven Piano Sonata No.5, Take Two" and then I clapped (red circle). It's a distinctive mark that will be visible both in the audio and in the video. Make sure that your video camera or smartphone is also recording audio! To be on the safe side, I always clap so that I can see my hands coming together in the video frame. This way I can still sync the audio with the video of my hands if there's a malfunction.



Audio recorded in Reaper



Audio recorded in the camera (viewed in Davinci Resolve)

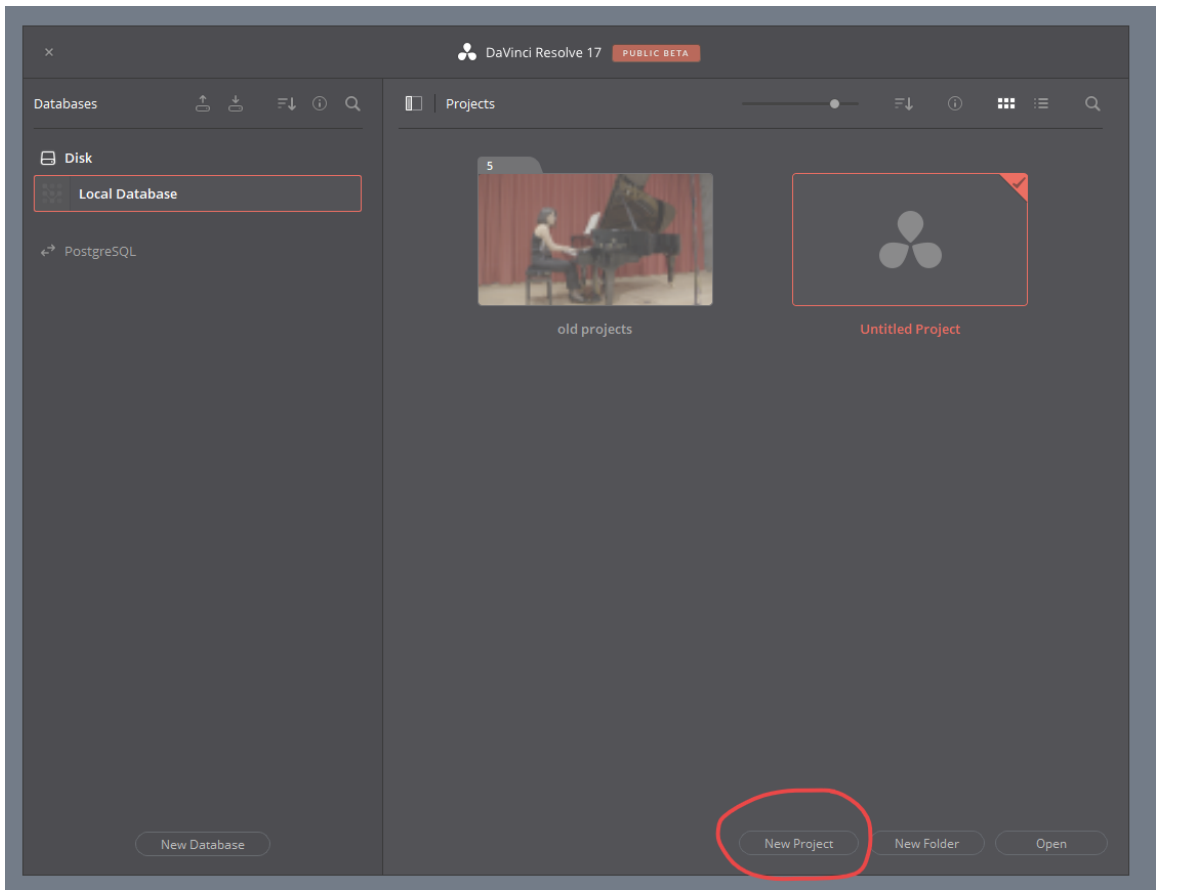
Now let us take our first look into **Blackmagic Design's Davinci Resolve**!

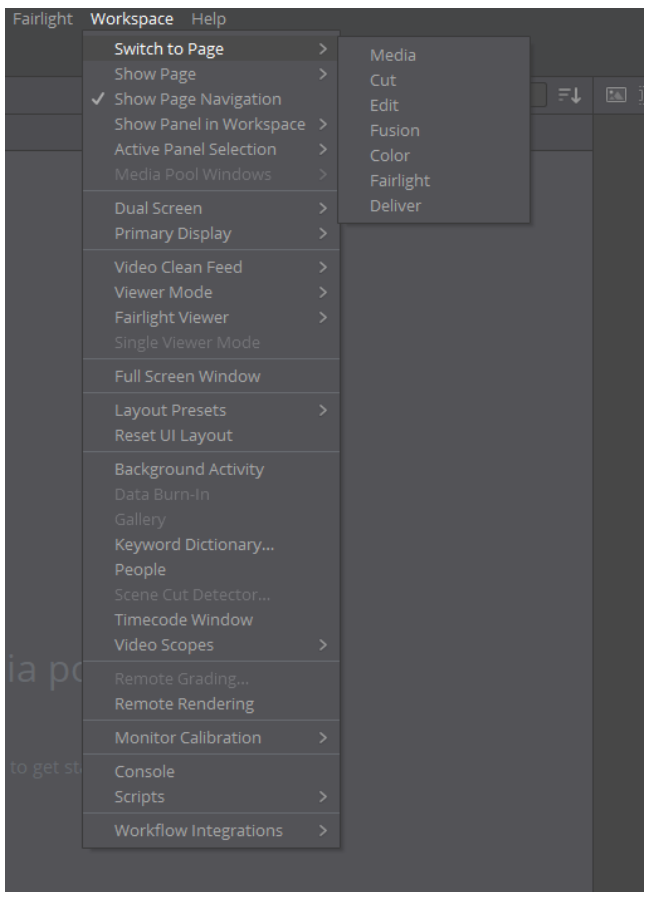
Davinci Resolve - Syncing

Davinci Resolve is the standard software for color correction, but with Version 14 they implemented editing capabilities, making it a complete solution for video post-production. Best of all: it is free to use if you can do without 4k! (and even then it's quite inexpensive and you are not tied to a recurring payment). The workflow from here on is the same for any NLE, so if you already own another piece of software like Adobe Premiere, Apple Final Cut, or iMovie, the steps should be very similar.

