Audio Mapping in Cambria FTC

MANUAL

AUDIO MAPPING - USER GUIDE

I. INTRODUCTION

This document will introduce you to Cambria FTC's audio mapping interface, and teach you how to accomplish common audio-related tasks, and fix common audio-related problems. Let's start with an introduction to channels and tracks.

A. Channels and Tracks

Understanding what channels and tracks are and how they are different is critical to using Cambria FTC's audio mapping capabilities, and producing audio in any program.

1. Channels and Tracks

Understanding the difference between channels and tracks is most easily understood using the concept of surround sound, as shown in Figure 1. Briefly, surround sound is comprised of six separate *channels* of audio representing positions around the viewer. Each channels contains a single representation of audio.
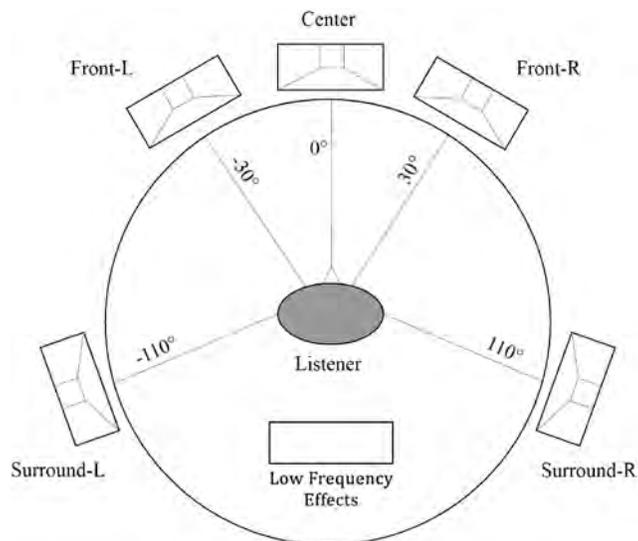
Figure 1. Channels in a sound sound signal.

Tracks are containers for these channels, whether for one or multiple channels. For example, the surround channels shown in Figure 1 could be contained in six different tracks, or a single 5.1 surround sound track. Alternatively, if you mixed the surround sound into stereo for streaming, a common task, you could place the left and right channels in separate tracks, or a single track with left and right channels.

## 2.	Common Mapping Conventions

When you're producing audio for playback on specific target devices, it's critical to follow common mapping conventions. This is shown in Figure 2, which is the Audio Track Assignment dialog from Cambria's Audio Track Mapping function. As you can see, this shows a single track with six channels. Channel 1 in that track is the left channel, channel 2 the right channel, 3 the center channel, and so on.
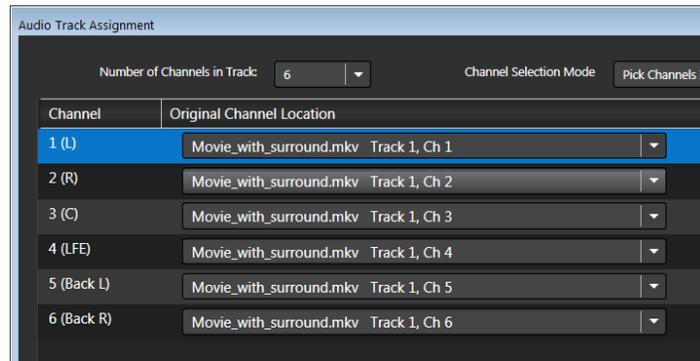
Figure 2. Common mapping convention for surround sound.

When a track is properly formulated in this way, all channels play correctly on 5.1 surround systems, and stereo-only systems know which tracks to play. So when creating tracks with Cambria's Audio Track Mapping function, it's critical to follow these mapping conventions.

Unfortunately, when saving source files with multiple channels or tracks, video producers often don't adhere to these standards. For example, for audio files with multiple languages, it's common to include English left/right in the first two channels, then a second language left/right as channels 3/4, then a third language as channels 5/6. So when you're working with files with non-standard placement, job one is determining exactly what's contained in all the tracks and channels in the source file.

As you'll see, Cambria has powerful tools for mapping tracks to correct outputs for final rendering, and can automate these functions within the interface or via watch folders. But the part that Cambria can't do is identify which channels are where. This is entirely up to you.

How to do this? It's best to ask whoever output the video file to identify the various channels and tracks in the associated audio files. Failing that, you may have to input the audio tracks into an audio editor, and listen to the separate channels to identify them, or perhaps use a player like VLC player to isolate and identify the separate channels.

## 3.	What You'll Learn in this Manual

This manual will first introduce you to the various dialogs and features in Cambria's Audio Mapping Function. Then you'll learn how to address these common problems and scenarios.

- Fix incorrect mappings
- Create separate tracks for streaming (stereo, surround)
- Separate multiple languages into separate files
- Change mappings (Surround to stereo, stereo to mono)
- Add/replace tracks in video file

II.   WORKING WITH AUDIO IN CAMBRIA

Here's the general workflow for working with audio in Cambria.

A.   Workflow Overview

You'll start in the Source tab, working in the Audio Track Mapping function (Figure 3). Here you'll fix any problems, create separate tracks, swap out audio files, or perform other functions. When you'll need to perform the operation repetitively, you can save an audio audio track map preset with a .cfma extension for re-use within the Cambria or in the Watch Folder interface.
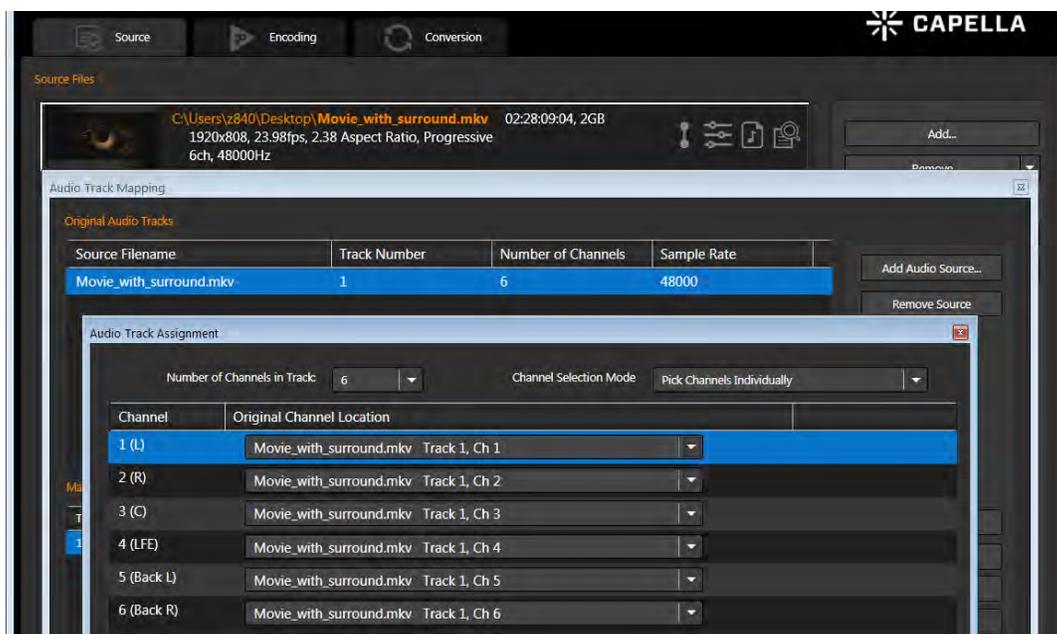
Figure 3. Working in the Audio Track Mapping function.

Once you finalize your audio mapping, you have to have to identify your tracks and specify their encoding parameters in your encoding preset (Figure 4). In the top of the preset you'll identify how many audio tracks are in the file, and their composition and encoding. On the bottom of the preset (not shown here, but shown later), you'll set the encoding parameters for your tracks. As with the audio mapping presets, if you'll be encoding your audio files repetitively in a consistent manner, you can save a custom encoding preset to simplify operation in the Cambria interface, or automate operation in a Watch folder.
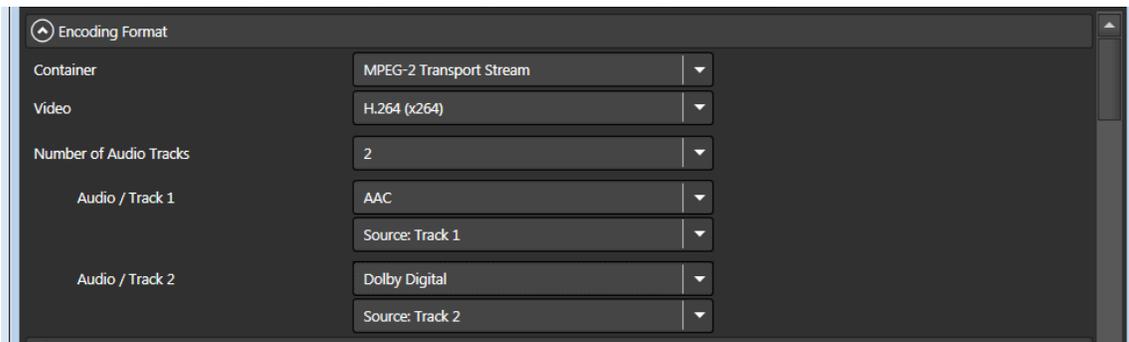
Figure 4. Designating your tracks in the Preset Editor.

