

# AUTO ALIGN POST 2

Engineering  
Emmy Award  
Winner



## SOFTWARE MANUAL

**Sound Radix**  
break free.

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# SYSTEM REQUIREMENTS

## MAC:

- 64-bit Intel Core CPU or Apple Silicon Chip
- 8 GB RAM or higher
- macOS 10.14 or higher
- iLok License Manager 5.4 or newer

## WINDOWS:

- 64-bit Intel Core or AMD CPU
- 8 GB RAM or higher
- Windows 10 or higher
- iLok License Manager 5.4 or newer

## PLUG-IN FORMATS:

- AudioSuite\*
- ARA2 on supported hosts
- Adobe Premiere Pro Extension
- Blackmagic DaVinci Resolve Workflow Integration\*\*

## MINIMUM SUPPORTED HOSTS:

- Pro Tools 11 (AudioSuite) / Pro Tools 2024.6 (ARA2 and AudioSuite)
- Cubase/Nuendo 11
- REAPER 6.0
- Studio One 4.6
- Premiere Pro 2020-14.0
- DaVinci Resolve **Studio** 19.1.0

\* Media Composer is not supported.

\*\* Workflow Integrations are only supported by DaVinci Resolve **Studio** versions.

## AUTHORIZATION:

To use Auto-Align Post 2, you'll need a free iLok account and the iLok License Manager application. To create an iLok account and download the iLok License Manager, please visit <https://www.ilok.com/>. An iLok USB device is not required to use Auto-Align Post 2.

1. Log-in to Your Account at <https://www.soundradix.com/account/login/>
2. Enter your license redeem code in the “New License Activation” box, then click “Redeem”.
3. Enter your iLok account user ID and email address, then click “Redeem” again.
4. Auto-Align Post 2 will now appear in your product downloads, and the license will become available in your iLok account.

Once your Auto-Align Post 2 license has been added to your iLok account, it can be used to authorize the plug-in in one of two ways:

### iLok USB Device:

Can be purchased online or at retailers where professional audio equipment is sold.

#### Pros:

- If you work on multiple machines, it allows you to easily migrate from one machine to another.
- For freelancers who travel to different studios, you can have an assistant engineer install the plug-in before you arrive, but you don't have to provide them with your login credentials to authorize the software. You just bring the key with you.
- When upgrading machines, there is no need to deactivate licenses.

#### Cons:

- Requires the iLok to be connected in order to use the software, using up an available USB port.
- An iLok USB device can be lost or stolen.

### Host Drive Authorization:

#### Pros:

- Free (doesn't require the purchase of an iLok USB device).
- Opens up a USB slot, or in the case of many modern laptops which don't have USB slots, avoids having to connect USB adapters or hubs.
- A perfect solution for those using a single computer.

**Cons**

- A license must be deactivated on one machine before it can be activated on another. This requires returning the license to your account through the iLok License Manager.
- When traveling to different studios, an additional step is required upon your arrival.
- Authorizations can be compromised in the event of a hard drive or machine failure.

**It is important to note that regardless of which method is used, a single license can only be used on one machine at a time. If you wish to use Auto-Align Post 2 on multiple workstations simultaneously, additional licenses must be purchased.**

If an Auto-Align Post 2 license is activated on a host drive, it can later be transferred to an iLok USB device associated with the same iLok account at no charge.

**INSTALLATION:**

Download and install the **Auto-Align Post 2** installer. Run the application and follow its on-screen instructions. Please note that you may need administrator permissions and password to install **Auto-Align Post 2**. When the installation is complete, quit the installer.

Prior to the first DAW launch after installation, your **Auto-Align Post 2** license can be activated to your host drive or iLok USB device through the iLok License Manager. If this has not been done, you will be prompted to activate the plug-in during your DAW's startup sequence. You will need to enter your iLok account credentials, so please have them handy when using this authorization method.

## PLUG-IN OVERVIEW

**Auto-Align Post 2 automatically and dynamically aligns the phase of dialogue recordings captured with multiple microphones.**

In modern film and video shoots, it is common to record dialogue with a combination of shotgun mics mounted on boom poles, wireless lavalier mics attached to the talents' wardrobes, and planted microphones hidden in objects on the set. Throughout a take, the boom mic will frequently move to grab lines from different characters. Actors, at times, will move about the set or turn their heads to address other characters. As all of this movement is happening, the relative distance between each sound source and each microphone constantly changes.

As a result, comb-filtering or phase-related cancellations at harmonic intervals throughout the frequency spectrum are introduced when combining these sources.

The problem becomes more complex in production sound (sync sound) recordings because of the continuous variations resulting from on-set movement. Aligning the phase of two sources at one point in time in these recordings does not guarantee that they will remain in phase over time.

Enter **Auto-Align Post 2**. Built on the trusted [Auto-Align®](#) algorithm, but with its operation tailored to serve the audio post-production industry, Auto-Align Post 2 is a next-generation phase and timing alignment algorithm. This revolutionary process turns the phase/time correction of moving multi-microphone recordings over an entire film into a few clicks and a short coffee break.

## FEATURES

- Corrects for delays of  $\pm 100\text{ms}$  or distances of up to  $\sim 112\text{ feet} / \sim 34\text{ meters}$
- Multi-band phase rotation to correct phase shifts between microphones
- Dynamic mode enables continuous phase/time correction for moving actors, mics, or cameras
- Static mode enables fixed phase/time correction for stationary microphones
- Multi-channel support
- Optimized for multi-threading across CPUs to improve processing times
- Easy to operate - no manual adjustments required

# TIME ALIGNMENT MODULE

## DYNAMIC MODE

Because it is difficult to predict and adapt to the ever-changing time-arrival discrepancies of lavalier and boom mics on set, in the past, we have typically been forced to choose one mic or another for each dialogue line. However, there are plenty of situations where playing two mics simultaneously can be beneficial. One scenario would be a project with a limited foley budget, to be released in a single language. On those types of projects, we tend to favor the boom because it has more realistic clothing, footstep and prop sounds. If one character turns away from the boom for a handful of lines, though, it's nice to slip in a little of their lavalier mic to enhance the boom recording.

Lining up the audio from the two sources so that they combine additively can require a lot of trial and error, involving nudging, polarity flips, and phase rotation. The end result is often a compromise to achieve the best average solution. Using [Dynamic Mode](#) in Auto-Align Post 2 (AAP2) removes the time-consuming guesswork and produces results with a degree of accuracy that would not be humanly possible. Not only will it alter the phase and timing from clip to clip, but it will also adaptively align the phase within each clip. If the character is walking towards the boom throughout the line, for example, the AAP2's [Dynamic Mode](#) will track the evolving timing change, and persistently update its corrections. It can track and correct timing problems due to time arrival delays of up to 100 ms, which is equivalent to about 112 feet or 34 meters.

## STATIC MODE

AAP2's [Static Mode](#) was designed to allow for fixed alignment for stationary microphones setups or simply in cases where fixed time alignment is preferred.

Another time-consuming problem that dialogue editors often face can be introduced at different points in a workflow but stem from a singular problem. Whether the recordist's cart features multi-track recording software printing isolated tracks, and a separate field recorder for printing reference mixes from their mixer; or the recordist is using a multi-track mixer/recorder, and a reference mix is being sent to the camera, there are numerous scenarios which see multiple recorders being synchronized with timecode on set. The files captured by these devices would often be introduced at different points in the workflow.