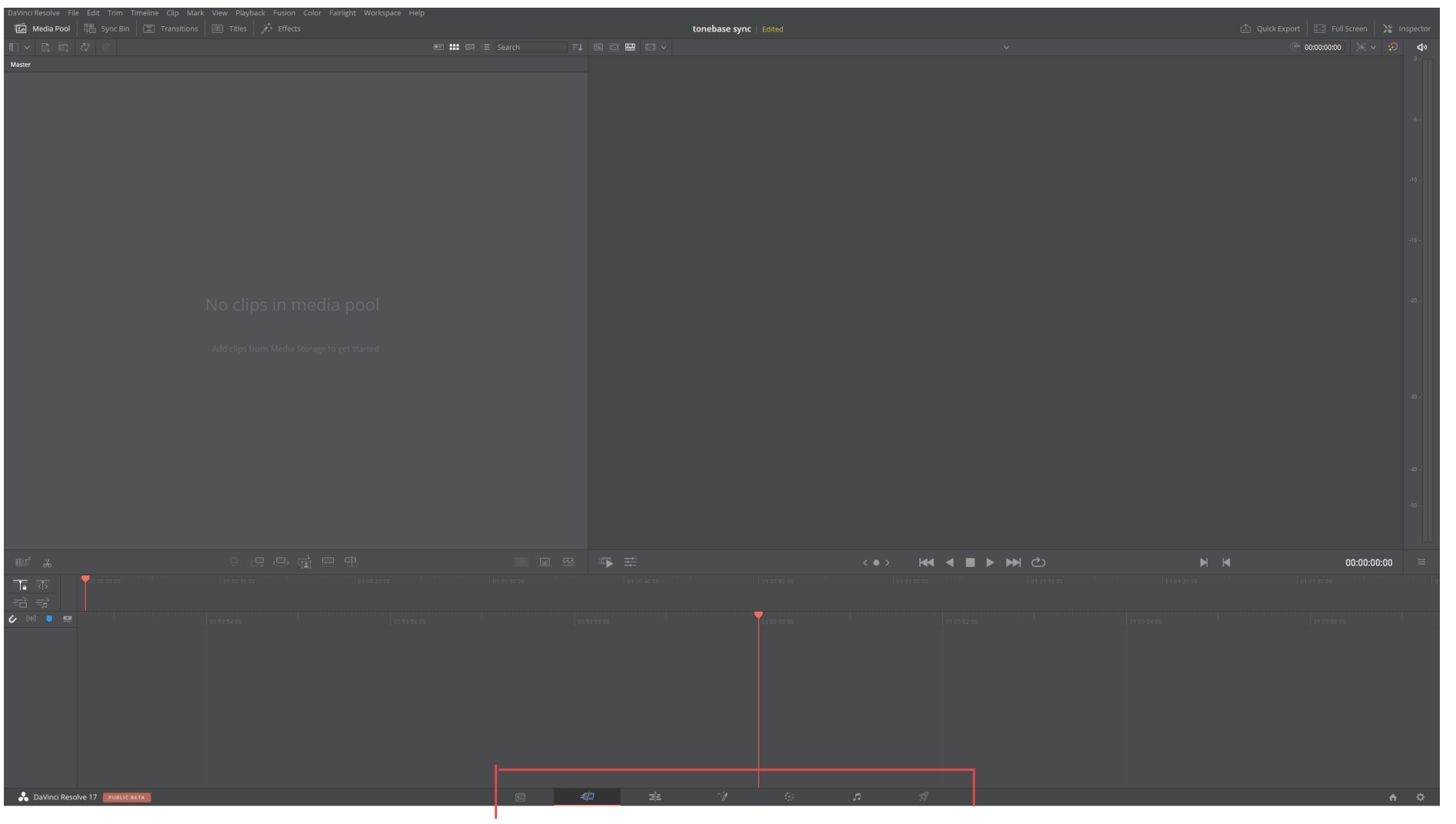
If you've already recorded your video and audio, let's open up Davinci Resolve!

First, you will be greeted by the opening window, where you can open a new project via the button "New Project" and name it accordingly. I will call my project "tonebase sync" for now.

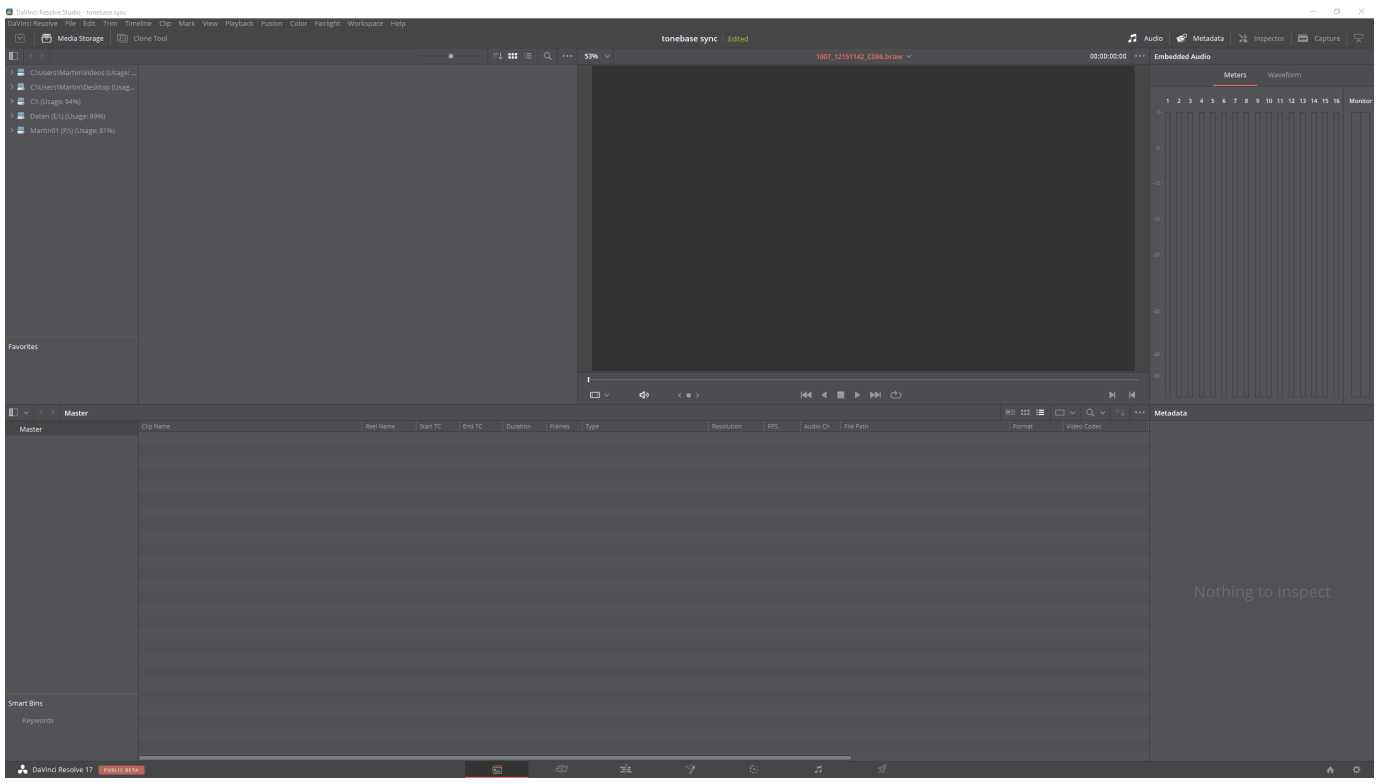




After that, you find yourself in one of the seven workspaces of Davinci Resolve. We will only need three of them: Media, Edit, and Deliver. You can change them either by the buttons on the bottom of the page or by navigating to **Workspace → Switch to Page**