When performing repetitive operations within Cambria, you can load the auto audio track map and apply it to multiple files by clicking the Auto Audio Track Map button shown on the bottom right of Figure 5.
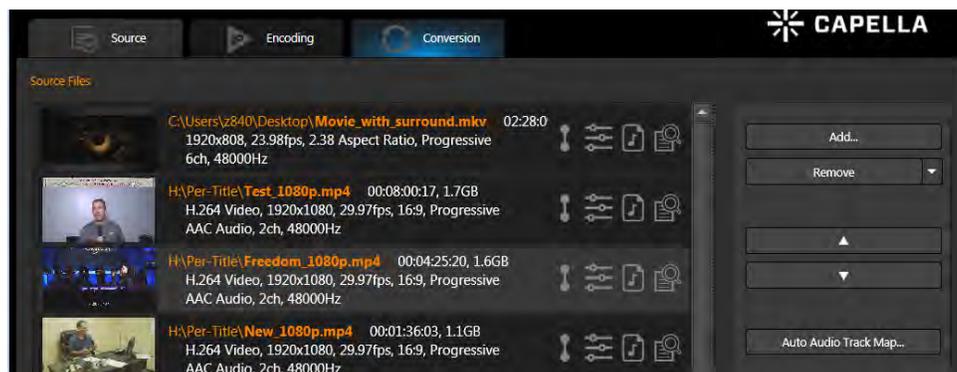
Figure 5. Applying an auto audio track map to multiple files in Cambria.

To deploy the auto audio track map in a Watch folder, you can add them to the Conditional Audio Mapping dialog shown in Figure 6. You can load multiple track maps, and during operation, Cambria will apply a map to the first file that matches the source audio configuration.
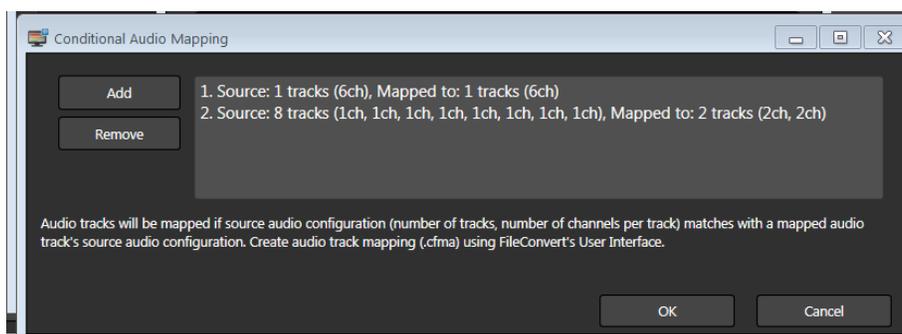

Figure 6. Applying an auto audio track map to a watch folder.

B. Working in the Audio Track Mapping Dialog

That's the background. Now you're ready to start work in the Audio Track Mapping dialog. Before getting started, however, let's take the critical first step.

1. Before Getting Started - Identify Your Audio Channels

As discussed above, the critical step Cambria can't perform for you is identifying the audio channels in your file. So whether it's by asking provider of the video, or experimenting in your audio editor, start by creating a list like that shown in Figure 7.

Track	Source	Channels	
1	Track #1 of Feature_Film.mxf	1 channel	Left Spanish
2	Track #2 of Feature_Film.mxf	1 channel	Right Spanish
3	Track #3 of Feature_Film.mxf	1 channel	Left English
4	Track #4 of Feature_Film.mxf	1 channel	Right English
5	Track #5 of Feature_Film.mxf	1 channel	Center
6	Track #6 of Feature_Film.mxf	1 channel	LFE
7	Track #7 of Feature_Film.mxf	1 channel	Back Left
8	Track #8 of Feature_Film.mxf	1 channel	Back Right

Figure 7. Identifying the channels in your audio file.

As you can see in the Figure, the first two tracks are left and right Spanish, the next two Left and Right English. In most surround mixes, dialog is constrained to two tracks, with all other audio channels containing effects, music, or other non-dialog. That way, it's simple to swap the dialog and create Spanish and English surround sound tracks.

Note also that the left and right dialog tracks contain only dialog, not a full left and right stereo mix. Though Cambria can create a stereo mix from the two language channels and four other surround channels, that operation is probably best done in a full sound editor. What we'll do with this file is create separate Spanish and English surround tracks, and swap out externally created stereo channels for both Spanish and English tracks.

2. Accessing the Audio Track Mapping Dialog

Follow these steps to open the Audio Track Mapping dialog.

a. In Cambria's Source tab, load the media file containing the audio into as normal.

b. In the Source tab, click the Mapped Audio icon to the right of the file name (Figure 8).
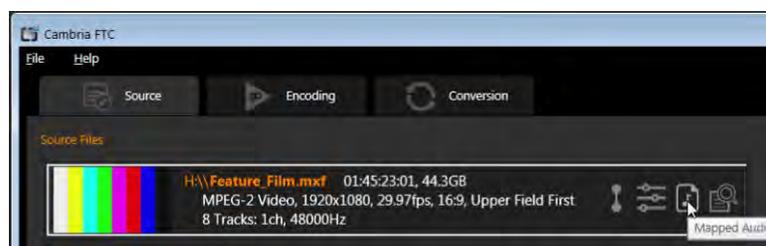
Figure 8. Opening the Audio Track Mapping dialog.

c.   Cambria opens the Audio Track Mapping dialog (Figure 9).
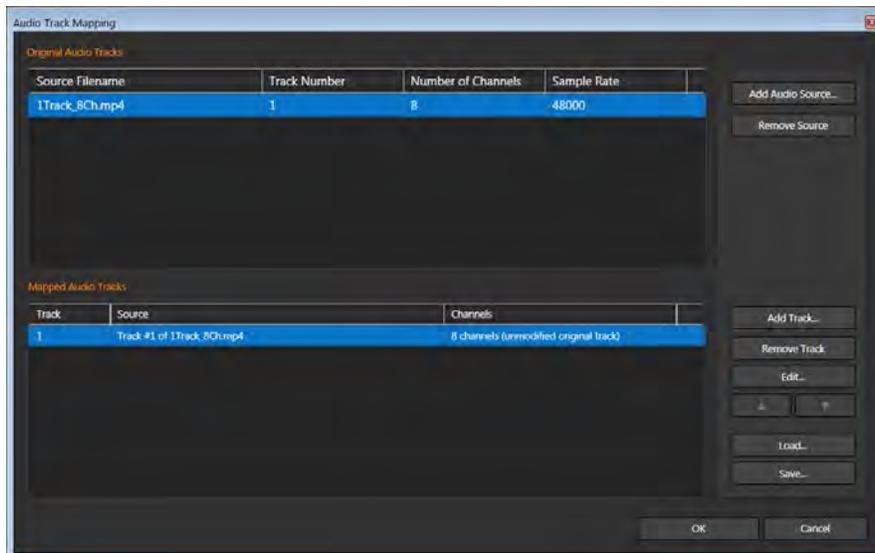

Figure 9. The Audio Track Mapping dialog; one track, eight channels.

Note that this dialog will look differently depending upon how your file is saved. For example, in Figure 9, the audio file contained one track with eight channels. To view the separate channels in the track, click to select the track in the bottom Mapped Audio Tracks window, and click Edit.

In Figure 10, the file contained eight tracks, each with a separate channel. In most instances, it doesn't matter how your audio file is constructed; you can get to the same place from any starting point.
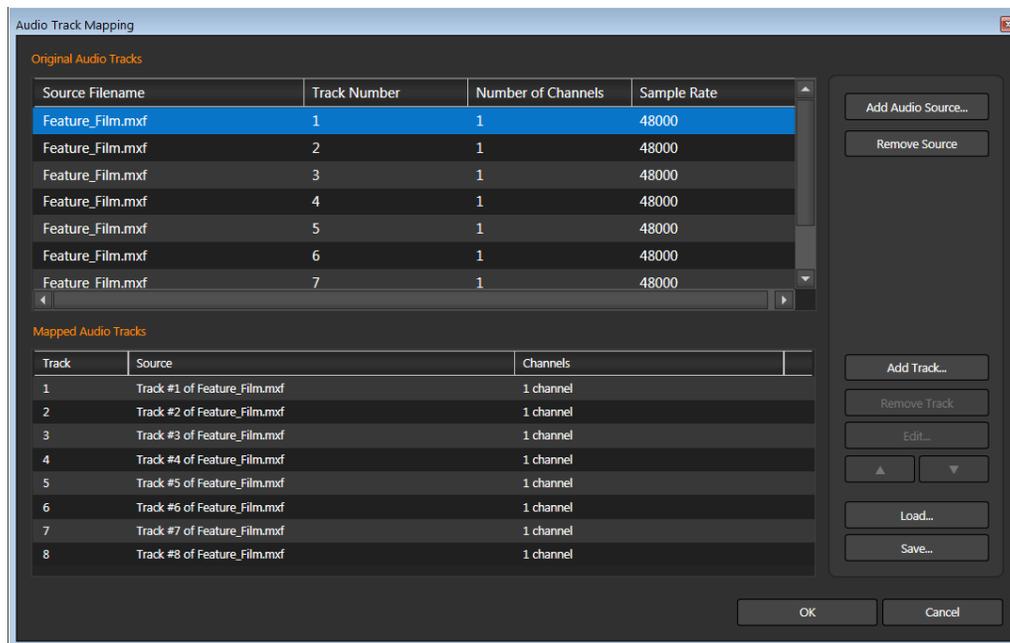
Figure 10. The Audio Track Mapping dialog; eight tracks, eight channels.

Let's take a quick tour around the Audio Track Mapping dialog.

Original Audio Tracks Window - This window contains the audio tracks in the original file and separate audio tracks you import to insert into the output. The Add Audio source allows you to add media files to integrate into the mix, while Remove Source removes those added files.

