



ReaClassical

Open Source Classical Music Editing Tools

24

The ReaClassical Manual

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Part I

Preliminaries


1 Introduction

It is important to note that if you already own REAPER then the world of classical editing including source-destination editing (aka 2-, 3-, and-4-point editing), crossfade editing and more are available at no extra cost to you via the freely available ReaClassical system. There's no need to spend any of your hard-earned money on Sequoia, Pyramix or SaDiE in order to make editing precise and efficient. As a classical engineer myself, I can say with certainty that what I am about to share with you covers all my recording, editing and mastering needs. Indeed, I couldn't return to the old way of working at this point. Your mileage may vary and I'd love to hear from you if there are functions that you feel might be missing.

2 Compatibility

ReaClassical runs on any system that is compatible with REAPER (nine architectures!). This includes 64-bit and 32-bit versions of Windows, MacOS and Linux (including Raspberry Pi).

3 This Manual

This PDF manual serves as the official manual for ReaClassical. The latest version is always available directly online or offline from within ReaClassical by pressing .

(for ‘help’). The benefit of the offline version is that it is always in sync with the version of the tools you are using. The structure of the manual is designed to take the user through preliminary remarks, install and update procedures for both ReaClassical and REAPER then a detailed look at workflows from creating a project through to final render. After some brief closing remarks, there follows the appendices (descriptions of all the ReaClassical functions, keyboard shortcut guide, recommended free mastering-grade plugins, system tweaks for all three major OSes, and, finally, a manual install guide mainly for academic purposes).

I highly recommend doing a complete read of the manual and becoming very familiar with appendices A and B.

4 Website

The website reaclassical.org or directly at github.io/chmaha/reaclassical serves as the entry point for new users. From here you can read about key features, donate to the cause, read this PDF manual, installation instructions, navigate to the ReaClassical community thread and more.

5 REAPER Community

The community thread plays an important role in the development of ReaClassical. Not only is it a place for users to suggest feature requests and point out bugs but also discuss more general classical music recording, mixing and mastering techniques. It also serves as something of a development blog as I not only announce the regular releases but also document the under-the-surface details for those that are interested.

6 Ways to Contribute

The most important way users can contribute to the development of ReaClassical is to actually use the tools! I makes me happy to know that engineers can make whole professional-sounding and technically accurate masters from ReaClassical. Another is to suggest features or let me know about bugs. You can either do this on the thread or via the Issues page on the ReaClassical github. Finally, I'd be glad of any monetary donations. You can use PayPal, Liberapay or Stripe to do so.

7 Source Code

The source code for ReaClassical, the mastering grade 'RC' plugins, this manual and the website can all be found here. ReaClassical is GPL-3.0 licensed.

8 Development Style

Due to working on github and releasing the functions via ReaPack, I have the ability to push bugfixes and new features very quickly into an existing ReaClassical install. Often bugfixes happen within minutes or hours of receiving the report. When I dream up new features, the development often happens in rapid fashion over the course of a few days. However, now that ReaClassical has what I consider a mature feature set, I foresee maintenance and occasional bugfixes becoming more central to the process. This will give me more opportunity to work on this documentation, a complete video tutorial series etc. Part of development is also ensuring that ReaClassical continues to operate as expected with the latest REAPER versions. That's not to say there won't be new features appearing! As the REAPER devs add more new features, I will always check to see what might be useful for ReaClassical.

9 Versioning Style

ReaClassical currently uses YY.MINOR.MICRO versioning (e.g. 24.2.1) which is a sort of hybrid between SemVer and CalVer styles. The short year acts as the major version with minor numbers increasing for new features and the micro number increasing for smaller changes such as bugfixes. At the very least the short year gives a sense of how recent the ReaClassical version is. Another popular piece of software that uses the same versioning style is pip.


10 Tools and Languages

ReaClassical works on top of REAPER, the digital audio workstation and utilises Rea-Pack and SWS Extensions. ReaClassical functions are coded using Lua. The installers for MacOS and Linux are shell scripts. The Windows installers are coded in Go. The ReaClassical website uses Skeleton. All coding is done either in REAPER's ReaScript Development Environment, vscode or gedit on Linux. The manual is written in \LaTeX (lyx.org) with the covers designed in LibreOffice Draw. The ReaClassical splashscreen and banner are created in GIMP.