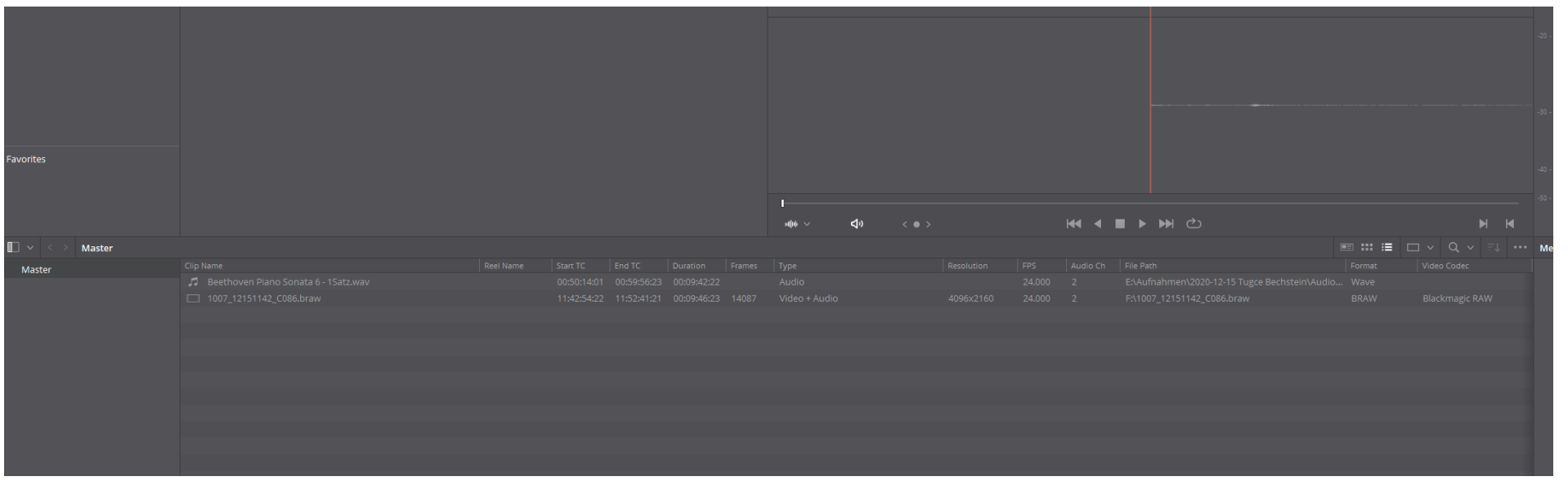


Let’s switch to the **Media** page, the first of the seven workspaces!



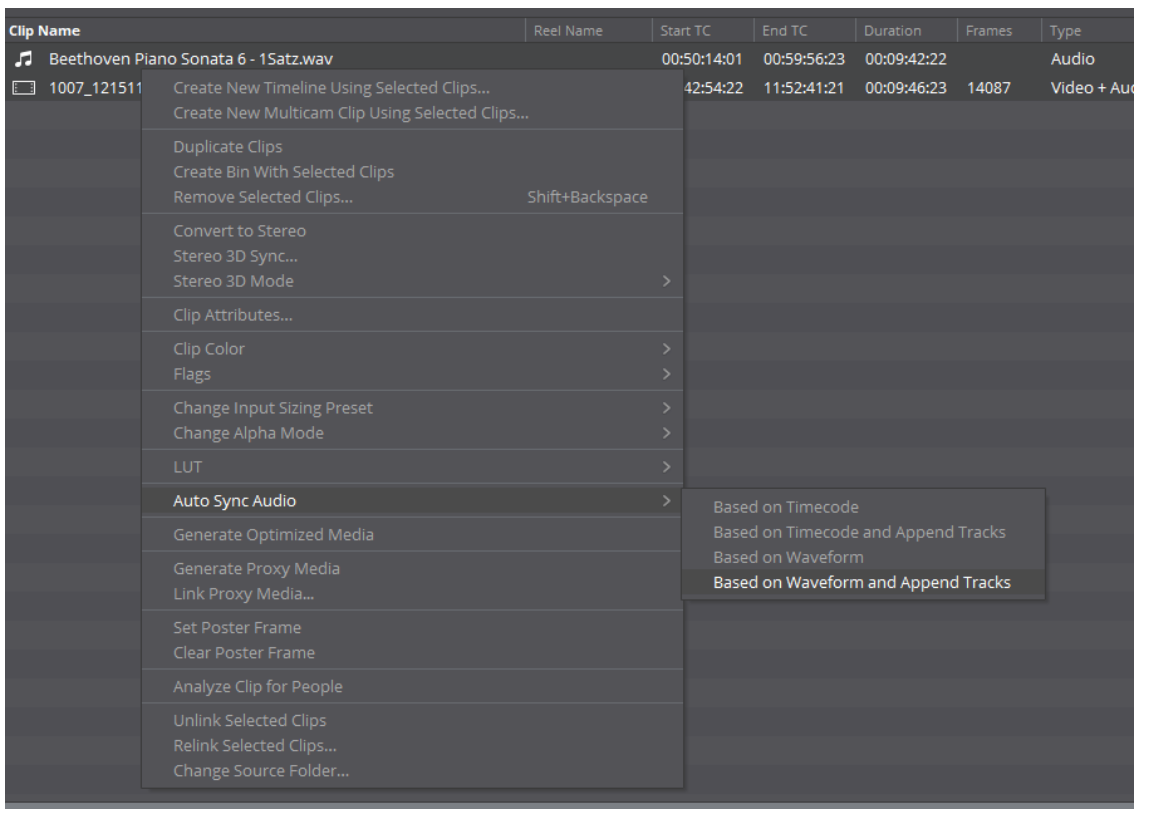
This is your hub for all of your audio material and footage! The easiest way to import your files is to drag-and-drop them from your file viewer onto the workspace. Let’s import our separate audio and video files.

As soon as you drop them there, they appear in the lower half of your screen in the **Media Pool.**