Mapped Audio Tracks Window - This window contains the tracks that will be output with the video file once you've completed your mapping. If you'll be creating all new tracks, it's easiest to simply select and delete all tracks using the Remove Track button.

Add Track button - This adds a new track to the Mapped Audio Tracks window and opens the Audio Track Assignment dialog (Figure 11). This is where you'll choose the number of channels in your track and choose the channels themselves. This is also the dialog that opens when you select a Track, and choose Edit.

Remove Track button - Click a track or tracks and click this button to remove them.

Edit - Click a track and click Edit to open the Audio Track Assignment dialog shown in Figure 11. This is the workflow you'll use to fix broken audio tracks.
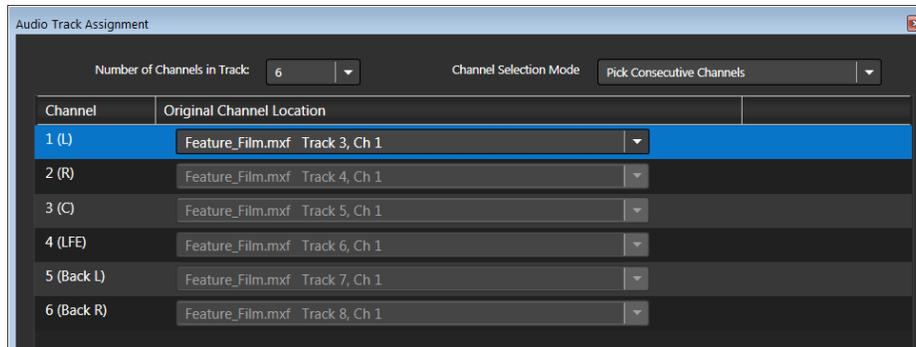
Figure 11. Here's where you choose the number of channels and channels in the track.

Up and Down arrows - Let you move from track to track in the bottom window.

Load/Save buttons - These buttons let you load and save Auto Audio Track maps with a .cfma extension.

3. Working in the Audio Track Mapping Interface

Your precise workflows will vary depending upon your starting point and project goals, but here are some common tasks most producers will frequently use.

a. Deleting all tracks

Sometimes you'll use tracks included with the original source file, but oftentimes not. If not, you should delete all tracks in the Mapped Audio Tracks window before starting to create tracks.

   i.   In the Mapped Audio Tracks window, click to select any track.

   ii.   On your keyboard, choose Ctrl-A to choose all tracks.

   iii.   On the right of the Audio Track Mapping dialog, choose Remove Track.
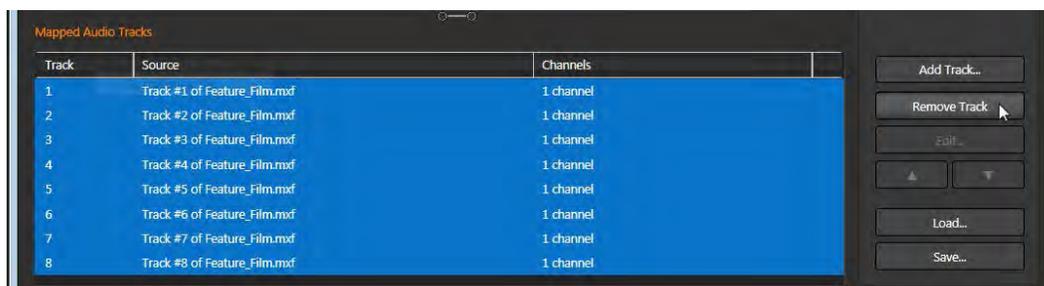
Figure 12. Removing all existing tracks.

b.   *Adding a Track*

This is one of the most common activities that you will perform.

    i.   **Add the track.** In the Audio Track Mapping dialog, click Add Track. Cambria opens the Audio Track Assignment dialog.

    ii.   **Choose the number of channels.** In the upper left of the Audio Track Assignment dialog, choose the number of channels in the track (Figure 13).
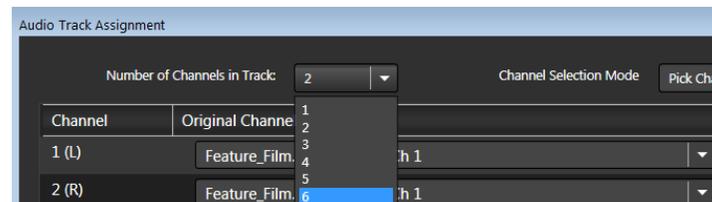

Figure 13. Choosing the number of channels in the track.

    iii.   **Choose the channel selection mode**. In the upper right of the Audio Track Assignment dialog, choose the Channel Selection Mode (Figure 14).

    -     If the channels you'll be selecting are consecutive, choose Pick Consecutive Channels. This will speed and simplify operation and help prevent errors.

    -     If you'll be selecting non-consecutive channels, choose Pick Channels Individually.
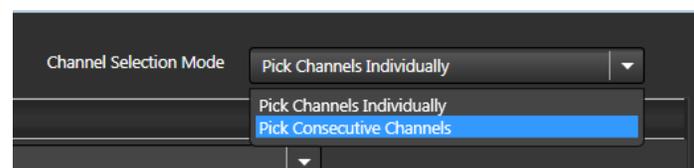
Figure 14. Choosing the channel selection mode.

    iv.   **Choose the channels in the audio track.** In Figure 15, we're creating an English Surround Sound track. If you check back in Figure 7, this starts at Track 3 and continues to track 8. Because you've selected Pick Consecutive Channels, the only active channel is the first; once you choose that, Cambria automatically chooses the next five. If you had selected Pick Channels Individually in Figure 14, all channels would be active.
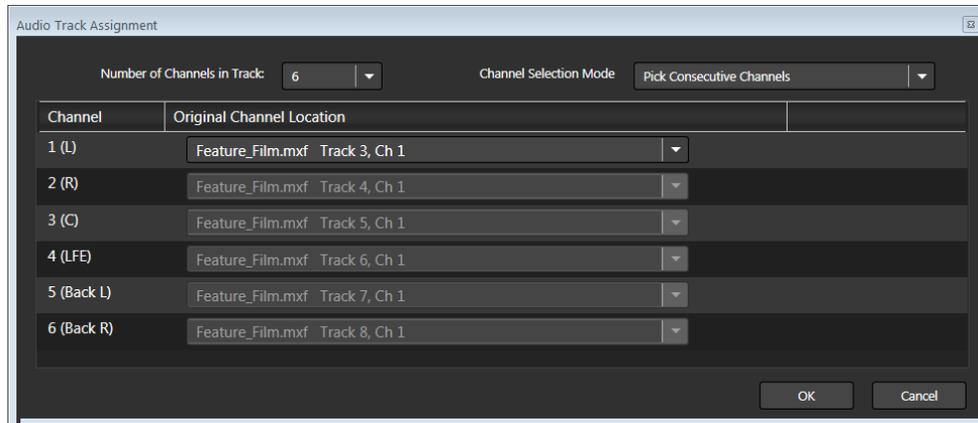
Figure 15. Choosing the channel selection mode.

v. **Save the new track.** Click OK to close the Audio Track Assignment dialog and save the track (bottom right of Figure 15). Cambria adds the track to the Mapped Audio Tracks window.
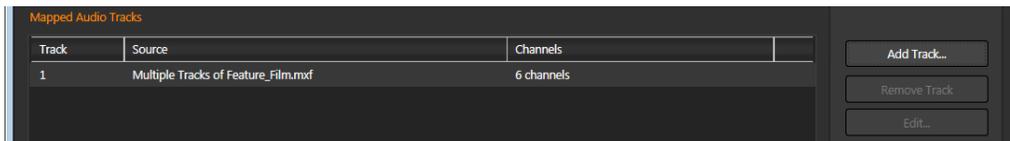
Figure 16. Here's the track you just created.

c.   *Adding another audio source.*

Many times, you'll have to add additional audio files to include them with the video. We'll need to do that to add the English and Spanish stereo mix downs to the project. Here's how.

i. **Open add audio dialog.** On the top right of the Audio Track Mapping dialog, choose Add Audio Source.
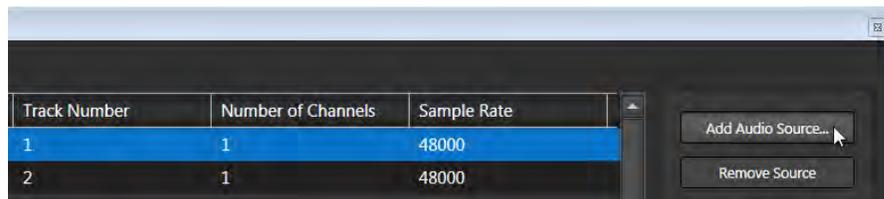
Figure 17. Adding another audio source to the project.

ii. **Select file**. Navigate to and click to select the target file, and click Open. In this case, we selected the English Stereo mix.