11 Keyboard Shortcuts

When providing keyboard shortcuts, this manual assumes Windows/Linux as the operating system when modifier keys are used. MacOS users should use the typical standard substitutions.

12 Changelog

The changelog for ReaClassical functions can be found by double-clicking on the ReaClassical package in ReaPack and navigating to the ‘History’ tab. Whenever you sync ReaPack via  or the ReaClassical_Updater function, this information should also appear automatically. For all updates including those not related to the functions themselves, a changelog can be found in the release notes.

Part II

Installation & Updates

13 Install

13.1 Easy Complete Portable Installation (recommended)

1. Follow the installation instructions here. Simply run where you would like the ReaClassical folder to be created.
2. Start REAPER.
3. Follow the update instructions on the following page to get the latest and greatest versions of the ReaClassical functions, toolbar and keymap.

Note that if the ReaClassical folder already exists, the installer will automatically add a unique suffix to ensure nothing is overwritten.

13.2 Just The Scripts and Plugins?

Install both ReaPack and latest bleeding edge SWS Extensions if you haven't already.

Import my index.xml into ReaPack (see the ReaPack user guide if you are unsure how) and search for 'ReaClassical' for the ReaClassical metapackage and 'RCPlugins' for the classical jsfx plugins. Note that out of the box this does *not* give you the full benefits of ReaClassical which include keyboard shortcuts, custom toolbar etc but does include ReaClassical themes and a project template which you should use whether doing classical editing. It's an easy way to start if you are already familiar with ReaPack and SWS and want to check out source-destination editing etc. Note that you *do* need SWS





installed for the functions to work as expected. You can follow the update instructions on the current page to grab the custom toolbar and keymap but please heed the warning about using the ReaClassical_Updater function as answering 'yes' to either of the questions will overwrite configuration files.

13.3 Manual Installation & Tweaks

For a manual installation (ideally for educational value only or if you already have a heavily-customized REAPER setup and wish to add all or just parts of ReaClassical) see Appendix E.

14 Update

14.1 Updating an Existing ReaClassical Portable Install

To update just the functions, use   . To update the functions and also update/reset the custom toolbar and keymaps to be in line with a standard ReaClassical portable install, run the handy ReaClassical_Updater function found in the actions menu via . This will sync ReaPack to get the latest ReaClassical functions then offer to overwrite your toolbars and keymaps with ReaClassical portable install defaults. **DON'T do this if you have your own custom toolbars or keyboard shortcuts as they will be overwritten!** However, as of 24.8.7 any files will first be backed up (e.g. *reaper-kb.ini.backup*). Obviously if you run the updater twice before recovering them you will lose your original files.

14.2 Updating REAPER



Simply use the shortcut  +  to open the REAPER update utility.



Figure 1: REAPER Update Utility

Either click on the main or pre-release version you are interested in or click on one of the clock icons to select from previous releases. Despite the REAPER developers having a track record of excellent compatibility across even major versions, I recommend sticking with the tested version of REAPER noted here to minimize any issues of compatibility.

Part III

ReaClassical Workflows

15 Creating & Setting Up a Project

When you start REAPER/ReaClassical from a default portable install, you'll see an empty project with ReaClassical project defaults. The first thing you should do is save it via **Ctrl** + **S**.

15.1 Project Settings

You can open the project settings by pressing **P** (for 'Project Settings') You shouldn't need to change any settings here. By default, render resampling is set to the highest quality using r8brain free. Media is saved to a 'media' subfolder. The default recording format is 32-bit float wave files. Video frame rate is set to 75 to align with the number of frames per second for an audio CD. You can, of course, fill in the 'notes' section with a title, author and notes as desired.

15.2 Audio Settings

Click on the audio information in the top right of the window or via **O** (for 'options') navigating to **Audio** > **Device**. These settings are operating system dependent. Choice of blocksize etc is also dependent on need and how modern and/or optimised your system is. For general microphone setup, device and recording settings specifically for classical music etc I recommend referring to one or more of the following:

- *Classical Recording: A Practical Guide in the Decca Tradition* by Haigh, Dunkerley & Rogers


- *Recording Orchestra and Other Classical Music Ensembles* by Richard King
- *Recording Classical Music* by Robert Toft
- For a more detailed look at mastering (for any genre of music), I highly recommend *Mastering Audio: The Art and the Science* by Bob Katz.