Remember that we capture audio in thousands of samples per second, while timecode is merely tens of frames per second. There is a known issue in many recorders that causes them to round the audio recording's timecode to the nearest frame, rather than starting the recording exactly at the start of a timecode frame. When employing the handy Pro Tools "Field Recorder Workflow", despite the edges of clips aligning perfectly with picture edits, the underlying audio in the multi-track clips may be out of sync from the reference mix from the camera or separate field recorder. A similar problem sometimes occurs when exporting OMF or AAF files from NLE's where the OMF/AAF file's clips align with picture edits, but their underlying audio slips out of sync from the editor's reference mix.

Because the sync offset often varies from clip to clip, aligning the audio manually can be quite tedious. AAP2's [Static Mode](#) is designed to automatically analyze and "nudge" the audio within each clip as well as its handles so that it can be accurately synchronized to the reference mix.

## PHASE CORRECTION MODULE

If a single sound source hits two microphones out of time from one another, all of the frequencies are shifted out of phase by the same amount of time. This is where the [Time Alignment Module](#) can be very effective. By shifting the signals into time with one another, comb filtering is minimized or eliminated as everything locks into phase. Unfortunately, temporal delays are not the only potential cause of phase discrepancies in multi-mic recordings. Another culprit would be filters, especially when they are engaged in certain mixer channels but not others, or when built-in filters are engaged on shotgun mics, but the mixer's filters were used on lavs.

When all of the channels are processed by the same filter circuit or none at all, the [Time Alignment Module](#) is enough to solve most alignment issues. However, when different signals are processed by different filters, cancellations, particularly in the low frequencies, are still likely to occur. For this reason, in addition to significant sonic improvements to the time-alignment algorithm, AAP2 features an all-new [Spectral Phase Module](#). This is offered as a selectable alternative to the [Polarity Mode](#), which was built into the time-alignment process in the original AAP2.

### SPECTRAL PHASE MODE

[Spectral Phase Mode](#) is best suited to situations where different phase shifts may have affected the reference track and the track or tracks that are being processed. In these cases, all-pass filters are applied to the specific frequency bands that are out of phase from the [Reference Track](#), rotating them into proper alignment. In general, all-pass filters don't increase gain or noticeably color the individual tracks, but in some cases in which they are employed, they can affect the way that the signal will interact with dynamics processors. Instead, AAP2 targets specific frequencies that are out of phase from the [Reference Track](#) and only engages phase shifts when needed to align these frequencies. Because of this, the processing is remarkably transparent, causing minimal side effects while still being extremely effective.

### POLARITY MODE

[Polarity Mode](#) does not employ all-pass filters. It merely detects whether signals are 180° out of polarity (or close to it) relative to the [Reference Track](#) and reverses the polarity of those signals. As a result, [Polarity Mode](#) is much less effective at correcting for phase shifts imparted by filters, but when phase shifts don't exist, [Polarity Mode](#) is even more passive than [Spectral Phase Mode](#) in its processing. In many cases, [Polarity Mode](#) will not affect the audio at all. When merely addressing timecode slips or timing inaccuracies between NLE reference mixes and AAF clips, for example, [Polarity Mode](#) is recommended.

Either [Phase Mode](#) can be used with or without time correction. When time and phase correction are used together, the behavior of the [Phase Mode](#) will follow the selected [Time Mode](#). In other words, phase

adjustments or polarity flips will adapt over time when using [Dynamic Mode](#), but will adhere to a singular phase rotation value across each band or single polarity value when using [Static Mode](#).

## AUDIOSUITE GUI MAP

This AudioSuite GUI map is broken into three separate diagrams focusing on the [Main Controls](#), the plug-in's [Viewers](#), and specific [AudioSuite functions](#) which are relevant to the operation of AAP2. For more comprehensive information on AudioSuite plug-ins, please consult your Pro Tools reference manual.



Figure 1A: Main Controls

### FIGURE 1A:

- 1. Reference Track:** Chooses the primary audio source to which the phase and timing of the other microphones will be aligned.

## 2. Time Mode Selection:

- **Dynamic Mode:** Makes continually varied phase and timing adjustments throughout the selected clip(s).
- **Static Mode:** Applies a timing shift of a singular value throughout the audio of each selected clip (if [Clip by Clip](#) is active) or across the entire selection (if [Entire Selection](#) is active).
- **Off:** Disables corrective time-stretching, allowing [Phase Mode](#) to be used exclusively.

## 3. Phase Mode Selection:

- **Spectral:** Applies multi-band phase rotation to best match the phase in all frequencies.
- **Polarity:** Disables all-pass filters and instead uses polarity flips, when appropriate, to correct any polarity discrepancies encountered.

## 4. Visualize:

Loads visual feedback into the plug-in's different [Viewers](#) without actually applying processing.

*Note: Applying the [Render](#) button prior to pressing [Visualize](#) will load the same before/after visual feedback into the [Viewers](#) as [Visualize](#). For this reason, it is not necessary to press [Visualize](#) before rendering. When processing multiple clips in [Clip by Clip](#) mode, only the first clip of the selection is displayed. For performance considerations, [Visualize](#) length is capped at 40,000,000 samples per channel.*



Figure 1B: View Options

## FIGURE 1B:

- A. **Navigation Bar:** Displays an overview of the entire selection of audio to be processed and allows certain areas to be investigated further.
- B. **Main Viewer:** Displays the phase relationship of the selected audio to the [Reference Track](#). A variety of options allow different aspects of their correlation to be revealed in great detail, both before and after processing.
- 1. **Focus Area Bubble:** Selects which portion of the selected audio will be shown in the [Main Viewer](#). When clicking in the middle of the Focus Area Bubble, a grabber allows the bubble to be dragged along the track, retargeting the focus of the [Main Viewer](#). Rolling your mouse or trackball's scroll-wheel inside of the [Main Viewer](#) will have the same effect.

When clicking and dragging on the ends of the bubble, its width can be stretched or narrowed, thus zooming in or out in the [Main Viewer](#). Zooming in and out can also be done by holding Shift, either while dragging the Focus Area Bubble or while scrolling the [Main Viewer](#).

2. **Zoom Controls:** Increase or decrease the zoom level of the [Main Viewer](#). Changing this value also affects the width of the [Focus Area Bubble](#).
3. **View Mode:** The [Main Viewer](#) displays the relationship of the selected audio to the [Reference Track](#). View Mode toggles between displaying this relationship before processing or afterward.
  - **Source:** Displays the phase and timing relationship of the unprocessed selection, relative to the [Reference Track](#).
  - **Aligned:** Displays the phase and timing relationship of the selected audio to the [Reference Track](#) after it has been subjected to the processor-imparted phase and timing shifts.
4. **Waveform Correlation View:** This shows the waveforms of the selected audio and [Reference Track](#) overlaid on top of one another. (Figure 1B displays Waveform Correlation View)
  - **Teal:** Represents the waveform of the selected audio being processed.
  - **Pink:** Represents the waveform of the [Reference Track](#).
  - **White:** Represents areas where both waveforms overlap.
5. **Spectral Phase Correlation View:** This shows the phase correlations between the selected audio and the [Reference Track](#) using frequency-specific bar graphs. (For more information, [see Figure 1C on page 10](#))
6. **Phase Correlation Meter:** This shows the positive, negative, or neutral phase relationship between the selected audio and the [Reference Track](#). This meter applies to the area selected by the [Focus Area Bubble](#).
  - A positive value indicates that the signals would add if combined.
  - A negative value indicates that cancellation would occur if the signals were combined.
  - A null (centered) value indicates that the two signals would not have significant interaction if combined.
7. **Time Display:** This shows the current position of the [Focus Area Bubble](#) in "Minutes: Seconds . Milliseconds" relative to the start of the selected audio.