iii.   Cambria adds the file to the Original Audio Tracks window atop the Audio Track Mapping dialog, and adds the stereo track as track 2 to the Mapped Audio Tracks window on the bottom of the dialog.
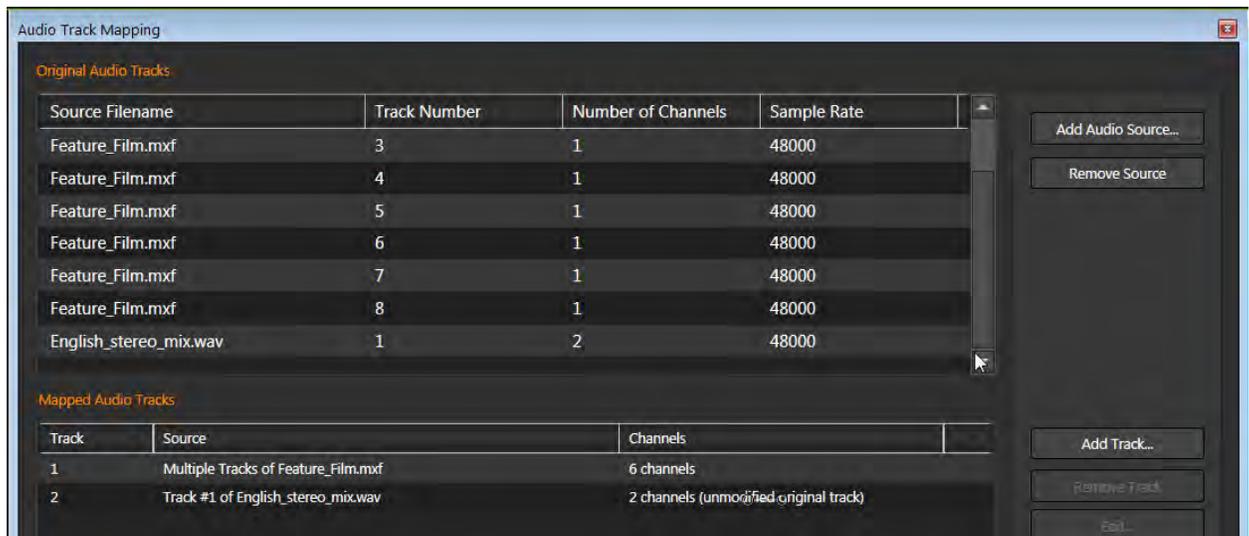
Figure 18. Cambria adds the audio file as an Original Audio Track
and Mapped Audio Track.

During these exercises, we've created two tracks. The first was an English surround track created from channels included in the original file, the second was an English stereo mixdown created outside of Cambria and added as a second track.

III. COMMON MAPPING AND RELATED OPERATIONS

Now that you have the basics, let's focus in on common operations that you'll have to perform and automate during your day-to-day video production. As mentioned above, step 1 is always mapping out the channels in your audio file. For these next exercises, we'll assume that all necessary audio tracks are included with the video file, and that the mapping has changed from that shown in Figure 7 to that shown in Figure 19.

Figure 19. The new audio mappings for the next few exercises.

Our goal here is to create three tracks; one an English stereo track, another an English surround track, and the third a mono mixdown of the Stereo track. Note that the order of the first two tracks is reversed, which we'll correct when creating the English stereo track.

A. Creating a Stereo Track and Choosing the Channels

1. **Add Track.** On the right of the Audio Track Mapping window, choose Add Track.
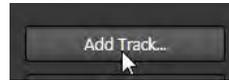
Figure 20. Adding a track.

2. **Configure channels.** Cambria opens the Audio Track Assignment dialog.
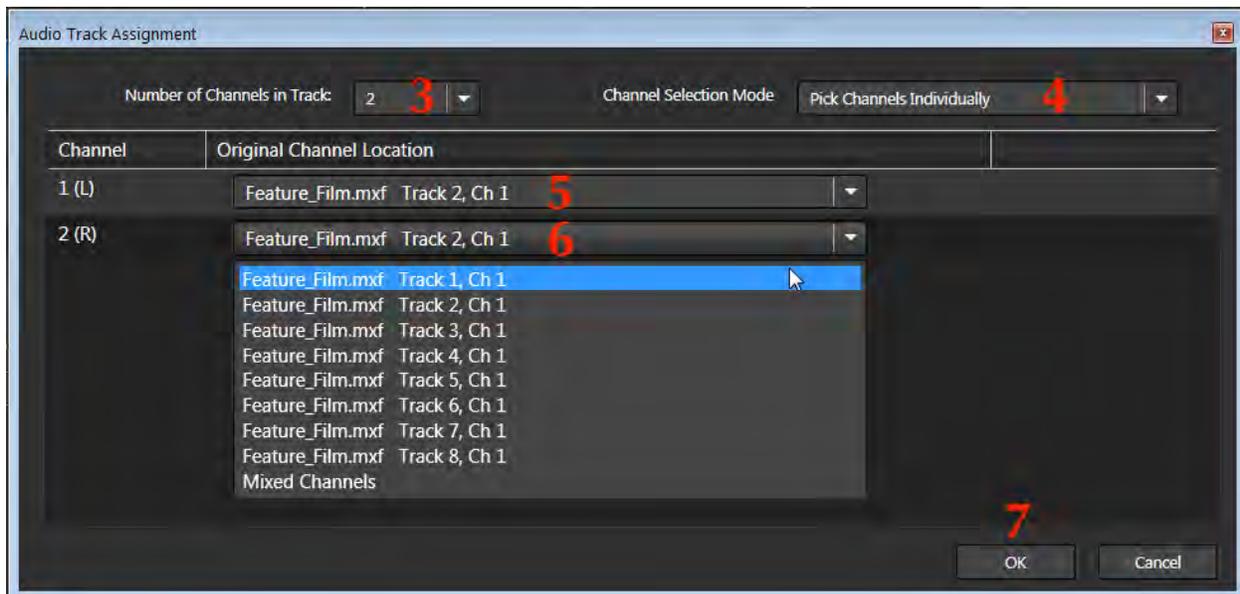
Figure 21. Adding and configuring the stereo track.

3. **Choose number of channels in track.** In the Number of Channels in Track on the upper left, choose 2.

4. **Choose Channel Selection Mode.** In the Channel Selection Mode on the upper right, choose Pick Channels Individually so we can correct the mis-positioning of the left and right stereo tracks.

5. **Fix Channel 1.** In Channel 1, choose Track 2, Ch 1 to move the left stereo channel to its proper location.

6. **Fix Channel 2.** In Channel 2, choose Track 1, Ch 1, to move the right stereo channel to its proper location.

7. **Save the track.** On the bottom of the dialog, click OK to close the dialog and save the new stereo track.

B.   Creating the Surround Track and Choosing the Channels

1.   Add track. On the right of the Audio Track Mapping window, choose Add Track.

2.   Configure Channels. Cambria opens the Audio Track Assignment dialog.
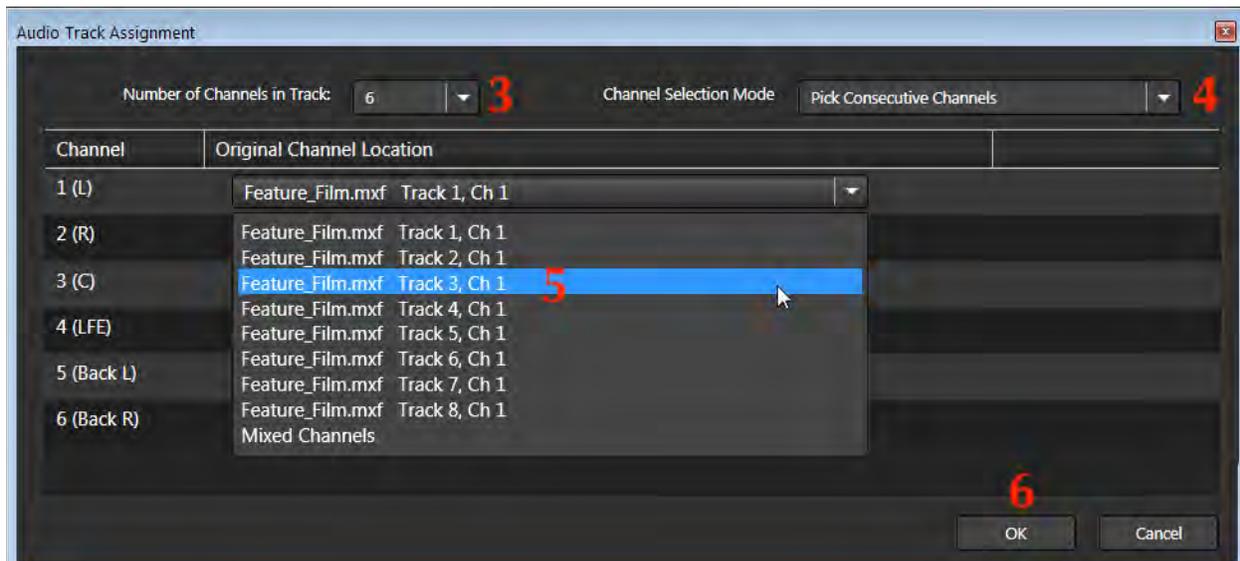
Figure 22. Adding and configuring the stereo track.

3.   Choose Number of Channels. In the Number of Channels in Track on the upper left, choose 6.

4.   Choose Channel Selection Mode. In the Channel Selection Mode on the upper right, choose Pick Consecutive Channels.

5.   Choose first channel. In Channel 1, choose Track 3, Ch 1, which is the first track in the English surround sound sequence.