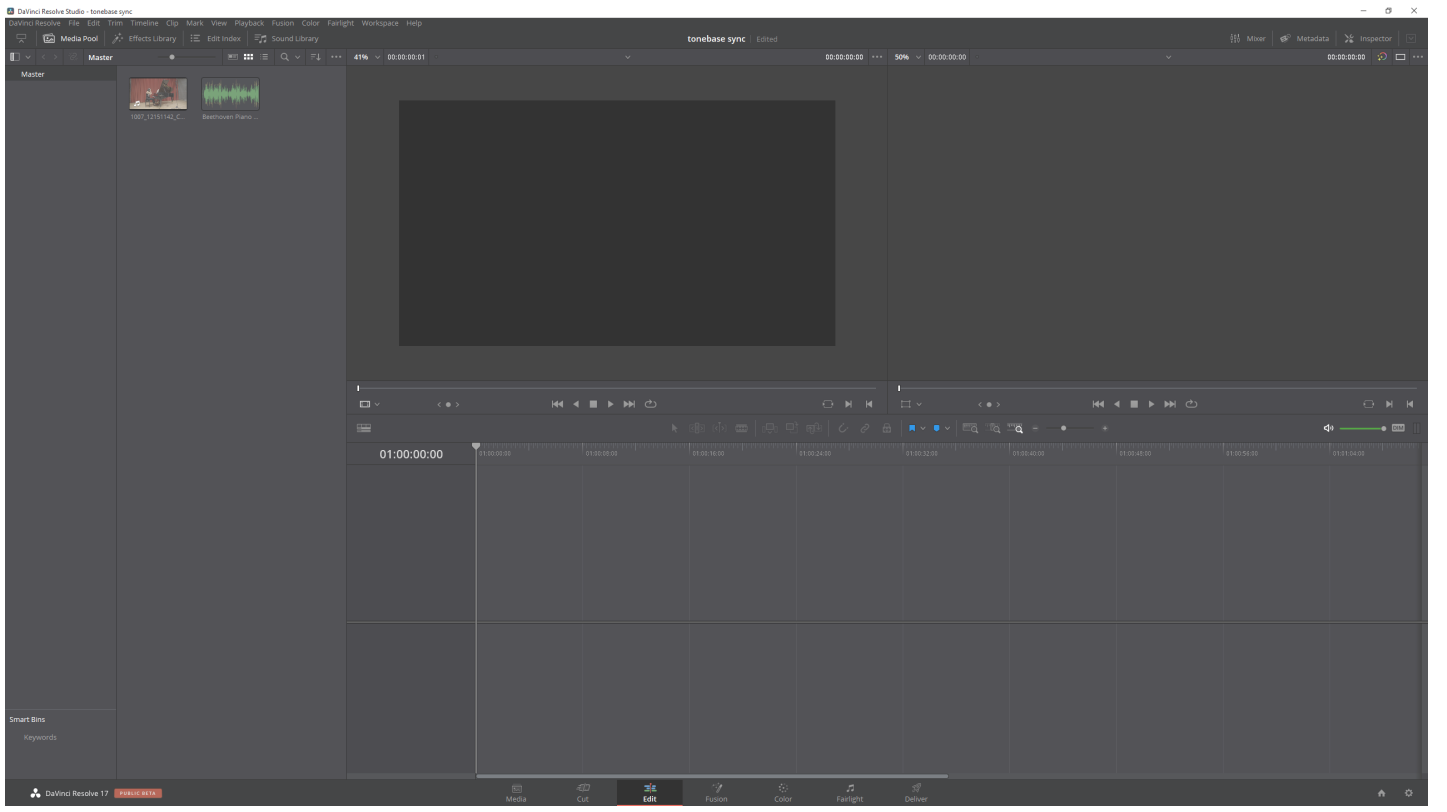


There are several ways to go from there: with a little bit of luck, we can use the Audio Auto Sync feature which automates the process for us. If you didn't go too crazy on your audio post-production, this a perfectly fine way to sync your files.

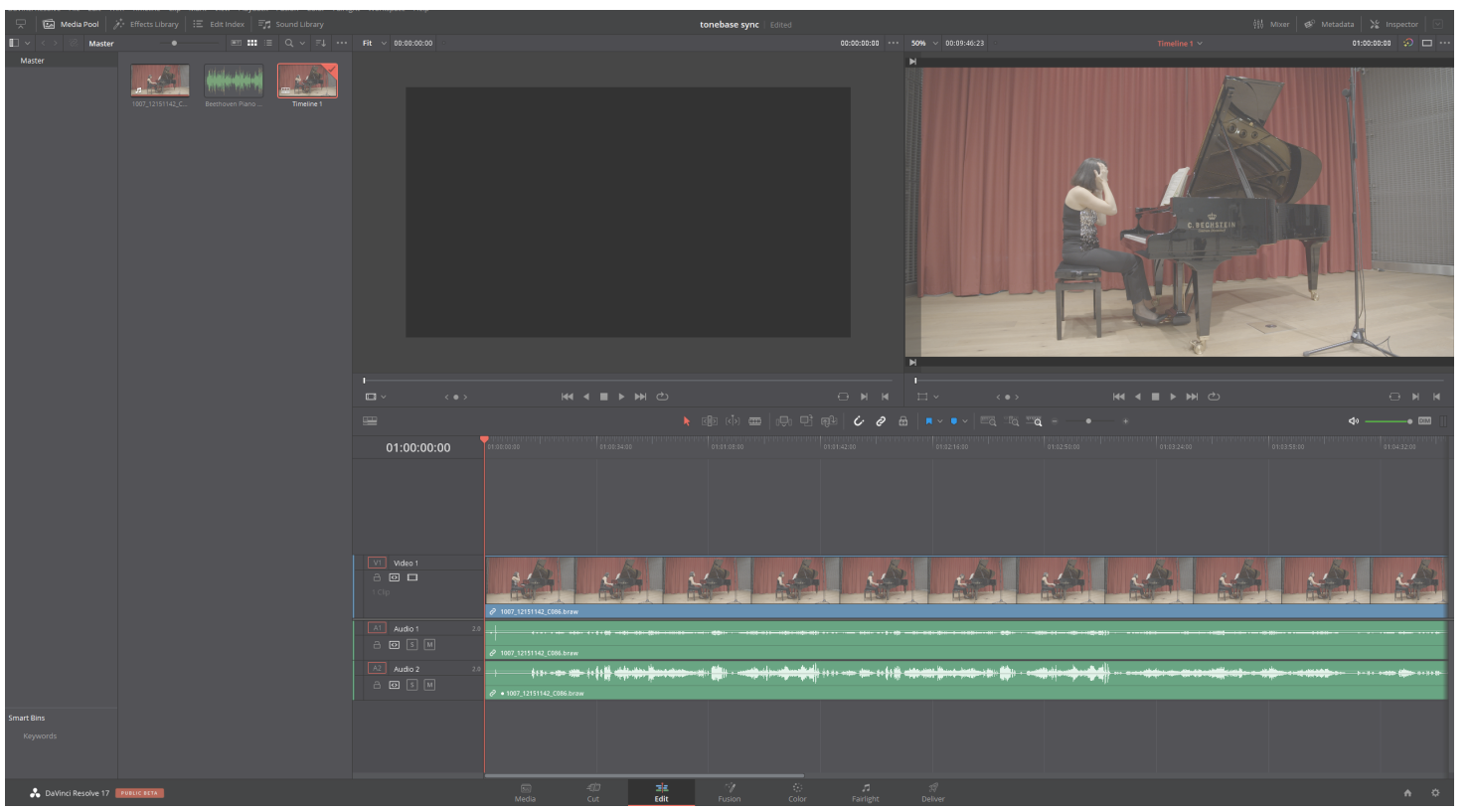
Simply select both of your files in the Media Pool, right-click, hover over **“Auto Sync Audio”** and select "**Based on Waveform and Append Tracks**". The new audio file should be appended to the video. This way, we ensure maximum flexibility in case something doesn't line up.