*Note: This time value does not correlate directly to the Pro Tools Main Counter, but instead correlates to the relative time within the selection.*
8. **Show/Hide Main Viewer:** Collapses the plug-in GUI to show only the [Navigation Bar](#), or expands it to reveal the [Main Viewer](#).

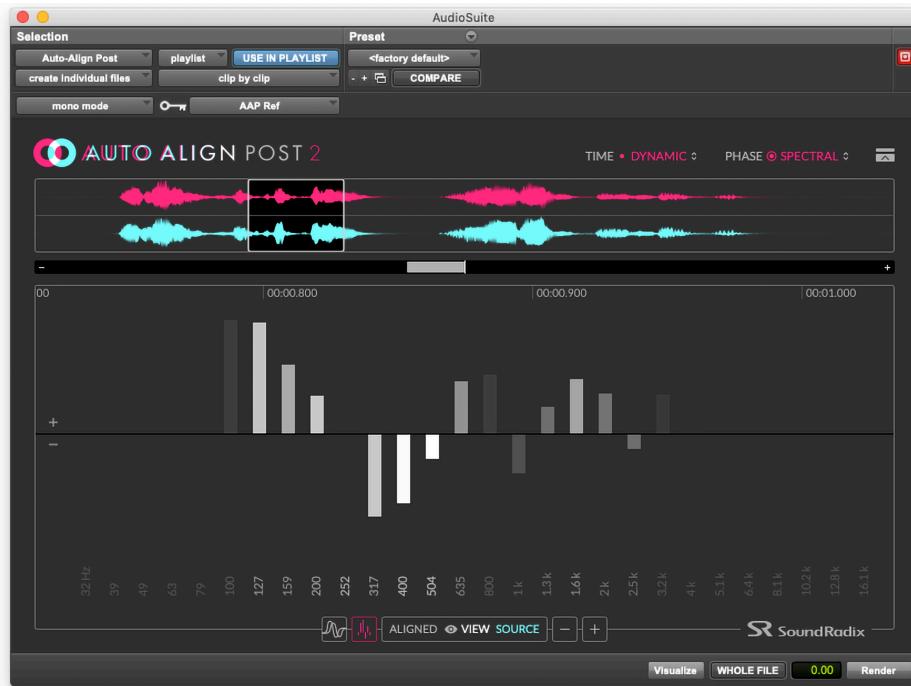


Figure 1C: Spectral Phase Correlation View

## FIGURE 1C:

When **Spectral Phase Correlation View** is selected, the **Main Viewer** displays the phase correlation between the **Reference Track** and the processed audio using frequency band-specific bar graphs. The **Focus Area Bubble** determines the portion of the two signals that will be analyzed and displayed.

**Upward Projecting Bar:** Indicates a positive phase correlation between the two signals at that frequency band. Signals would add at that frequency band if summed together.

**Downward Projecting Bar:** Indicates a negative phase correlation between the two signals at that frequency band. Signals would cancel at that frequency band if summed together.

**Bar Height:** The height of the bar indicates the strength of the correlation between the two signals.

- Taller bars indicate a stronger correlation.
- Shorter bars indicate a less intense correlation.

**Bar Opacity:** The opacity/transparency of a bar indicates the amount of content present in that band.

- More Opaque / Brighter colors: indicates that there is more content in that band.
- More Transparent / Faded colors: Indicates that there is less content in that band.



Figure 1D: AudioSuite Settings

## FIGURE 1D:

- 1. Entire Selection / Clip by Clip:** The primary function of this control is to determine what will happen if multiple clips are selected and processed at once. There are a number of byproducts of each mode that are of great significance:
  - **Entire Selection:** All selected clips will be consolidated and processed as one, resulting in a single audio file being written and a single clip appearing on the track. Any Clip Effects, Clip Gain and/or fades pertaining to the selected clips will be permanently rendered to create the new audio file.
  - **Clip by Clip:** Each selected clip will be processed individually, potentially resulting in a number of new audio files being created, with the original clip definitions being maintained. Any Clip Effects, Clip Gain, and/or fades will remain editable on the selected clips, and will not be permanently rendered.
- 2. Create Continuous Files/Create Individual Files:** When using some AudioSuite plug-ins, Create Individual Files with [Entire Selection](#) processing renders the result of the plug-in with all of the byproducts of [Entire Selection](#) processing (permanently applying real-time effects), but still processes the clips separately. With Auto-Align Post 2, that mode is unavailable, as these two choices are directly connected to the [Entire Selection / Clip by Clip settings](#):
  - **Create Continuous Files:** Automatically switches to [Entire Selection](#) processing.

- **Create Individual Files:** Automatically switches to [Clip by Clip](#) processing.

**3. Mono Mode/Multi-Input Mode:** Determines how multi-channel clips will be processed:

- **Mono Mode:** Each channel of a clip will be individually analyzed and adjusted to align with the [Reference Track](#).
- **Multi-Input Mode:** All of the channels within a clip are cumulatively analyzed and all channels are adjusted equally to align with the [Reference Track](#).

We recommend using Multi-Input Mode for stereo and surround clips because Mono Mode can throw the channels within a clip out of sync with each other. Multi-Input Mode supports clips up to 48 channels, while Mono Mode can process an unlimited number of channels.

*Note: Choosing Multi-Input Mode will automatically set the plug-in to [Entire Selection](#) / [Create Continuous Files](#) processing mode.*

**4. Handle Length:** When using [Clip by Clip](#) / [Create Individual Files](#) processing, the plug-in can process underlying audio beyond the selected clips' boundaries. The amount of additional audio processed can be truncated to "handles" of a desired length, set here in a value of seconds.

*Note: Pro Tools does not send audio from a clip's handles to AudioSuite plug-ins' sidechain input. Because of this, Auto-Align Post 2 cannot analyze audio within the handles of the [Reference Track](#)'s clips. Instead, audio in the [Reference Track](#) which overlaps with the handles of the clip to be processed will be used as a reference for alignment, which could cause invalid alignments. When processing audio in a clip's handles where there is no relevant [Reference Track](#) data to compare it to, Pro Tools will feed silence into the sidechain input, so this portion of the audio will be processed with the same delay and phase correction values as the last sample at each edge of the selected clip.*

**5. Whole File:** Rather than truncating the underlying audio to handles, the whole parent audio file is processed, while the original clip definitions and real-time effects remain intact on the selected track.

**6. Render:** Applies the AudioSuite processor with its current settings.

## ORDER OF OPERATIONS (AUDIOSUITE)

Now that we've learned the controls, let's take a look at how to use Auto-Align Post 2:

1. **Launch Auto-Align Post 2:** Click on the AudioSuite drop-down menu at the top of the editor window and scroll to the "Other" category or the "Sound Radix" bank from the manufacturers list. Choose the Auto-Align Post 2 plug-in.