6.   Save the Track. On the bottom of the dialog, click OK to close the dialog and save the new stereo track.

C.   Creating the Mono Mix

1.   Add track. On the right of the Audio Track Mapping window, choose Add Track.

2.   Configure Channels. Cambria opens the Audio Track Assignment dialog (Figure 23).
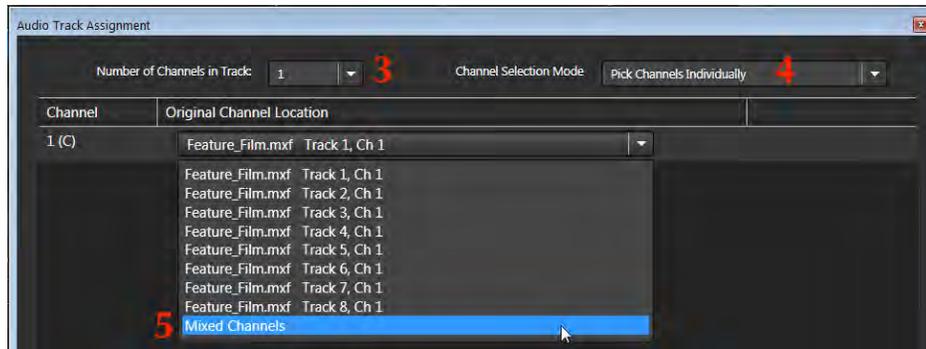
Figure 23. Configuring the mono track.

3.   Choose Number of Channels. In the Number of Channels in Track on the upper left, choose 1.

4.   Choose Channel Selection Mode. In the Channel Selection Mode on the upper right, leave at Choose Channels Individually.

5.   Choose Mixed Channels. In Channel 1, click the drop down list and choose Mixed Channels.

6.   Open Mix interface. Click the ... button to the right of the Mixed Channels drop down (Figure 24).
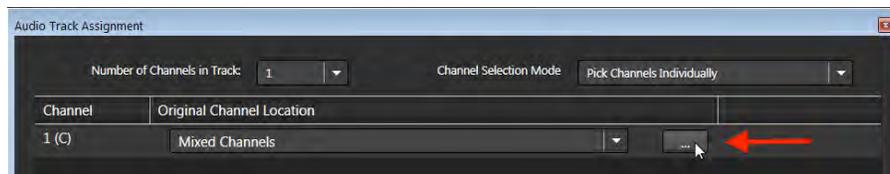
Figure 24. Opening the Mixed Channels Assignment dialog (Figure 25).

7.   **Configure mix.** Cambria opens the the Mixed Channels Assignment dialog. Atop the dialog, set the Number of Channels to Mix to 2.
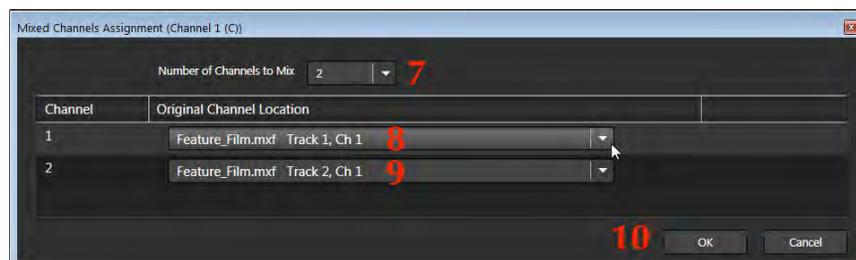
Figure 25. Choosing the channels for the mono mix.

8/9.   Configure tracks. Choose the two stereo tracks to contribute to the mix. Here the track order doesn't matter because the stereo channels will be mixed into a mono file.

10.   **Save track.** Click OK to close the dialog and save the mono track.

D.   Correcting Incorrect Mappings

Another common operation is correcting incorrect mappings. For example, suppose you imported (or created) a stereo mix and later discovered that the left and right channels were reversed. Here's how to correct this.

1.   **Choose Track.** In the Mapped Audio Tracks window, click the track you need to correct.
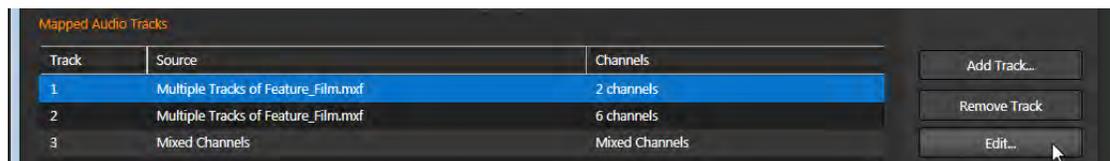
Figure 26. Choosing the track to correct.

2.   **Open edit interface.** On the right of the dialog, choose Edit to open the Audio Track Assignment dialog (Figure 27).
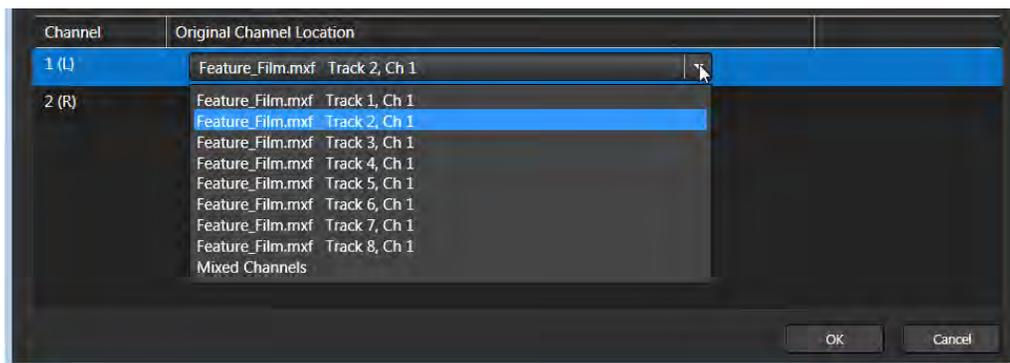
Figure 27. Correcting the mappings.

3.   **Correct and save track.** Make the necessary changes and click OK to close the dialog and save the corrected track.

E.   Separating Multiple Languages Into Separate Files

This builds from what you've already learned but is common enough to warrant a separate exercise. The scenario is shown in Figure 28, a source file with four sets of stereo tracks in four separate languages.

Figure 28. Our starting point.

Tasks will vary from producer to producer, and even project to project. For example, in some instances, you will create four separate video files with Korean, English, Japanese, and Spanish audio. Or, you might be tasked with creating one video file with four tracks, each containing stereo output for the specified language. Or, any point in between.

1.   **Start by deleting all existing tracks.** See the section Deleting all tracks above.

2.   **Then create a stereo track and choose the correct channels.** See Creating a Stereo Track and Choosing the Channels above. If you're creating four separate video files, each with a separate language, you'll have to load the source file four times, create mappings for each language, and output four times. If you're creating a single file with four separate language tracks, keep adding tracks until you've got the four shown in Figure 29.

Figure 29. Creating the four separate stereo tracks for each language.

Note: Critical to any language-related operation is setting the Language Code in the encoding preset. You'll learn how to do that below.

F.   Savings Audio Track Maps

Once you've finalized your audio mapping, it's time to save it for reuse, either within the Cambria interface or via watch folders. Here's how you save the Audio Track Maps.

1.   **Open the Save As dialog.** With the map finalized, click Save on the lower right of the dialog to open the Save As dialog (Figure 30).
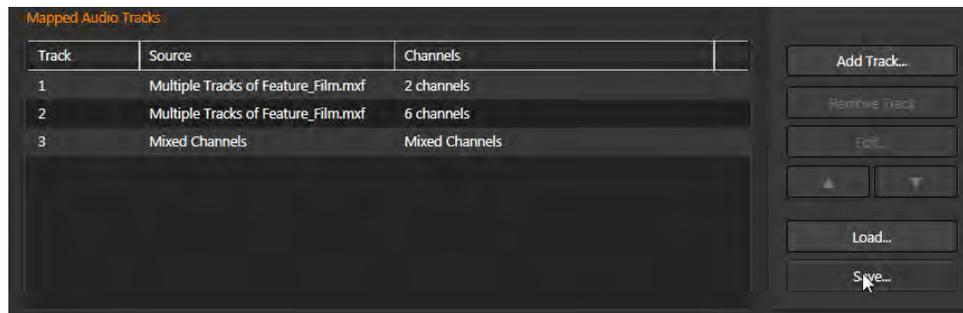
Figure 30. Opening the Save As dialog.

2. **Save the Audio Track Map.** Navigate to the desired storage folder, and name the Audio Track Map as desired (Figure 31). Choose a location that will be easy to find; in the Figure, we've created a folder off the Cambria documents folder. Choose a name that's descriptive to make the preset easy to identify. Then click Save to save the preset.
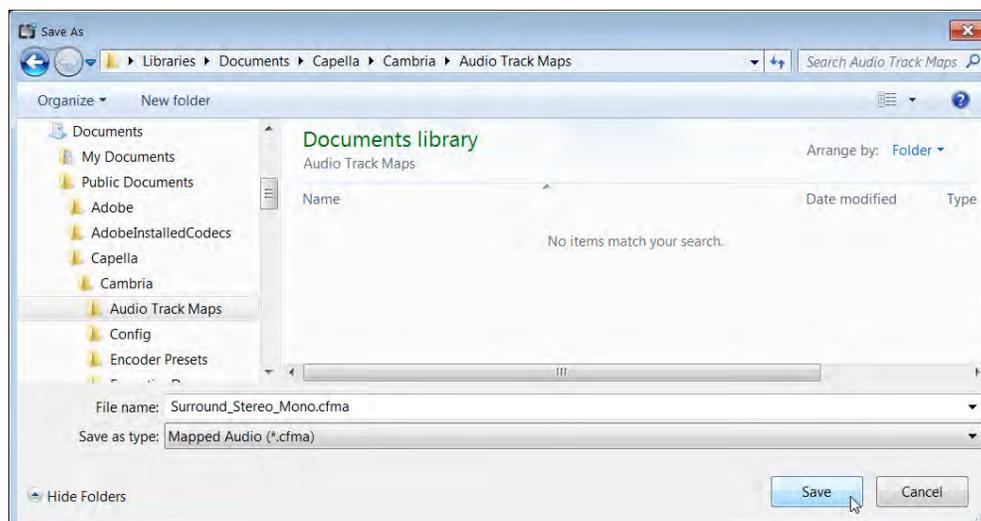
Figure 31. Choosing a location for and storing the Audio Track Map.