15.3 ReaClassical Preferences

Pressing **[F5]** brings up the ReaClassical Preferences dialog. The first line sets the crossfade length in milliseconds for all source-destination editing. The next three lines are for DDP creation. The defaults are for a 200ms track offset (to account for older CD players that couldn't play audio immediately after a track search), the INDEX0 length in seconds for when to start a CD player 'countdown' display to the next track (a fun visual trick that is, of course, completely irrelevant for purely digital releases) and, finally, the album lead-out time in seconds (essentially the time on a car CD player before the disc returns to the beginning again). Finally there is a setting for the Prepare Takes function to either use the old random coloring method or the newer color scheme that uses blues for destination material and greens for source material. There will be more on these settings in subsequent sections of the manual. If you are unfamiliar with these concepts, I recommend a quick internet search! If in doubt, just use the default values. It is worth noting that these preferences are set per project.


15.4 Choice of Workflow


The choice between what I refer to as 'vertical' or 'horizontal' workflows will depend somewhat on the complexity of the project. For a quick editing session of, say, a choral piece or short self-standing orchestral piece, a horizontal approach will suffice. For a well-drilled ensemble recording session, I can recommend using the vertical approach. Many classical engineers enjoy using a horizontal approach for recording (potentially the least disruptive and making use of the Take Counter window **[Ctrl] + [J]**) and then




either sticking with that for editing (also making use of the extremely useful Find Takes function ) or, depending on the number of takes, converting to a vertical workflow. Frankly, there are benefits to both routes, and in the end, it simply comes down to personal preference.

15.4.1 Vertical Workflow

In this approach, the source and destination track groups are aligned vertically so that the user doesn't have to shuttle back and forth along the timeline for placing source-destination markers.

When Recording material: To begin with a vertical workflow, press  to set up a destination track group. Whether recording or importing, simply type in the total number of stereo and mono microphone inputs you need. I highly recommend using the first track for the main stereo pair.

When importing material: To begin with a vertical workflow, press  to set up a destination track group and six source groups (don't worry, it's easy to add more if you need them!). Simply type in the number of stereo and mono microphone inputs you need. I highly recommend using the first track for the main stereo pair.

The  function creates six source groups based off the destination track group, and creates a single set of mixer tracks that are shared by the groups. Use these to control volume, panning, polarity, sends and FX across all takes. The function also sets up media item and razor editing grouped by folder. If you need more than the six source groups, simply create them on the fly with the  shortcut. but note that using  (Classical Take Record) creates a new source group as needed after each recording.

A typical scenario: You have vertically recorded, or vertically prepared, multiple takes of a concerto movement with 10 channels. You realise halfway through editing that you want the soloist's microphone to be brought up in volume a little and also panned slightly more to the right to match the position in the main stereo pair. Simply make the change once on the equivalent mixer track!

15.4.2 Horizontal Workflow

In this approach, there is a single track or single group of tracks with the source and destination material laid out from left to right. As mentioned above, for shorter pieces of music this is often a perfectly acceptable approach. With the introduction of the Find Takes function and Take Counter, many will now prefer this workflow.

To begin a horizontal workflow, press **F7** to set up a track group also with mixer tracks (for making changes to volume, pan, polarity, sends and FX). Whether recording or importing, simply type in the number of tracks or microphone inputs you need. I highly recommend using the first track for the main stereo pair. In the event you are making a simple stereo recording, I would still recommend creating a track group consisting of two tracks and simply leave the child track empty and hidden.

If you wish to convert to a vertical workflow, simply press **F8** to create six new source groups.

15.4.3 Naming Tracks

After selecting a workflow, you only need to add track names to the destination group in the arrange window and then pressing **F7** or **F8** will auto-populate the same names to the source groups and mixer tracks. ReaClassical automatically adds Source and Destination prefixes to your chosen track names and are auto-renumbered whenever functions affecting the number of source folders are run (Vertical Workflow **F8**, Duplicate Folder ****, and Classical Take Record **F9**). Tip: Avoid using any colons in your track names and the auto prefixing will work as expected.