*Note: Auto-Align Post 2 currently only operates as an AudioSuite plug-in and cannot be used as a real-time insert.*

2. **Choose Reference Track:** Click on the [Reference Track](#) drop-down menu and select the track in your session to which you would like Auto-Align Post 2 to align the other tracks' audio.
3. **Select Audio to be Processed:** Select a single clip or multiple clips from one or more tracks that you would like to align to the [Reference Track](#). Make sure that you are not selecting clips from the [Reference Track](#), as aligning them to themselves would serve no purpose.

4. **Choose Time and Phase Mode:**

- [Dynamic Mode / Spectral Phase Mode](#) - If you are aligning microphones that had moved throughout takes, such as multiple boom mics, or a combination of boom mics and wireless lavaliers, use this mode for continually-adapted results. In such setups, it is also highly likely that phase shifts had affected the tracks in different ways, so [Spectral Phase Mode](#) is recommended. If you have any doubts, check the [Spectral Phase Correlation Meter](#), particularly in the lower frequencies, and compare the results of [Spectral Phase Mode](#) versus [Polarity Mode](#). From there, choose the mode with the best positive correlation in these areas.
- [Static Mode / Spectral Phase Mode](#) - If you are aligning microphones that had remained in fixed positions throughout takes, such as a lavalier on a seated actor and a stand-mounted boom, [Static Mode](#) will simplify the results by producing a consistent time and phase shift throughout the entirety of each selected clip. Once again, referring to the [Spectral Phase Correlation](#) meter can solidify your choice between [Spectral Phase Mode](#) and [Polarity Mode](#).
- [Static Mode / Polarity Mode](#) - When compensating for timecode slippage when aligning isolated microphones' (ISO's) recordings to a reference mix, it is recommended that [Static Mode](#) be employed with [Polarity Mode](#), as the timecode offset will generally remain consistent throughout each clip and no phase shifts are likely to have occurred.

5. **Choose AudioSuite Settings:** Because a number of AudioSuite functions are tied together when using Auto-Align Post 2, there are really only a handful of options to consider:

- If you are synchronizing multiple-mono ISO's to a reference mix or one or more mono lavalier mics to a boom, it is highly recommended that you use [Mono Mode](#) so that you can process [Clip by Clip](#), [Create](#)

[Individual Files](#), thus preserving your clips' handles, Clip Gain and fades. Basically, if the clips to be aligned are mono, use those settings to preserve all real-time clip effects.

- If the clips to be aligned contain information that is wider than mono, then [Multi-Input Mode](#) is the only way to ensure phase lock between the channels within the clip. Because this will force you into [Entire Selection](#), [Create Continuous Files](#) processing, wherever possible, we recommend extending each clip to create "handles" before processing and then trimming them back down to their original length.

6. **Visualize or Render:** It is not necessary to press [Visualize](#) at any time because [Render](#) will load the same visual feedback into the [Viewers](#). However, if you are still deliberating between time or phase modes and processing large quantities of audio, [Visualize](#) can be faster than rendering and undoing.
7. **Analyze the Effects:** Once the [Viewers](#) are loaded with data, zoom the [Focus Area Bubble](#) to a few key sections of the clip and assess what the plug-in is doing to the audio. When switching between time and phase modes and reloading the [Viewers](#) by pressing [Visualize](#), the [Focus Area Bubble](#) will maintain the same selection, allowing you to easily compare the results. Don't forget to toggle between [Spectral Phase Correlation View](#) and [Waveform View](#) to get the whole picture.
8. **Render if Necessary:** If you have merely been using [Visualize](#) up until this point, don't forget to hit [Render](#) to apply the results.
9. **AudioSuite Tip:** Because AudioSuite permanently renders its results, it is not easy to undo those results at a later date. For this reason, it is always recommended to keep copies of "dry" versions of clips on "X" tracks or duplicate your playlists to create unprocessed "master" versions immediately before AudioSuite processing. That way, you can easily pull the original versions of clips back to the main playlist in their original timecode positions, if that becomes necessary later.

See [Known Issues](#) for additional information about using AAP2 in Pro Tools.

## AUTO-ALIGN POST 2 & ARA2

ARA2 or Audio Random Access (2nd Generation) is a protocol that allows an unprecedented level of real-time communication between a host DAW and a third-party plug-in. In the case of Auto-Align Post 2 (AAP2), the ARA2 protocol allows the DAW to send audio from numerous clips across multiple tracks to the plug-in. There, AAP2 can apply its processing while ARA2 is then used to apply the plug-in-based changes to the audio in the original clips. This method provides the benefits of clip-by-clip, rendered processing while still maintaining the flexibility of an online insert and its ability to be continually adjusted.

The AAX AudioSuite version of AAP2 prints new audio on the track when [Render](#) is pressed. ARA2 instead allows DAWs to store changes in “audio modification” files while the plug-in is running. This way, changes can easily be reversed or modified, even at a later date. That said, because of the fluid nature of ARA2 processing, it can also be more volatile than the rendered results of AudioSuite processing. If, for example, the plug-in is accidentally removed before the effects are committed, any work done within the plug-in GUI could be permanently lost.

Likewise, if the project is opened on another workstation that doesn’t have the plug-in, or you share a project with someone else who does not have AAP2, the alignments will not be available. If any aligned or reference clips are moved or deleted, the alignment for the affected clips will be invalidated when reloading the project on a workstation where AAP2 is available. **For that reason, if the desired alignment is achieved, it is wise to “print” the effects of ARA2 instances of AAP2 to avoid potential data loss.**

Similarly, when duplicating a clip that is currently being aligned to a [Reference Track](#) by AAP2, the alignment will be lost if the reference is not also duplicated. That clip will display “[Alignment Invalidated](#)” within the AAP2 GUI. To avoid this, bouncing the clip will create a new audio file which will no longer need to be compared to the [Reference Track](#).

## TO USE ARA2 VST PLUG-INS WITH...

### PRO TOOLS (2024.6 or later):

To align your audio tracks, select all the tracks you'd like to align by clicking on the track's name in the Edit Window. You can click on the first track, hold 'Shift', and click on the last one to select all tracks in between. To add single tracks, hold 'Command' (mac) / 'Ctrl' (windows) and click on the track names. Hold 'Option' (mac) / 'Alt' (windows) + 'Shift', click on the Elastic Audio Properties menu of any selected track, and select Auto-Align 2. Click 'Align'. You can use the master on/off switch to hear the before and after of the aligned tracks. If you would like to save CPU resources, enhance session portability, or perform additional ARA or elastic audio processing, you can render your audio. To do this, use the tracks' ARA plug-in selector, choose either 'None' or a different plug-in, and then select 'Commit'.

### NUENDO/CUBASE (10.0.30 or later):

Select the clips that you wish to align, as well as the clips that you intend to use as a reference track. On the Info Line, under "Extension", there should be a drop-down menu of ARA2-enabled plug-ins. Select "Auto-Align Post" from that list. A nested instance of the plug-in should open in the Editor pane.