G.   Applying Filters to Tracks

Audio filters adjust some aspect of the audio file; normalization, audio compression, or volume adjustments are all common examples. In Cambria, filters are applied to tracks, not channels. So first create your tracks and mappings as shown above, then apply your audio filters.

Here's the guided workflow.

1.   In Cambria's Source panel, choose Filters for the selected file (Figure 32). Cambria opens the Source Filters panel.
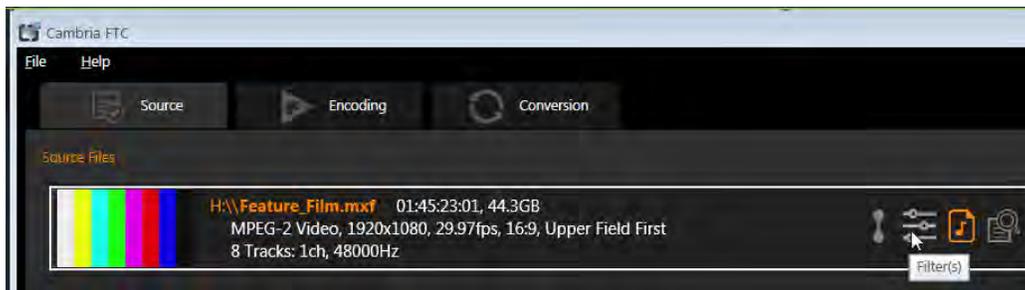
Figure 32. Opening the Filters dialog. Note that the Mapped Audio icon
is highlighted, which tells you that you have applied an Audio Track Map.

2. **Choose the filter.** In the Source Filters dialog, choose the desired filter (Figure 33).
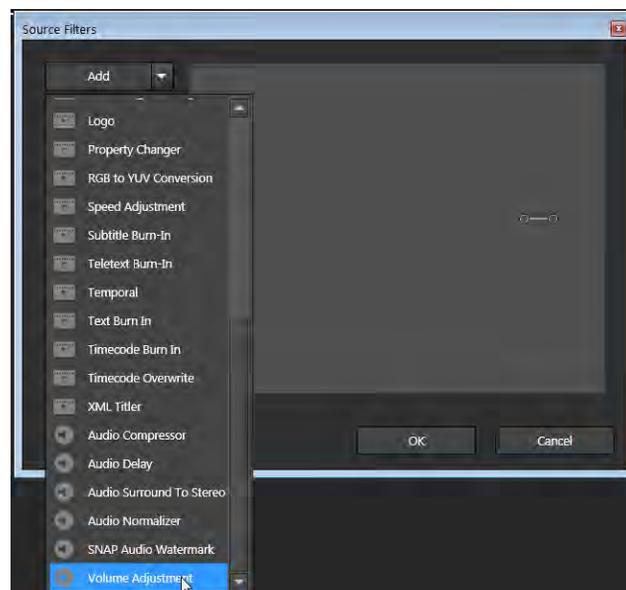

Figure 33 Choosing the Volume Adjustment filter.

3. **Choose the desired track.** Each filter has a unique interface, but all enable you to select the track to be filtered, or all tracks.
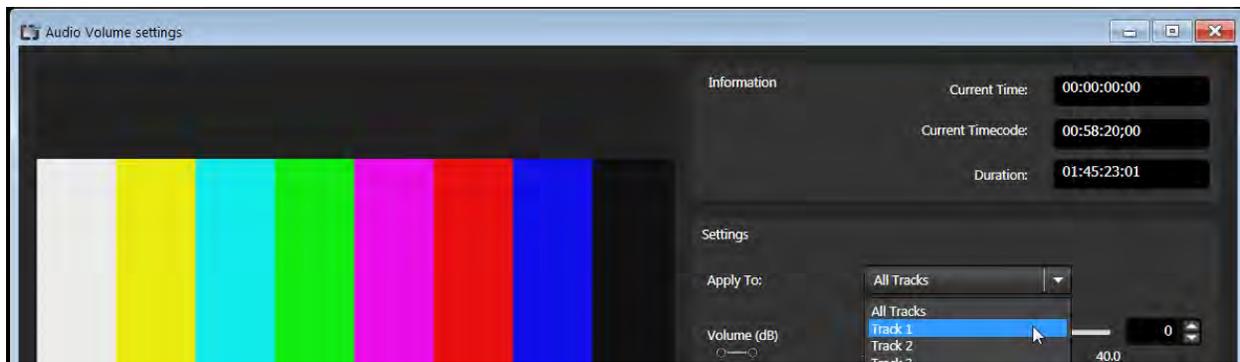
Figure 34. Choosing the tracks to filter.

4.   Configure the filter as normal, and click OK to save the filter and setting.

H.   Finalizing Audio Adjustments in the Encoding Preset

Once you've mapped your audio correctly, you have to setup your encoding preset to encode the various tracks to the desired configurations with the appropriate metadata. Here we'll be working with the stereo, surround, mono mix created and stored in Figure 30. There are three tracks, track 1 is stereo, track 2 is 5.1 surround, and track 3 a mono mix. Here are the steps.

1.   In the Encoding tab, load and open the preset as normal.

2.   Choose the number of audio tracks in the drop down list. It's 3 for this exercise.
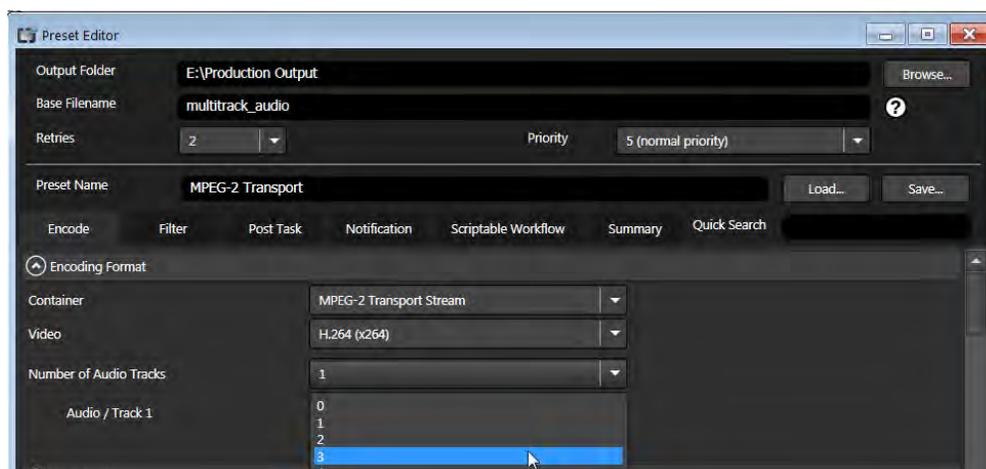
Figure 35. Configuring encoding preset.

3.   Then choose the codec and source for each audio track (Figure 36). Here we'll encode the mono and stereo tracks in AAC audio, and the surround track with Dolby Digital.
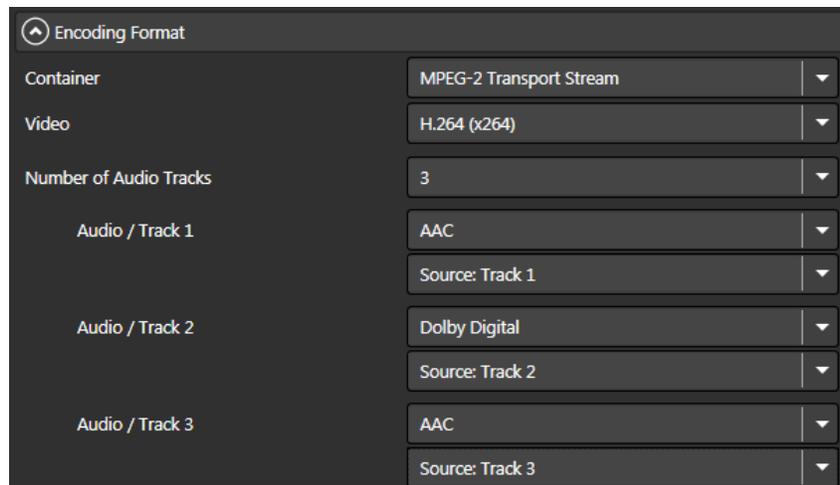
Figure 36. Designating the codec and source for each of the three tracks.

4.   Scroll down and set the number of channels and encoding parameters for each track. Figure 37 shows the output parameters for track 1. Note that the specific encoding parameters will vary by project and output format.
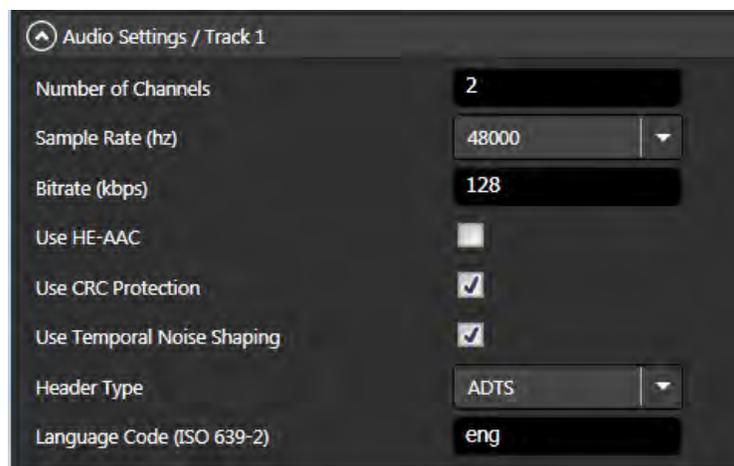
Figure 37. Configuring audio track 1.