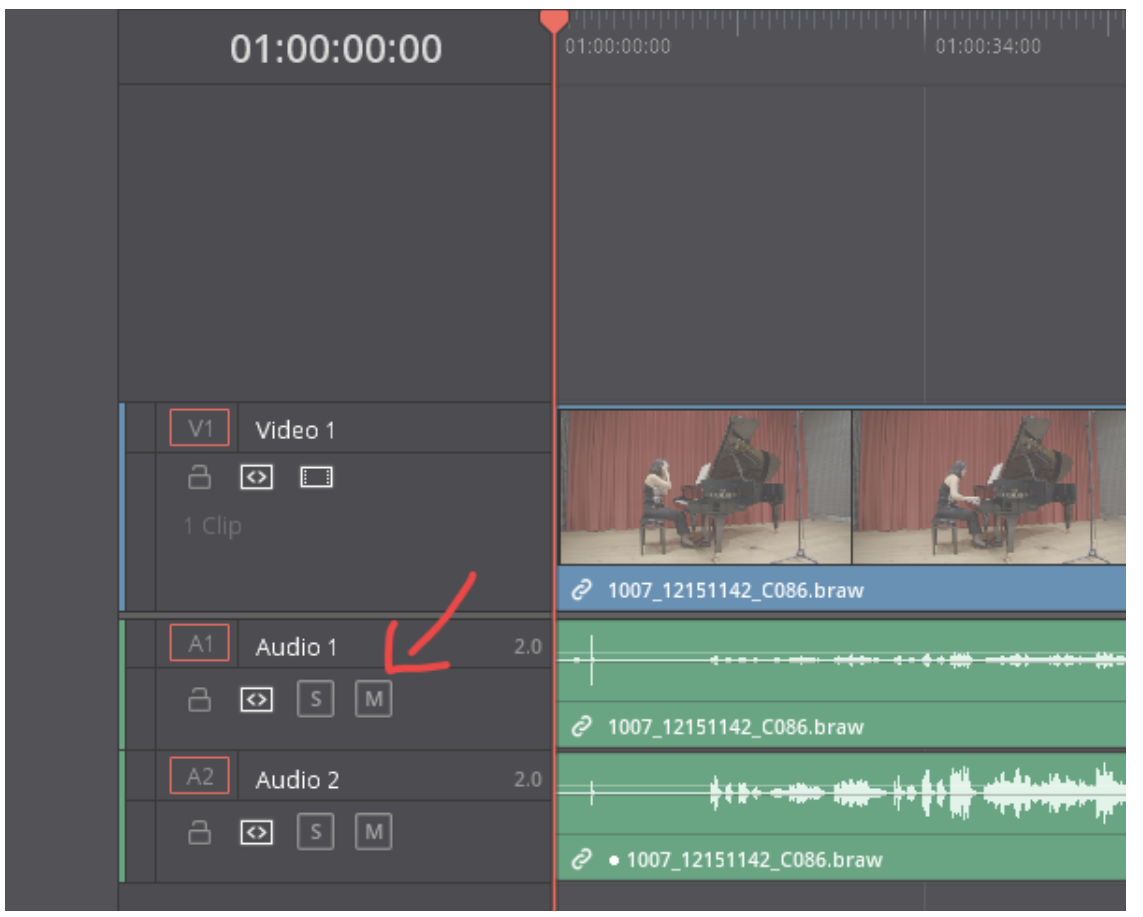
After some processing time, your Media Pool doesn't look any different. If you switch over to the **Edit** Page the same way we selected the Media Page, we will see the difference.



On the left side of the window, you'll find all the footage you've imported. Select your video file and drag and drop it onto the timeline. Your video track should have two audio files appended: the original audio feed from the camera and the newly appended audio track we synced in the Media Page!



You can listen to both audio tracks individually by muting one of the tracks in the timeline with the "M" button.



You may notice in the picture that the claps have been *perfectly lined up*!

Be aware that every audio edit you make in Reaper will cause the audio and video to be out of sync. To ensure video synchronicity, we need to use a technique called the 3-Point-Edit. I will demonstrate the basics of that live in the workshop.

If the Audio Auto Sync doesn't work, we'll need to sync our files manually. Click back to the **Media** Page and let's get a fresh start.

Select your audio file. You will see the waveform appear in the **Media Viewer**. Navigate to the beginning of your track, where you clapped. Use these keyboard shortcuts to navigate your file more easily:

Keyboard shortcuts

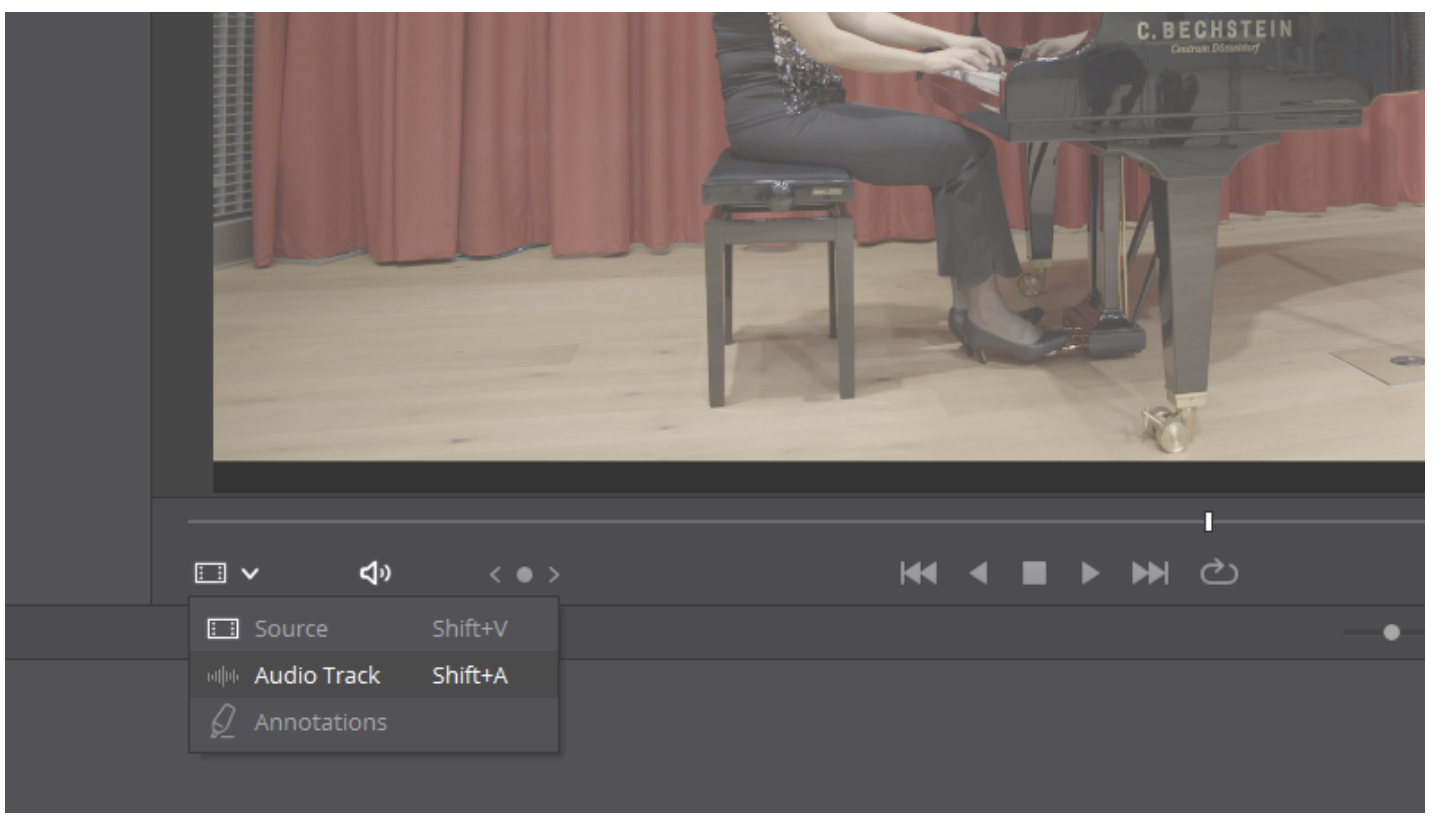
J - plays the file backward

K - pauses the file

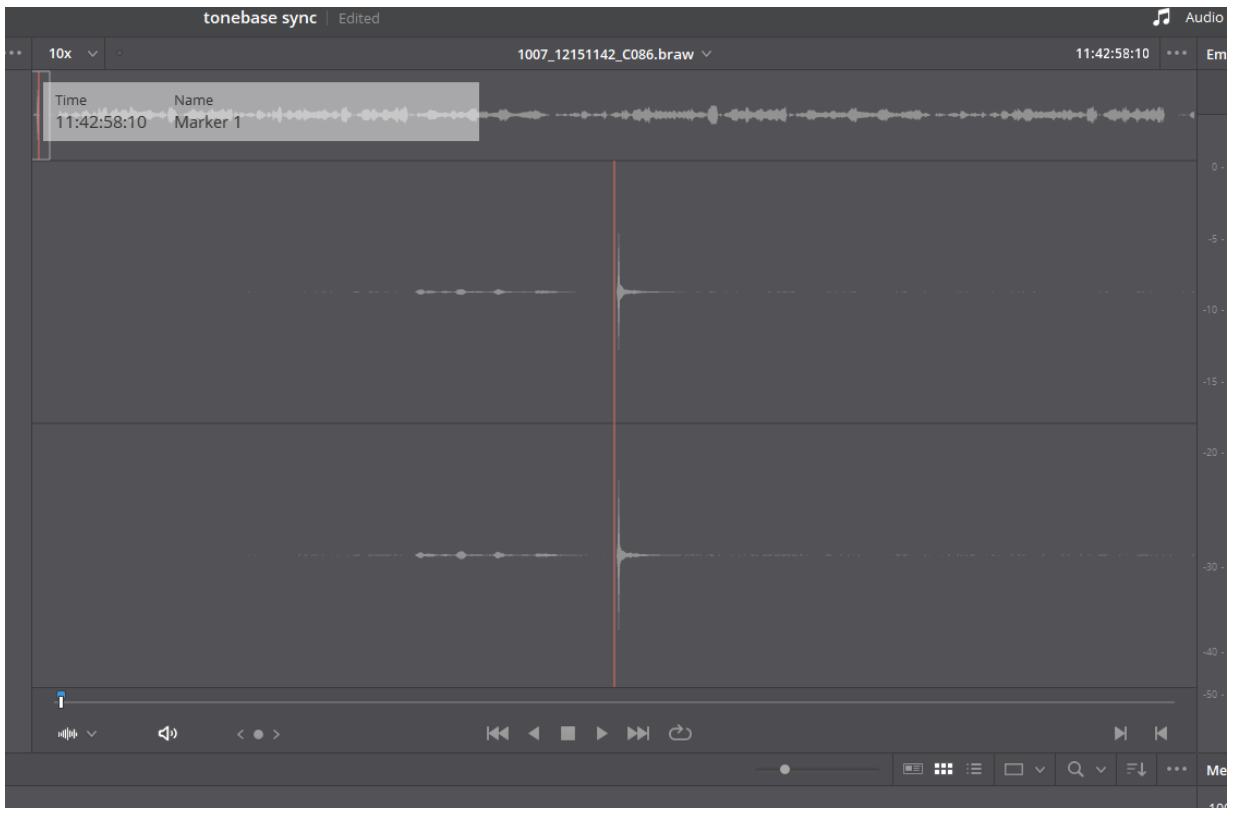
L - plays the file forward

Additionally, if you hit J or K multiple times, it will accelerate the payback, and if you hit K and L together (holding down K while tapping on L or J), you can move frame by frame through your footage.

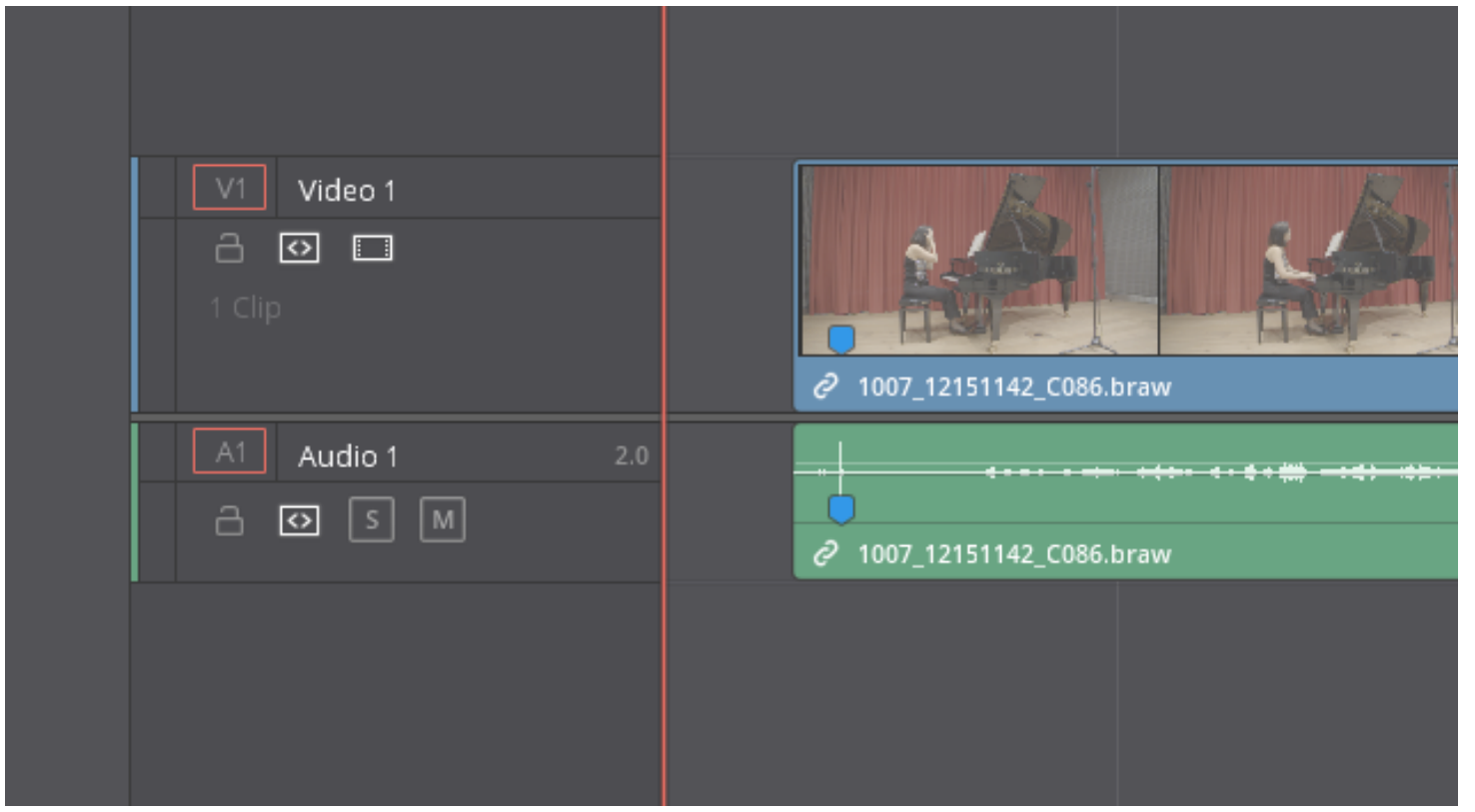
Navigate right to the beginning of your clip (you will see the audio metering jump once you hit the beginning of the clip). Now hit "M" to create a marker. This will help us line up the footage in the timeline. Next, do the same thing with the video file. You can also view the video in waveform format, making it easy to spot the peak of the clap. Go to the bottom of the Media Viewer and press the button that looks like an old film tape. Then select **"Audio Track".**



Repeat the previous steps to add a marker at the peak of your clap!