### STUDIO ONE (4.6 or later):

Select the clips that you wish to align, as well as the clips that you intend to use as a reference track. From the "Effects" tab in the Browser, find the "Sound Radix" folder and locate "Auto-Align Post". To run the plug-in in ARA2 mode, Option+Drag the plug-in onto one of the selected clips. A nested instance of the plug-in should open in the Editor pane.

### REAPER (6.0 or later):

Insert Auto-Align Post 2 plug-in instances on the tracks you wish to align, as well as on the reference track. When you open any instance of the plug-in, all tracks that have Auto-Align Post 2 inserted on them will appear in a single plug-in instance.

See [Known Issues](#) for additional information about using AAP2 in REAPER.

## ARA2 GUI MAP

The ARA2 GUI Map is broken into two diagrams with one focusing on the Main Controls and the other focusing on different Display Functions.



Figure 2A - Main Controls

### FIGURE 2A:

- Reference Track:** A Reference Track is a track to which the phase of other clips is aligned. This icon identifies any clip that is currently being used as a Reference Track. When clips are selected within the Auto-Align Post 2 GUI, the Reference Track indicator for any other track that could be used as a Reference Track for those clips will blink. Clicking one of them will initiate Auto-Align Post 2's processing and align the selected clips to the chosen Reference Track.
- Time Mode:** Chooses the method by which selected clips will be aligned to the [Reference Track](#):
  - Dynamic Mode:** Makes continually varied phase and timing adjustments throughout the selected clip(s).
  - Static Mode:** Applies a timing shift of a singular value to each selected clip.
 For more information about these two options, please refer back to "[Dynamic vs. Static Operation](#)" on [page 5](#) of this manual.

**3. Phase Mode:**

1. **Spectral**: Applies multi-band phase rotation to best match the phase in all frequencies.
2. **Polarity**: Disables the all-pass filters and instead uses polarity flips, when appropriate, to correct any polarity discrepancies encountered.

**4. Waveform Comparison:** This shows the waveforms of the selected audio and [Reference Track](#) overlaid on top of one another.

- o **Pink**: Represents the waveform of the [Reference Track](#).
- o **Teal**: Represents the waveform of the audio that is being processed.
- o **White**: Represents areas where both waveforms overlap.

**5. Phase Correlation Meter:** This shows the positive, negative, or neutral phase relationship between the selected audio track and its [Reference Track](#).

- o A positive value indicates that the signals would add if combined.
- o A negative value indicates that cancellation would occur if the signals were combined.
- o A null (centered) value indicates that the two signals would not have significant interaction if combined.

**6. Mode Indicator:** As different clips within the same plug-in instance can be aligned with different [Operating Modes](#), this indicator displays which [Time Mode](#) and [Phase Mode](#) each clip is using for alignment. The inner dot represents the [Time Mode](#), while the outer circle represents the [Phase Mode](#).**7. Reference Track Indicator:** As different clips within the same plug-in instance can be aligned to different [Reference Track](#), this indicator displays which track each clip is referencing for alignment.**8. Edit Menu:** Accesses functions to make quick global selections and adjustments.

- o **Clear Alignment**: Removes processing from the audio modification file and reverts alignment.
- o **Select All**: Selects all clips within the Auto-Align Post 2 plug-in GUI.
- o **Deselect All**: Deselects all currently selected clips.
- o **Select DAW Selection**: Any clips selected in the host DAW arrangement are selected within the Auto-Align Post plug-in GUI.
- o **Invert Selection**: Selects the opposite of the currently selected clips.
- o **Select Regions Currently Analysing**: Selects any region that is currently being analyzed for processing.

- **Handles Length:** Typically, the clips in your timeline have been trimmed down from longer video and audio files. If you were to extend the boundaries of a processed clip you could reveal unaligned (original) audio. Because of this, AAP2 provides the option to align additional audio before and after the current clip.

It's worth mentioning that this setting is internal to AAP and isn't linked to handles settings of the host.

9. **Power Button:** Bypasses or un-bypasses all Auto-Align Post 2 processing.

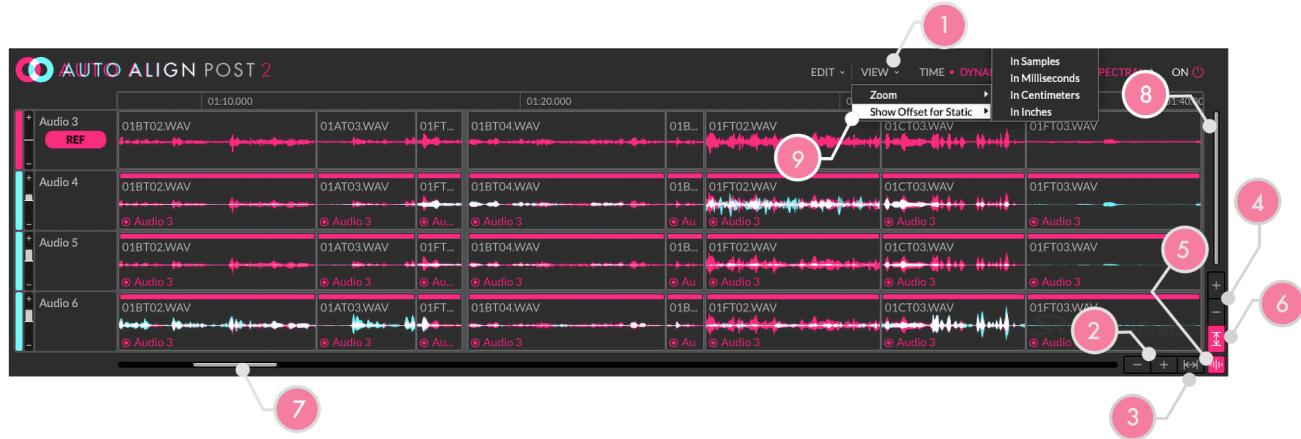


Figure 2B – View Options

## FIGURE 2B:

- View Menu:** Accesses different zoom functions and settings that determine how the plug-in will behave when navigating through the plug-in GUI or DAW arrange window. Most of the functions within the **Zoom Submenu** can also be addressed with buttons in the bottom-right corner of the plug-in GUI.
- Zoom In / Zoom Out:** Zooms horizontally within the plug-in window.
- Auto-Zoom:** When “Horizontal Zoom to Fit” is enabled, all clips are automatically scaled horizontally to fit and/or fill the plug-in window. If the plug-in window is scaled, or additional clips are imported into the plug-in instance, the plug-in will automatically rescale the clips to fit the window.

When “Horizontal Zoom from Host Selection” is selected, the clips within the Auto-Align Post plug-in window which correspond to the clips selected in the DAW’s arrange window are scaled horizontally to fill the plug-in GUI. When this option is selected, the Auto-Zoom button’s background turns grey, but the icon lights up in pink, indicating that “Zoom from Host” is selected.

- Zoom In / Zoom Out Vertically:** Grows and shrinks the track heights within the plug-in window.
- Waveform Height:** Clicking this button enables “Zoom to Peak” which automatically adjusts waveform heights so that the loudest peak on each track reaches the top of the track display. Keep in mind that this is calculated per track, not per clip. Also, remember that this is just a visual adjustment, and has no effect on actual gain.