5.   Figure 38 shows some of the settings for track 2. Note that Dolby output is extremely technical, and that these configurations may not be appropriate for your project.
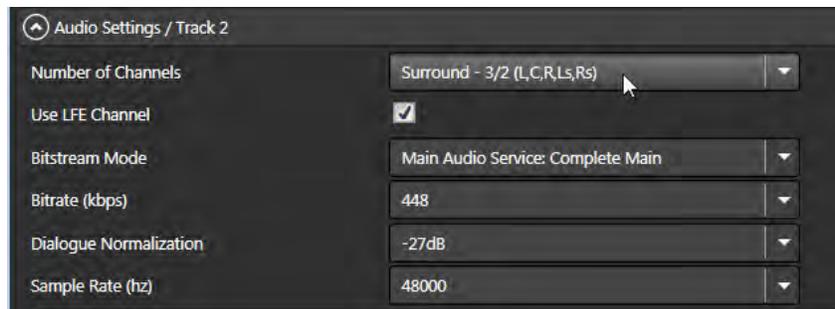
Figure 38. Setting some of the Dolby Surround Sound options.

6.   Figure 39 shows the settings for track 3. Again, these settings are for demonstrative purposes only.
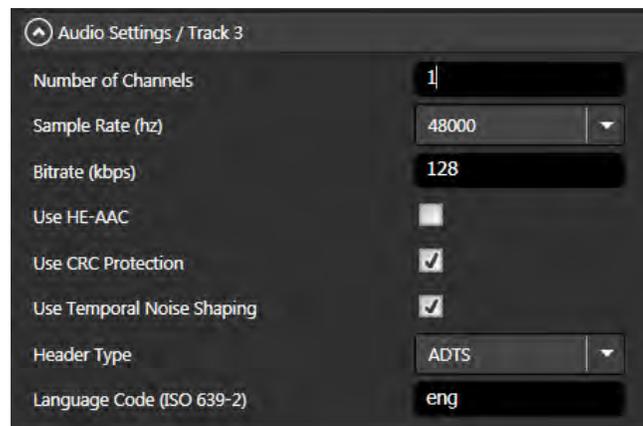
Figure 39. Configuration for the third Audio track.

7.   Configure all other parameters as normal, and then click OK to save the settings to the preset.

Note: Saving the settings as shown above will only save the configuration for that encoding cycle in Cambria, it won't save the settings with the preset. To save the settings with the preset for re-use in Cambria or the watch folder interface, save the preset using the Save button shown on the upper right of Figure 35.

I.   Working with Saved Audio Track Maps

Once you've saved an Audio Track Map, you can re-use it in three different locations.

1.   Loading an Audio Track Map in the Audio Track Mapping Dialog

Loading the Audio Track Map into the Audio Track Mapping dialog lets you reuse the map for a single encode.

a. **Choose the Audio Track Map.** In the Audio Track Mapping Dialog, click Load on the lower right of the Mapped Audio Tracks window (Figure 40).
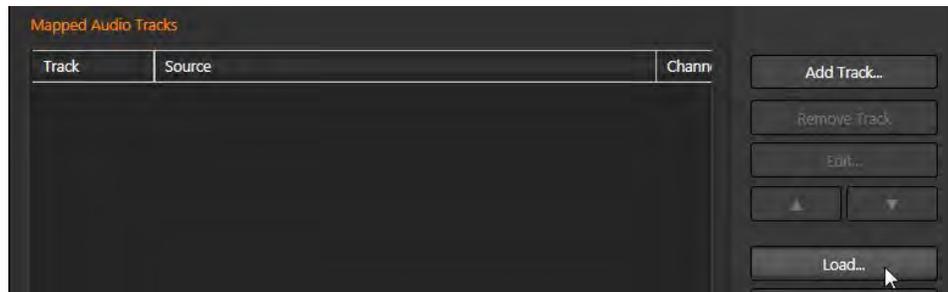
Figure 40. Loading a saved Audio Track Map into the Audio Track Mapping dialog.

b. **Open the Map.** Navigate to and select the saved Audio Track Map, and click Open (Figure 41).
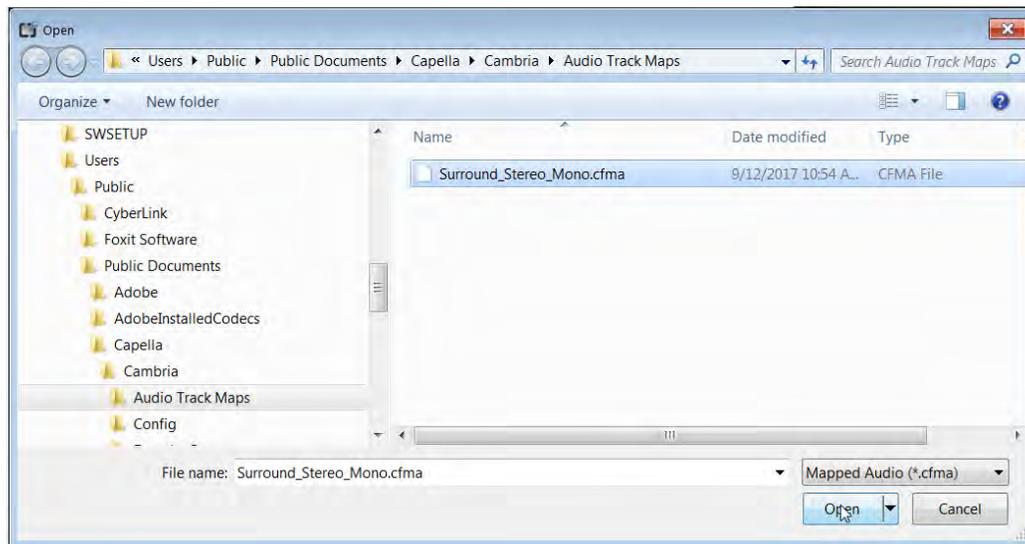
Figure 41. Choosing the Audio Track Map.

c.   Cambria loads the Audio Track Map into the Mapped Audio Tracks window (Figure 42)
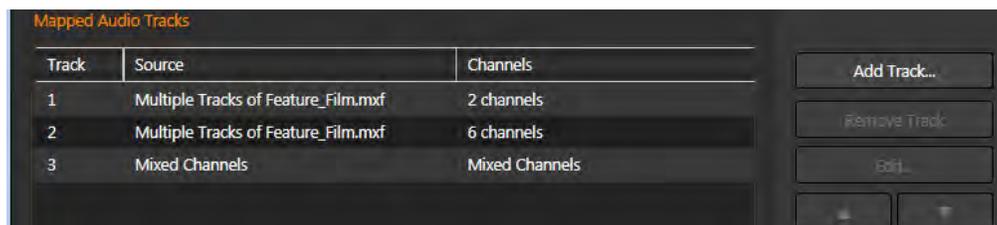
Figure 42. The loaded Audio Track Map ready for use.

2. Loading an Audio Track Map in the Source Tab

Loading the Audio Track Map into the Source tab applies the map to all files in the source that match its configuration. When encoding multiple files with different configurations, you can load multiple Audio Track Maps and Cambria will apply each map to the first file that matches its configuration.

a.   Choose the Audio Track Map. In the Source tab, click Auto Audio Track Map on the lower right (Figure 43).
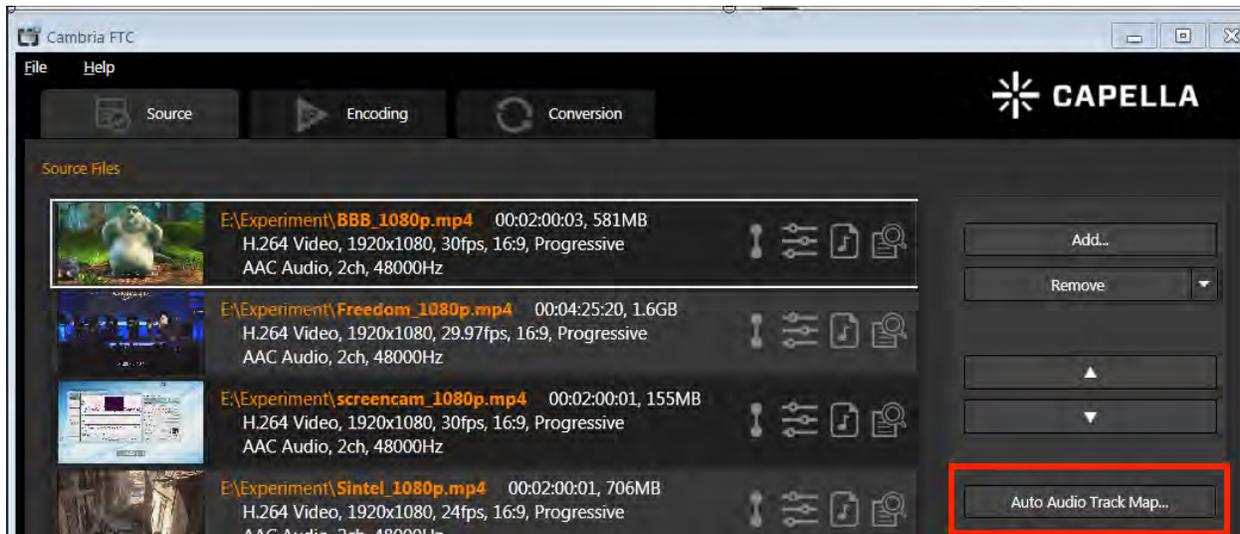
Figure 43. Loading a saved Audio Track Map into the Source tab.