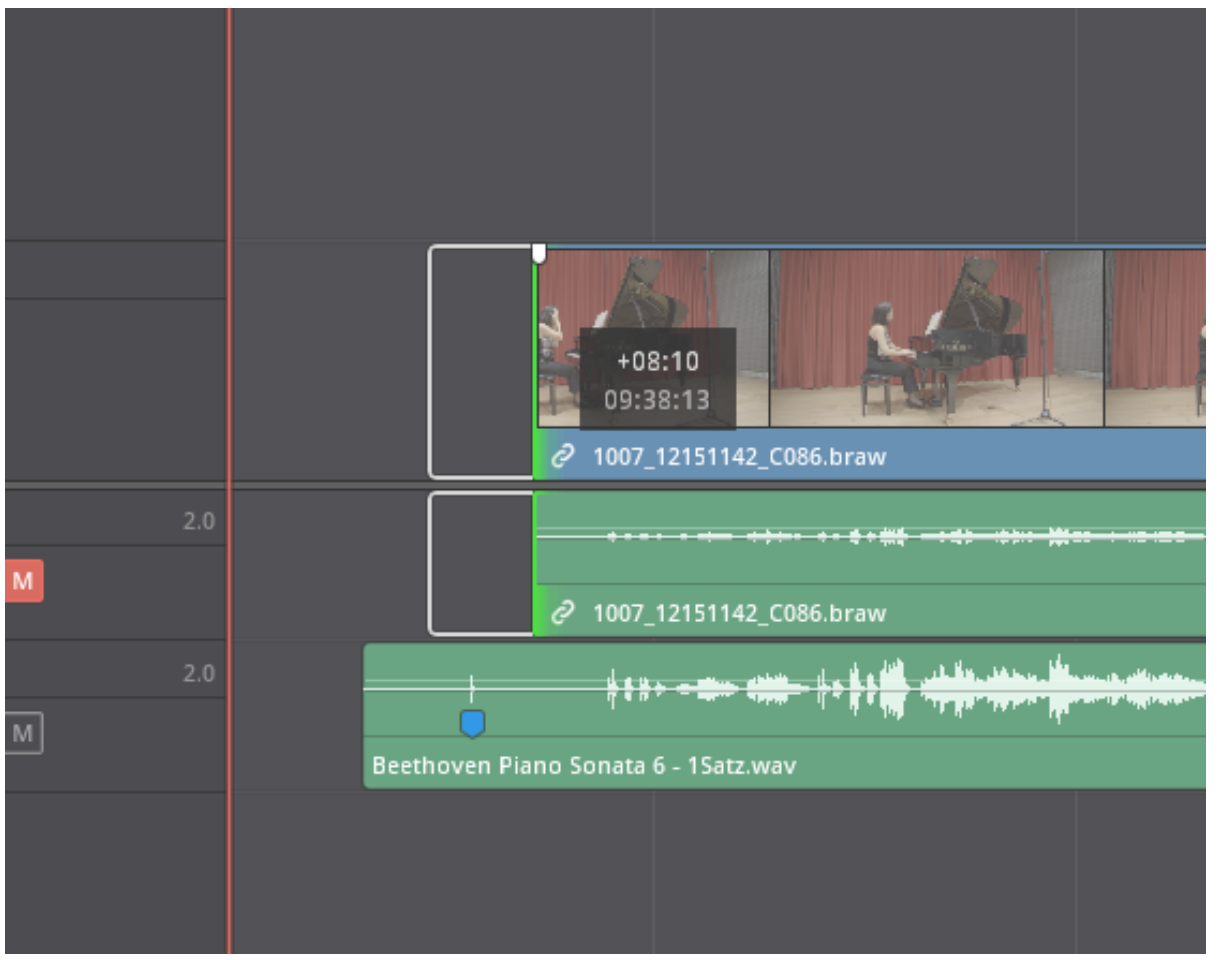


Go back to the **Edit** page. Here, we can put the video onto the timeline. You should already be able to see a colored flag where we added our marker.



Next, add your audio file to the timeline. You should see a flag at the point of your marker. If you move the two files closer together, the flags should snap together, aligning the two files. If the clips aren't snapping, click the magnet over the timeline to activate snapping.

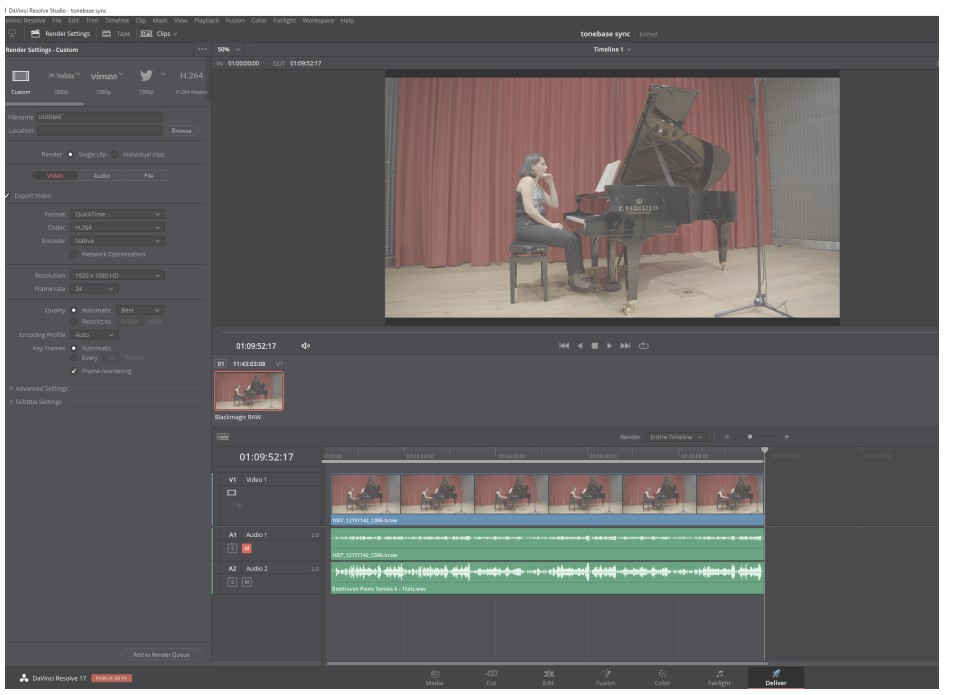
Now we'll work with our footage the same way we worked with our audio in Reaper. First, mute the audio track from your camera by clicking on the audio track and hitting M. Second, we don't need to see or hear the clap anymore, so let's remove it. Click and drag on the edges of the track to trim it.



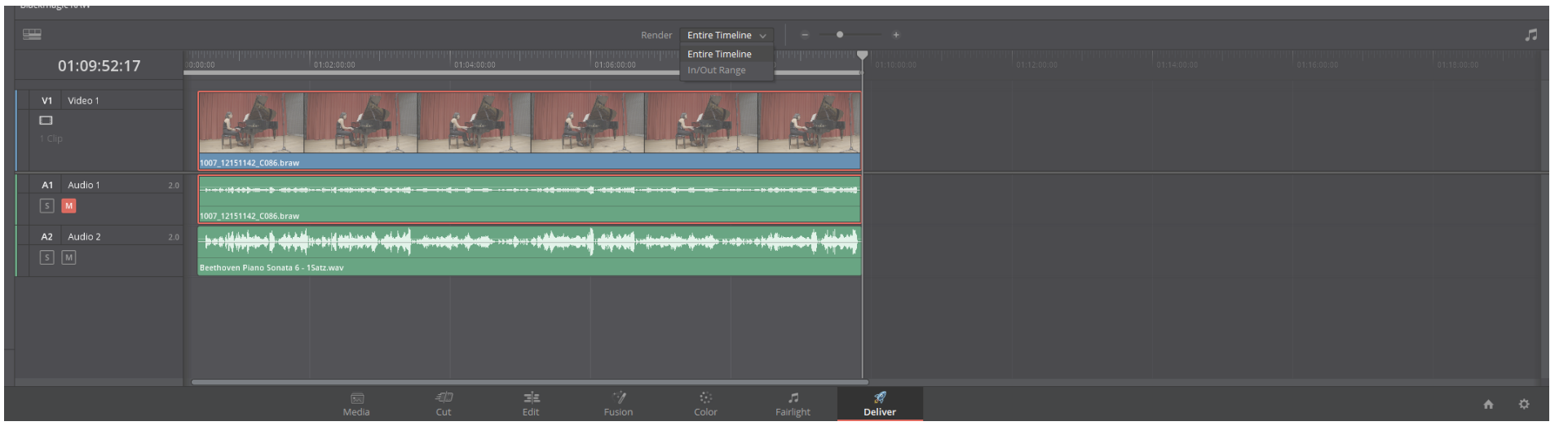
Once you're happy with the beginning and end of your video, we can move over to the Deliver Page. Just click the last button on the bottom of the page or navigate by clicking **Workspace → Switch to Page → Deliver**.