If you click and hold on the **Waveform Height** button, it will turn into a waveform height slider, allowing continuously variable adjustments. To incrementally increase or decrease waveform height, use the “Zoom In/Out On Waveform Vertically” option from the **Zoom Submenu**.

6. **Vertical Zoom to Fit:** When enabled, all tracks are automatically scaled vertically to fill and/or fit in the plug-in GUI. If the plug-in window is scaled, or additional tracks are imported into the plug-in instance, the plug-in will automatically rescale the tracks to fit the window.
7. **Horizontal Slider:** Slide to navigate horizontally through the plug-in's timeline. Notice how the slider bar automatically scales relative to the horizontal zoom setting.
8. **Vertical Slider:** Slide to navigate vertically through the plug-in's tracks. Notice how the slider bar automatically scales relative to the vertical zoom setting.
9. **Show Offset for Static:** When processing a clip in [Static Mode](#), this setting changes the [Mode Indicator](#) from a simple label to instead show the amount of delay compensation being applied. This value can be displayed in:
  - o Samples
  - o Milliseconds
  - o Centimeters\*
  - o Inches\*

\*Distance values are estimated by calculating the temporal phase shift and applying the standardized speed of sound (343 m/second or 1130 ft./second). The actual speed of sound is greatly affected by temperature, so this is only an estimate.

Naturally, “Show Offset” is not available when using [Dynamic Mode](#), as the phase shift will vary within the clip, so no singular value applies.

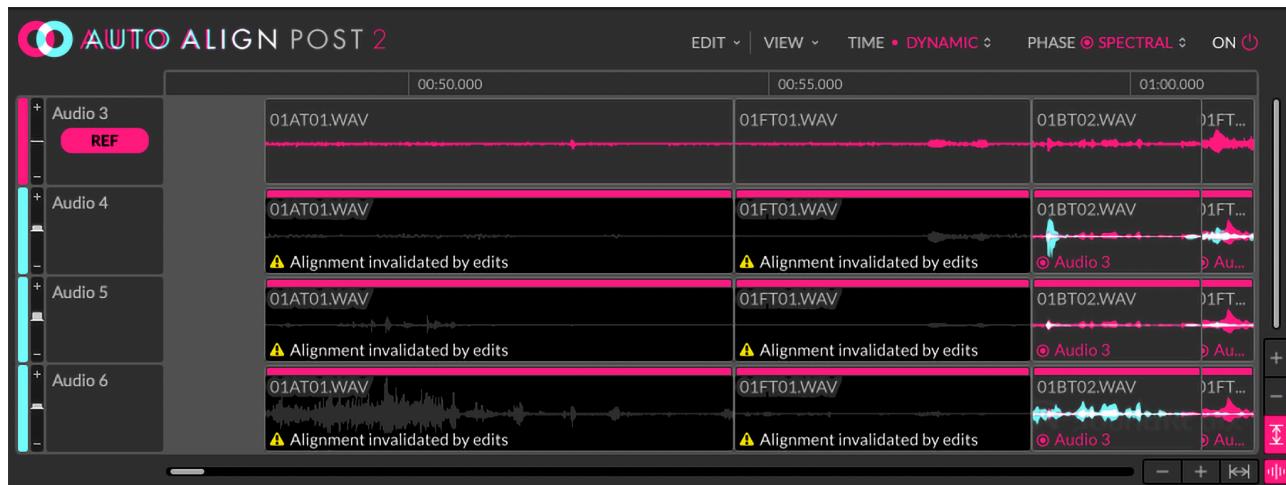


Figure 2C – Invalidated Alignments

## FIGURE 2C:

Auto-Align Post 2 uses ARA2 to reference clips on audio tracks and then returns processed audio back into those clips in real-time. Changes to the lengths of clips in the DAW tracks are automatically recognized and reflected in the Auto-Align Post 2 plug-in window. Likewise, if the reference track and all aligned tracks associated with it are moved in the timeline, the plug-in will automatically react to that.

There are some cases, however, that complicate matters: The reference track may be nudged, but not the tracks that are being aligned to it, or vice versa. A clip might be dragged on top of a portion of the reference track. In these cases, Auto-Align Post 2 will not automatically reanalyze and update its processing. Instead, the user is notified that a change in the DAW timeline has occurred with the above warning “Alignment invalidated by edits.” You’ll also notice the dark background, faded-out waveform and warning message in the affected clip calling attention to the fact that action is required by the user.

When this occurs, you can simply select the affected clips and (re)select the [Reference Track](#) to which you would like to align them. You could also select the affected clips, right-click one of them and choose “Clear Alignment(s)” or choose [Clear Alignment](#) from the [Edit Menu](#), and then start over.

Keep in mind that ARA2 processing is stored in the audio modification file. Because of this, if you remove or alter a clip in the DAW arrangement, the original is still saved in that audio modification file and will be restored automatically if the arrangement is reverted. When these currently unused processing alternates exist, you will see the “Clear Unused” button appear. Pressing it will clear them in order to clean up the audio modification file.

# PREMIERE PRO AND DAVINCI RESOLVE STUDIO INTEGRATION

## OVERVIEW

You already know that combining sound from multiple microphones can cause “phaseyness” and cancellations. You’ve certainly heard it. And as you may know, part of that comes from time arrival discrepancies as sound hits the boom and each lav (or planted mic) from different distances. High-pass filters (HPFs) on production recorders, wireless kits and camera inputs can also cause phase shifts that are not a function of time and are not identical on all sources.

On a film shoot, these issues are further complicated when talent moves during takes, causing the relative distance between lavs and the boom to constantly change. Because of this, nudging the audio between microphones into time or flipping polarity ( $\otimes$ ) may seem to solve the problem at one moment, but then things fall apart again over time. To meet this problem, AAP2 can continually analyze time and phase discrepancies between microphones and dynamically adjust the audio to correct it. Think of it like racking focus, but automatically. Okay, like autofocus... for sound... in post.

The result is that instead of having to choose between using the boom *or* the lav, you can now use any number of combinations of mics without having the typical phasing and chaos. No, this will not solve other problems like background noise and clothing rustle. But what if, for example, you have to choose between a muffled lav *or* a roomy boom? Instead, with the two mics locked in phase, you can dial in a balance of the two. The lav’s tight low end and midrange, accompanied by a touch of the detail and ambience from the boom can create a very usable third option that was never really practical before.

## PREMIERE PRO OPERATION

So how do you use it? First of all, when you install AAP2, all of the DAW versions, as well as the Premiere Pro version, will be installed. For this reason, you will probably see the VST plug-in listed with your audio effects, but that is not how you want to use it. Instead, use the AAP2 extension. If you've never worked with extensions in Premiere, simply click on the "**Window**" menu, and when it drops down, select "**Extensions**" and you'll see "**Auto-Align Post 2**" in the list. Upon choosing it, the GUI will open in a pane of your window layout or you can pop it out to its own floating window.

From there, operation is pretty simple. All you have to do is choose one audio source to which the other mics will be align to (called the [Reference Track](#)) and then show the plug-in which clips you want to align to that reference. A boom mic is typically a good choice because it will likely have a decent amount of audio from each speaker, giving the plug-in a consistent reference when aligning the lavs. A camera's audio track could also be a good choice if it was recorded with a scratch mic, but if it was fed audio from the sound mixer, it could already have a boom and lav summed together with a chaotic phase relationship. This would cause erratic phase alignments and should be avoided.