b.   Open the Map. Cambria opens the Auto Audio Track Mapping window (Figure 44). On the upper left, click Add. Then navigate to and select the saved Audio Track Map, and click Open.
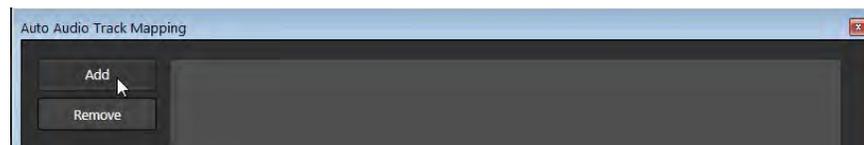
Figure 44. Adding Audio Track Maps to the Auto Audio Track Mapping dialog.

c.   Cambria loads the Audio Track Map into the Auto Audio Tracks Mapping dialog (Figure 45). Again, you can load multiple Audio Track Maps into the dialog and the tracks will be mapped when the source audio configuration matches the Audio Track Map. When finished adding Maps, click OK to close the dialog.
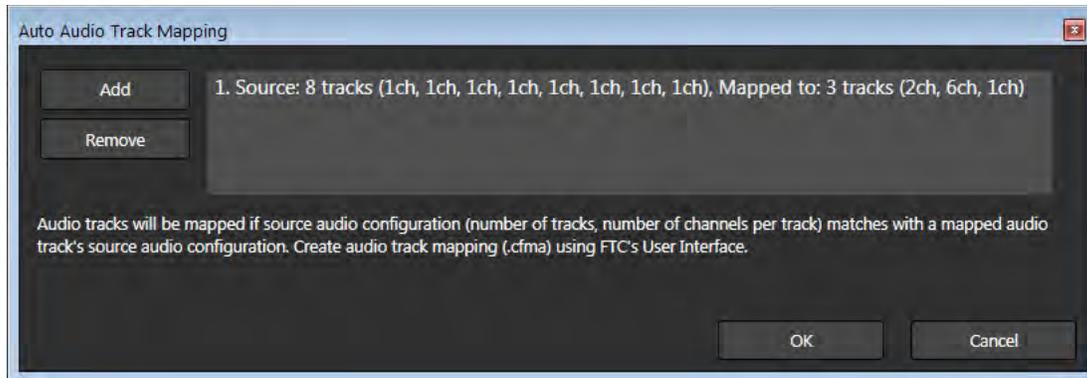
Figure 45. The loaded Audio Track Map ready for use.

3.   Loading an Audio Track Map in the Watch Folder Configuration

Loading the Audio Track Map into Watch Folder Configuration applies the map to all files saved to the watch folder that match its configuration. You can load multiple Audio Track Maps and Cambria will apply each map to the first file that matches its configuration.

a.   Add Simple Action to Watch Folder. In the Watch Folder Configuration screen, choose a folder as normal. Then click the Encoding tab, and choose the Add Simple Action Button on the lower right (Figure 46). Cambria opens the Add Simple Action dialog.
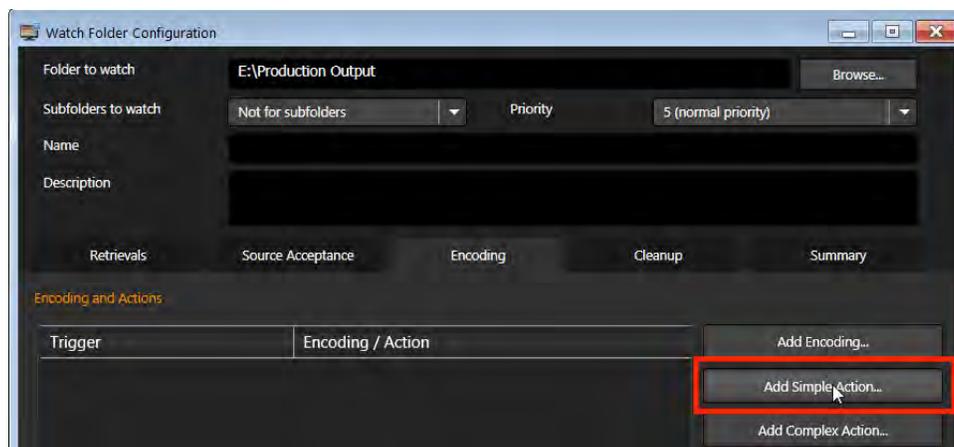
Figure 46. Adding a simple Action.

b.   Choose your encoding setting. In the Add Simple Action dialog (Figure 47), click Edit to open the Preset Editor. Load your preset as normal and click OK to close the Preset Editor and return to the Add Simple Action dialog.
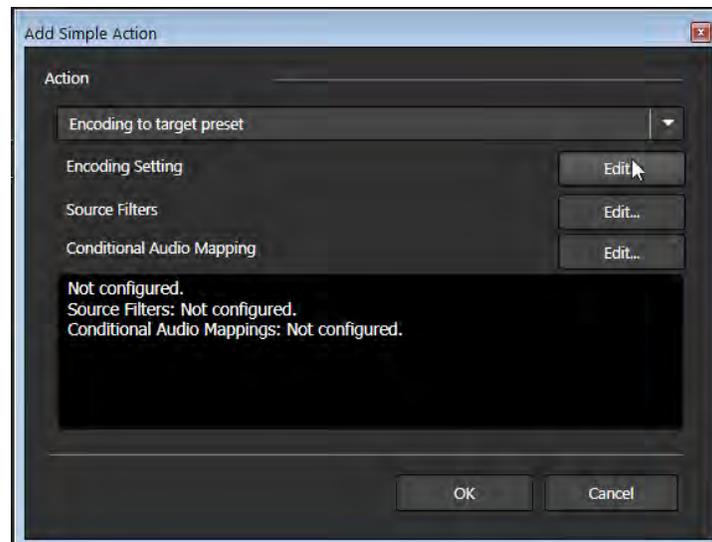
Figure 47. Chose your encoding setting and Audio Track Map from this dialog. .

c.   Load the Audio Track Map. In the Add Simple Action dialog, click the Conditional Audio Mapping button to open the Conditional Audio Mapping dialog (Figure 48). On the upper left, click Add. Then navigate to and select the saved Audio Track Map, and click Open.

Figure 48. Adding Audio Track Maps to the Conditional Audio Mapping dialog.

d.   If needed, add additional Maps. Cambria loads the Audio Track Map into the Auto Audio Tracks Mapping dialog (Figure 49). Again, you can load multiple Audio Track Maps into the dialog and the tracks will be mapped when the source audio configuration matches the Audio Track Map. When finished adding Maps, click OK to close the dialog.
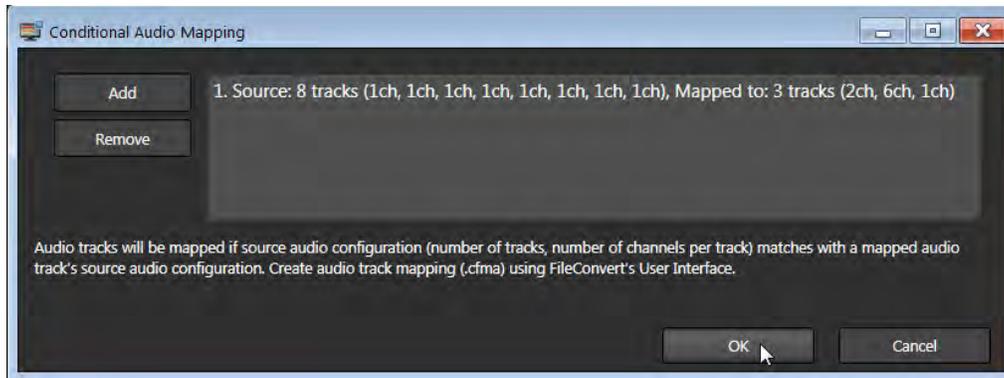
Figure 49. The loaded Audio Track Map ready for use.

e.   Close dialogs and review. Click OK to close the Conditional Audio Mapping dialog, and OK again to close the Add Simple Action dialog.
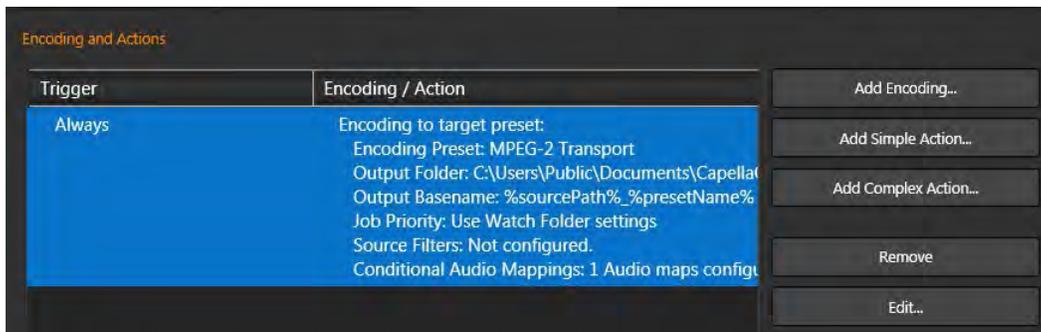
Figure 50. The Watch Folder with the Conditional Audio Mapping.