Exporting

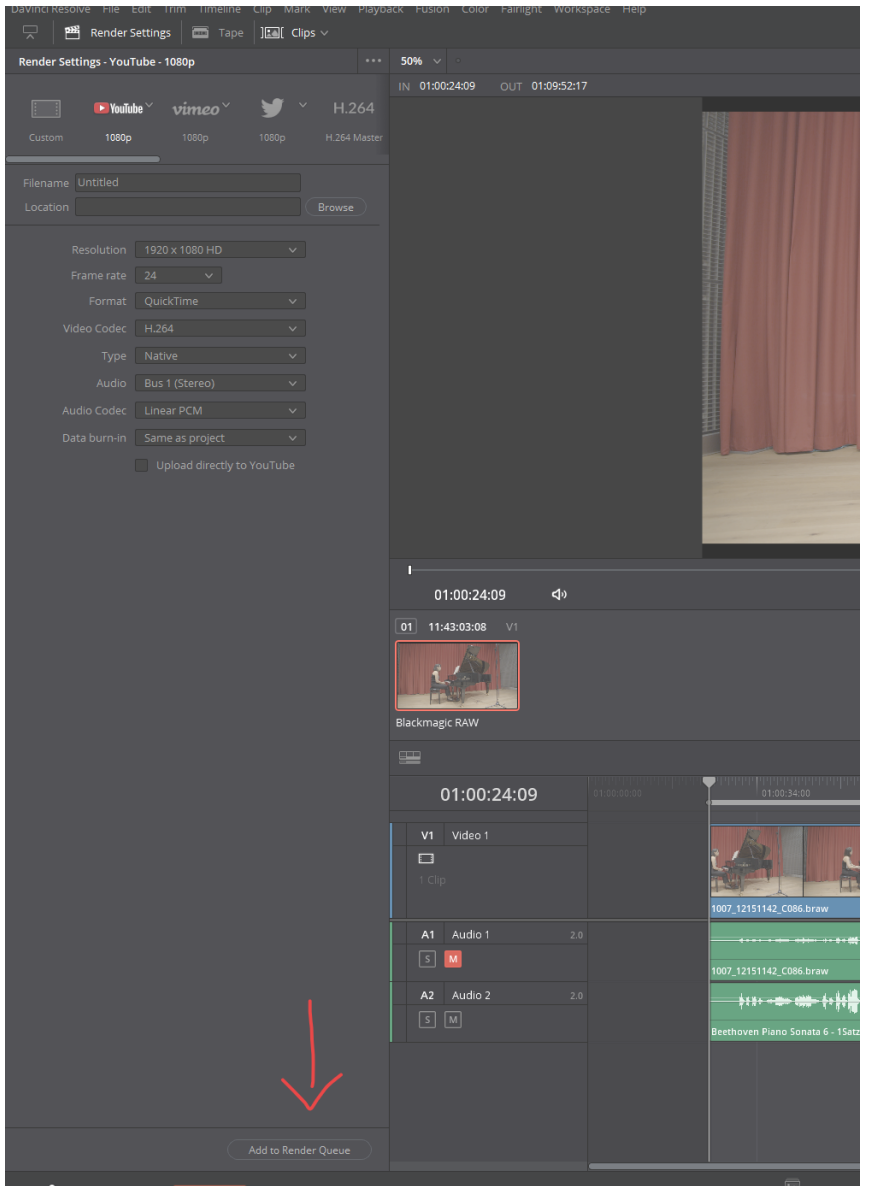
Let's export our video by using a render preset on the left side of the screen. Select the "YouTube" Preset, which is suitable for most applications and distribution formats. Give the file a name and a destination on your hard drive.



Next, we need to select the area of your timeline that should be rendered. I usually like to make my selection via the "In/Out Range". Go to the top of your timeline and select **Render → In/Out Range**. Now go to the beginning of your clip and hit the keyboard key "I". This will create the **In-Point**. Do the same with the ending, hitting “O” this time, to create the **Out-Point**. These two points tell the program what to export.



Let's get ready to export our files! If you are happy with the name, the location, and the range, you can hit **Add to Render Queue** on the bottom left of the page.



If you haven't defined a location yet, you will be prompted to select one. Your project has been added to the Render Queue on the right side. The queue allows you to create multiple render jobs at once, either in multiple formats or with multiple ranges.
By clicking **Render All**, your computer will start to work through the render queue one at a time! Once a job is done, you can left-click on the render job to open the file location, playback the file with your media player of choice, or upload the file to the tonebase forum!

Conclusion

Thank you for taking part in the tonebase Recording Academy. The goal of this course was to provide an overview of high-quality audio and video recording. We explored the wonders of audio editing and post-production, learned how to properly and objectively listen to audio, and dipped into the world of video recording and editing.

The next steps are up to you! Continue trying to improve the quality of your recordings. Experiment with different mic setups and try implementing the various audio tools we learned how to use. Feel free to use the dedicated forum to ask questions, post your recordings and get more feedback from your fellow tonebase users!

We will return with more basic tutorials on recording and with more advanced subjects. Let us know if there is another audio-based topic you want us to cover in the forums!

Assignment

- ○ Record yourself with audio and video (without edits in Reaper)

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CLICK TO VISIT THE FORUM THREAD FOR WEEK 5

CLICK TO REVIEW THE RULES AND FAQ

Questions

Use the questions below as a chance to reflect on how far you've come with your progress on the topic of home recording and use the dedicated forum thread to post questions or discuss topics of this workshop.

1. What sample rate should you choose for recording yourself with video?

2. Do you actually need a clap to sync your audio? Elaborate (think about different instruments as well).

3. What could happen if you try to sync a video with an audio file that has been assembled from different takes? (tip: Think about lining up bar after bar vs. inserting a bar into an existing take!)

4. Is there a way to monitor and avoid this problem?

About Your Instructor: Martin Zimny

Martin Zimny, born in 1988 in Munich, Germany, graduated with a Master's of Music from the Robert Schumann Hochschule in Düsseldorf, Germany with Cuban guitarist Joaquín Clerch. He has won prizes in several national and international competitions and played concerts across Europe and India. He has taken part in festivals and workshops in Austria, Germany, Spain, the Netherlands, and Serbia. Martin has been working as a guitar instructor for almost 10 years. After his degree in music, he studied Engineering for Audio and Video at the University of Applied Sciences in Düsseldorf. Today, he continues to perform and teach while working as a professional recording engineer.

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Notes