One other consideration would be to make sure that you apply AAP2 to a consistent track layout. If you've already deleted the boom from certain clips, it obviously won't be available for the lav's to reference it. Or if overlaps have pushed audio onto an additional set of audio tracks, you'll have to account for that, knowing that there are now two tracks with boom and different lav tracks correspond to each of them.

For these reasons, we recommend processing when everything is as uniform as possible, so ideally, this would be done when you're stringing out your dailies. When you're getting organized, using PluralEyes or Premiere's native sync tool to lay out clips with multi-channel audio, this would be the optimal point to add this into your workflow. If boom is on "Track 1" across all of your clips, simply set the [Reference Track](#) to "Track 1", select all of the clips in the stringout sequence and hit [Render](#). Grab a cup of coffee and by the time you're back, all of your audio will be pleasantly aligned.

See [Known Issues](#) for additional information about using AAP2 in Premiere Pro.

## PREMIERE PRO GUI MAP

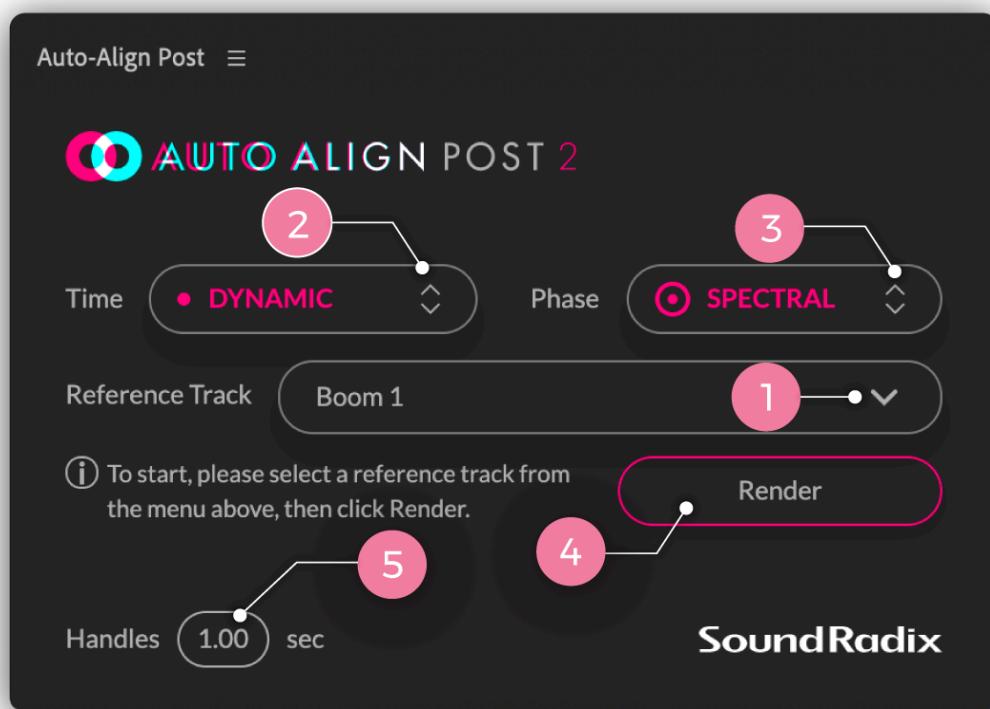


Figure 3A – Premiere Pro Main Controls

## FIGURE 3A:

1. **Reference Track:** Chooses the primary audio source to which the phase and timing of the other microphones will be aligned.
2. **Time Mode Selection:**
  - **Dynamic Mode:** Makes continually varied phase and timing adjustments throughout the selected clip(s).
  - **Static Mode:** Applies a timing shift of a singular value throughout the audio of each selected clip.
  - **Off:** Disables corrective time-stretching, allowing **Phase Mode** to be used exclusively.
3. **Phase Mode Selection:**
  - **Spectral:** Applies multi-band phase rotation to best match the phase in all frequencies.
  - **Polarity:** Disables all-pass filters and instead uses polarity flips, when appropriate, to correct any polarity discrepancies encountered.
4. **Render:** Applies AAP2's processing to the selected clips, aligning their audio to the audio in the [Reference Track](#).
5. **Handles:** Typically, the clips in your timeline have been edited down from much longer video and audio files. If AAP2 were to merely correct the portion of audio that is visible, you could reveal additional time/phase issues at a later time, if you were to extend the boundaries of a processed clip. Because of this, AAP2 processes additional audio before and after the current clip's start and end. Rather than processing the entire original audio file, AAP2 can truncate the processed audio while still including extra "handles" around the clip. You can set the handle length here, in seconds.

## DAVINCI RESOLVE STUDIO OPERATION

In DaVinci Resolve Studio, Auto-Align Post 2 is available as a Workflow Integration Plugin.

If you've never worked with Workflow Integration Plugins in DaVinci Resolve before, simply click on the “**Workspace**” menu, go to “**Workflow Integrations**” and you'll see “**Auto-Align Post 2**” in the list. Upon choosing it, the GUI will open.

**TIP:** If you're using DaVinci Resolve in Full Screen in macOS, Exit Full Screen by clicking the green arrow on the upper left corner of the screen, and press Command + Tab to overlay Auto-Align Post 2 on top of DaVinci Resolve.

From there, it's simple: In the **Reference Track** box, choose one audio source for the other mics to align with. Then, select the tracks you want to align by checking the box next to each track's name.

A boom mic is typically a good choice because it will likely have a decent amount of audio from each speaker, giving the plug-in a consistent reference when aligning the lavs. A camera's audio track could also be a good choice if it was recorded with a scratch mic, but if it was fed audio from the sound mixer, it could already have the boom and lav mics summed together with a chaotic phase relationship. This would cause erratic phase alignments and should be avoided.

One other consideration would be to make sure that you apply AAP2 on a consistent track layout. If you've already deleted the boom from certain clips, it obviously won't be available for the lavs to reference. Or if overlaps have pushed audio onto an additional set of audio tracks, you'll have to account for that, knowing that there are now two tracks with boom and different lav tracks correspond to each of them.

For these reasons, we recommend processing when everything is as uniform as possible, so ideally, this would be done when you're stringing out your dailies. If the boom is on “Track 1” across all of your clips, simply set the **Reference Track** to “Track 1”, select all of the tracks that contain other microphones relevant to that reference and hit **Render**. Grab a cup of coffee and by the time you're back, all of your audio will be pleasantly aligned in new tracks, the original tracks will be muted now to indicate they were aligned.