15.4.4 The Single Mixer & ‘RCMASTER’ bus

Whatever your workflow preference, as of 24.10, all audio is routed through a special dedicated mixer tracks leading to an RCMaster bus. This allows for independent

volume adjustments on the parent track which is generally used for the main microphone pair. Converting your projects made with an earlier version of ReaClassical is easy. Simply run **[F7]** for horizontal workflows or **[F8]** for vertical workflows. The new mixer tracks and bus will be created and all routing taken care of. Any existing track panel settings (including sends and FX) from the first group are automatically transferred to the mixer tracks.

Any and all track setting changes (volume, pan, phase, FX, sends to @aux tracks, routing to #submixes etc) happen in the mixer tracks. This is identical to the way that Pyramix works with a single mixer being fed by all the source groups. The mixer tracks are always visible in the mixer panel and identified by track names that start with 'M.'. Running **[F7]** or **[F8]** will synchronize the track names from the first folder across the whole project.

The basic rule is to not delete these special tracks. But, if you do by accident, don't worry. Simply run **[F7]** or **[F8]** again! It is also worth noting that aux, submix and roomtone tracks now automatically route through RCMaster on creation and are also automatically updated when older projects are 'upgraded'.

16 Recording

Now that you have decided on a workflow, we can set up the tracks for recording.

16.1 Setting Inputs

There are multiple ways to set recording inputs on REAPER. First is to click on the input at the top of the mixer channel. Second, you can left-click on the meter part of the track panel. Third, you can press **[Alt]+[R]** to open the routing matrix. Once you have set the inputs for the first group, and you chose a vertical approach, simply press **[F8]** to sync these settings to all source groups.

16.2 Headroom







Again, I refer you to the books on classical music production but in general I suggest aiming for around -12dB peaks on the meters. 24-bit recording allows for a lot of headroom so there's no need to push close to 0dB. Adjust the individual faders to balance. Note that in a vertical workflow moving a fader will automatically move the corresponding fader in the other groups too making same-volume auditioning of different takes extremely easy. When using a 32-bit float device with dual AD convertors as an interface (such as the Zoom F-series), ensure that the recording file format remains on the default 32-bit float setting. The recorded levels might seem too low or too high during recording, but they can be easily adjusted afterward in ReaClassical without introducing any extra noise or distortion.

16.3 Classical Take Recording



F9 begins 'classical' take recording mode for whatever parent track is selected. If the parent isn't record-armed (probably the case before you start your first recording of the session), the function will first simply record-arm the group so you can usefully monitor incoming signal. On a subsequent press of **F9** recording begins. To stop recording, press **F9** again. In horizontal workflow, the key press will maintain record arming and will begin recording on a subsequent press. In vertical workflow, this key press also automatically moves to, solos and arms the next available group so that recording can begin immediately on the next button press. ReaClassical will automatically create new groups as required. To manually add more destination groups when not recording, press ****. During this mode you should use the Takes Counter window **Ctrl**+**Enter** to track the upcoming take number (in green) and take number during recording (in red with recording circle). You can right-click on the window to optionally override the automatic numbering and set a take number to increment from in addition to optionally setting a session name to act as media subfolder (which is automatically recalled when the window is reopened). You can left-click to recalculate the track count if you have removed some unused files from the project path. The calculated upcoming

take number factors in unused files in the project path so as to avoid any file-naming conflicts. With manual override off(=0), switching back to an existing session will also automatically set the correct incoming take number. Please read the description of the function in Appendix A for best practices.







16.4 General Recording

To record more generally (say a separate single mono narration track or similar), use the built-in REAPER record function arm the folder (either manually by press-holding on the first record button and sliding the mouse down through the tracks or via the handy  +  shortcut) and then either press  +  or use the red record button. During this mode you should still use the Takes Counter window  +  to track the upcoming take number (in green) and take number during recording (in red with recording circle).




16.5 Adding a New Microphone Mid-Recording Session

As of ReaClassical 24.9 you can add a track to all folders in the project at once by using the shortcut  + . It will prompt you for a name and then add a new track with that name to the end of each group. This also works for a single folder while working in a horizontal workflow.

16.6 Re-ordering tracks

In both horizontal and vertical workflows, you can use  +  +  and  +  +  on a selected child track in the first group to quickly re-order all the groups at once including the mixer tracks.

16.7 Deleting tracks

In both horizontal and vertical workflows, you can use  +  +  on a selected child track in the first group to quickly delete in all the groups at once including the mixer tracks.



16.8 Disabling Channels During a Recording Session

In a typical recording session, the musicians with the least to record are often allowed to leave the session early once their work is completed. If they were individually recorded using a spot microphone, it wouldn't make sense to continue recording on that channel. In ReaClassical there are two main ways to disable a channel. In a horizontal workflow using a single folder, it is no hassle to simply un-arm the desired track(s). For a vertical workflow with multiple folders, the task could end up being time-consuming with potential for error. So, the recommended ReaClassical way, both easy and visually obvious, is to select the desired tracks in the destination group, right click and choose 'lock track controls'. The tracks are then greyed out. Then sync using F8 and the same tracks are locked in every group. Whether or not the tracks were previously record-armed, those tracks will no longer be involved in the recording.

17 Importing

Read this section if you recorded using a different DAW, portable recorder or are acting solely as editor and have the audio ready to import into ReaClassical.

17.1 Importing Media

Set up the horizontal or vertical workflow as desired. Then either drag the audio into the REAPER window or select  

For classical music purposes, you can then choose whether to insert in the same time position on separate tracks or sequentially on a single track. For recordings with multiple takes using separate files, I recommend inserting/dragged one take at a time onto separate tracks on either the source group or first destination group. Once everything is imported you can then drag sets of tracks to the different source groups as desired. If you have a best take that will be the basis of the final edit, place this on the top destination group tracks.






17.2 Multi-Channel Audio Import

If you use a portable recorder such as a MixPre, you might have a multi-channel combined file. ReaClassical includes a special function for converting these into a stereo pair + mono track set. Import your multi-channel media using a single regular track (for a horizontal workflow) or multiple regular tracks (for a vertical workflow). Then, simply select all your multi-channel sets and press **F10**. Answer yes to the prompt that appears if the first two channels should be treated as stereo interleaved (i.e. they represent your main pair). Depending on the choice made, the number of tracks in the resulting folder(s) will adjust accordingly. If the user selects ‘no’ to keep all tracks mono, the folder track is left empty so that the Prepare Takes **T** function is able to create a muted guide track (more on this later!). Obviously if you decide to move to a vertical workflow after exploding using a single track, you can always use **F8** to create your source folders then drag the media to where you want them. Note that it is important to select all the items you want to explode as the function can only be used once (prior to folders existing). If you need to bring in new takes after editing has started, simply use the function on an empty project tab then copy or cut them into the original project tab into the desired folder on the timeline.


18 Navigating a Project

In addition to built-in REAPER functions, ReaClassical uses a series of shortcuts to help you easily navigate your classical project. Important: I always make some dedicated time post-recording to get a lay of the land, tidy up the digital notes I took during the session and perform a backup on an external drive as soon as possible.





18.1 Whole Project

Use  (backtick) to see the whole project horizontally and/or  +  to see everything vertically. I chose to separate these functions because one of the axes (often the vertical) is set exactly how you need for editing and it would be a pain to have the axis reset each time. You can also go to the start or end of the project by pressing the  or  key respectively.

18.2 Finding Takes

Use  (enter/return) on the main keyboard or numpad if you have one to quickly search for a take based on the underlying filename of the media item. This will work for any filenames system that uses numbers before the file extension such as ‘main_pair-T04.wav’, ‘cello-spot-take_23.flac’ or even ‘ortf_pair(04).wav’ such as created by Presonus Studio One. Note that if the imported or recorded files have zero-padding that is not a problem. If you have used an item to create an S-D edit, searching for a take will ignore these items and move directly to the original sources.