*(Note: Auto-Align Post 2 will also appear in your plug-ins list under Fairlight, but it won't work as an insert plug-in since it requires Audio Random Access (ARA). Please use the Auto-Align Post 2 Workflow Integration Plugin as described.)*

## DAVINCI RESOLVE STUDIO GUI MAP

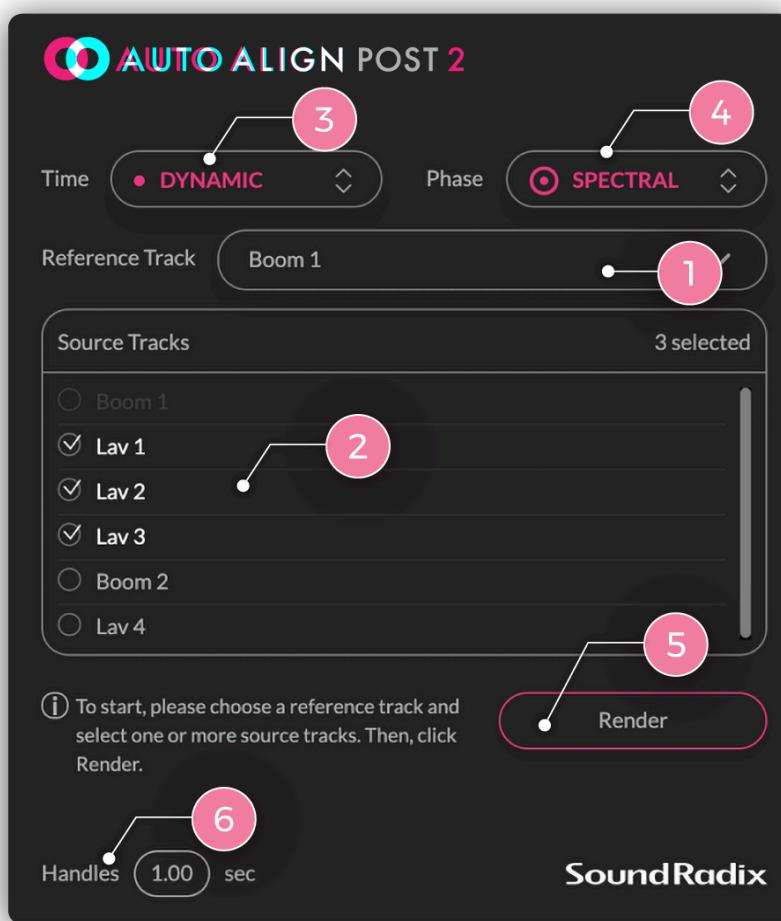


Figure 4A – DaVinci Resolve Studio Main Controls

## FIGURE 4A:

1. **Reference Track:** Chooses the primary audio source to which the phase and timing of the other microphones will be aligned to.
2. **Source Tracks:** Choose the tracks you wish to align by checking the check box next to the track's name. You can align multiple tracks in one go as long as they share the same Reference track.
3. **Time Mode Selection:**  
**Dynamic Mode:** Makes continually varied phase and timing adjustments throughout the selected track(s).  
**Static Mode:** Applies a timing shift of a singular value throughout the audio of the selected track(s).  
**Off:** Disables corrective time-stretching, allowing Phase Mode to be used exclusively.
4. **Phase Mode Selection:**
  - a. **Spectral:** Applies multi-band phase rotation to best match the phase in all frequencies.
  - b. **Polarity:** Disables all-pass filters and instead uses polarity flips, when appropriate, to correct any polarity discrepancies encountered.
5. **Render:** Applies AAP2's processing to the selected track(s), aligning their audio to the audio in the Reference Track.

**Handles:** Typically, the clips in your timeline have been edited down from much longer video and audio files. If AAP2 were to merely correct the portion of audio that is visible, you could reveal additional time/phase issues at a later time, if you were to extend the boundaries of a processed clip. Because of this, AAP2 processes additional audio before and after the current clip's start and end. Rather than processing the entire original audio file, AAP2 can truncate the processed audio while still providing handles. The length is set here in seconds.

## USING THE CONSTANT TIME SETTING IN PREMIERE PRO AND DAVINCI RESOLVE STUDIO

In nearly every imaginable case, you can leave the default settings for [Time Mode](#) and [Phase Mode](#). Let the plug-in do the thinking. There is, however, one other handy use for AAP2. Sometimes you'll notice that when you import audio from a production sound recorder and sync it to your timeline with timecode, the edges of the audio tracks will line up correctly with the video clips, but the waveforms are all slightly out of sync from the camera reference track. This is often due to idiosyncrasies in the way that devices start creating audio files, without always making sure that they begin recording right on the edge of a timecode frame. If you notice this and want to correct it, you don't need the plug-in to do all of the complicated analysis of phase calculations. In this case, you can simply set the camera audio as the [Reference Track](#), set the [Time Mode](#) to [Static Mode](#), set the [Phase Mode](#) to [Polarity](#). Select all of the clips, hit [Render](#), and the plug-in will quickly nudge all of the sound recorder's audio to sync with the camera audio.

## KNOWN ISSUES

### ARA:

- Audio files cannot be shared between multiple clips.

## PRO TOOLS

- [AudioSuite] In Pro Tools 18.7.0.201, [Multi-Input Mode](#) in AudioSuite plug-ins is broken for individual mono channels. This means [Multi-Input Mode](#) works incorrectly and similarly to [Mono Mode](#), processing one channel at a time rather than as a sample-locked group. Stereo and Surround channels are working properly and can be used as a workaround for processing mono channels in [Multi-Input Mode](#). This has been fixed in [Pro Tools 2019.5](#).
- [AudioSuite] Due to the current design of Pro Tools, AudioSuite plug-ins do not receive side-chain input for audio "handles." For more on this, read [Handle Length](#) on page 14.
- [AudioSuite] In order to avoid wrong side-chain input, make sure your audio tracks are **not** in *Playlists* view.

## REAPER

- "Release audio files in background" can disrupt the proper functionality of Auto-Align Post 2. This function is enabled by default, so make sure to disable it under:

Preferences -> Set Media Events Offline when Application is not Active

## PREMIERE PRO

- When working with multiple clips in Premiere Pro, it's important to keep in mind that the undo function is limited. This means that if you make multiple changes and want to undo them all, it may not be possible to do so. To ensure that you can always go back to the original version of your audio tracks, we recommend creating an alternate sequence or duplicating the original audio tracks in your sequence before making any changes. This way, you'll have a set of backup tracks in case you need to revert to the original version.
- Currently, Multi-channel (PolyWav) files are not compatible with Auto-Align Post in Premiere Pro. If you're working with multi-channel files, select all the audio clips you wish to align, including the Reference clips, right-click, select '*Render and Replace...*' and then apply AAP.
- Extension isn't showing up if installed before Premiere Pro was installed.  
*Workaround:* Re-install Auto-Align Pro after Creative Cloud and Premiere Pro was installed.

## DAVINCI RESOLVE

- Media items with sample-rate different than project might not play correctly.  
*Workaround:* Convert media items to project sample rate prior to alignment.
- Layered audio clips might be skipped during alignment.  
*Workaround:* From Timeline menu, Flatten Audio Track Layers prior to alignment.
- Embedded AAFs are currently not supported. A workaround can be found here:  
<https://soundradix.freshdesk.com/support/solutions/articles/5000899281>

## ACKNOWLEDGEMENTS

Auto-Align Post 2 uses the following libraries:

- ARA - <https://www.celemony.com/en/service1/about-celemony/technologies>
- Intel® Integrated Performance Primitives - <https://software.intel.com/en-us/intel-ipp>
- JUCE - <https://juce.com>

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For their contribution, invaluable input, and support of Auto-Align Post's development.  
Gentlemen, you rock!

Sound Radix:  
<https://www.soundradix.com>

Technical Support:  
<https://www.soundradix.com/support>