18.3 Items & Markers

You can easily shuffle back and forth between item edges by using the  and  keys. You can move between markers by using the  and  keys (by design given on my

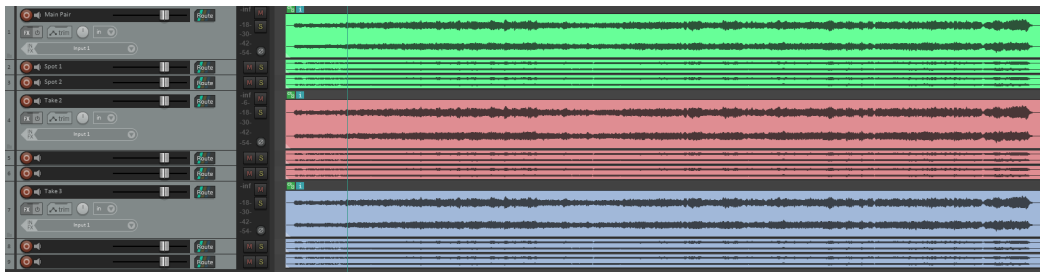







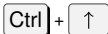
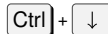


Figure 2: Uncollapsed Track Groups

keyboard they are the same keys that have  and ).  (tab) moves to a selected item's highest peak value which can be useful when applying volume automation as a quick way to transparently 'limit' a stray peak.

18.4 Parents & Children

ReaClassical can hide or show children of track groups. This means that editing multi-track classical music can be as easy as editing a stereo track. When takes have been prepared (see below), all edits are automatically synchronised. Making an edit to the parent track automatically makes the same one to all the children too. To show hidden children select the parent track and press  (for 'display'). To hide, select the parent track and press  (for 'ensconce'). The other benefit is that a whole set of takes can be displayed vertically in the main editing window without too much effort.

18.5 Peaks Display

To adjust the visual zoom of wave peaks, use  +  and  + . This is purely visual and allows for easier editing of quieter sections.

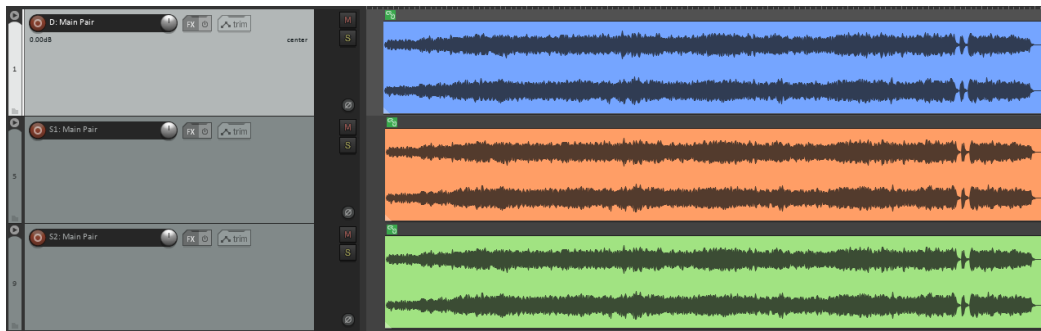


Figure 3: Collapsed Track Groups

18.6 ReaClassical Toolbar

While I designed ReaClassical to be used efficiently with keyboard shortcuts, there is a custom S-D editing toolbar for those that prefer it. However I do highly recommend learning the key strokes as you will find your editing speeds improve dramatically. The floating toolbar is visible by default on a new portable install. To open or close, use the **F6** shortcut.



Figure 4: ReaClassical custom toolbar

From left to right, we have: Destination IN and OUT markers (1, 2), Source IN and OUT markers (3, 4), Delete S-D markers (Ctrl+Delete), S-D Edit (5), 3-point 'Assem-

bly Line' Edit (F3), Insert with Time-stretching (F4), Delete With Ripple (Backspace), Delete Leaving Silence (Ctrl+Backspace), Set Destination Tab Project Marker (ctrl+alt+1/2), Set Source Tab Project Marker (ctrl+alt+3/4), Delete S-D Project Markers (shift+del), and finally ReaClassical Help (H).

18.7 Summary of Track Types in ReaClassical

While some of these will be covered later in the manual, it is useful to give a summary of track types you can currently use in ReaClassical. First, we have the 'regular' group or groups of tracks shown in the arrange window. These are where you record or import takes. You can record-arm tracks and select inputs here (a reminder that names, recording inputs and locked tracks need only be set on the first group and then **F8** can be pressed to sync across all groups. Second, we have the mixer tracks designated via 'M:' prefix. These tracks shown only in the mixer are where you adjust the usual track controls such as pan, volume, phase etc. and also add FX. Their names are populated from those set in the first group of 'regular' tracks in the arrange window. Third, we have aux busses designated via '@' prefix. You can route mixer tracks to these to use as a reverb bus etc. Fourth, we have submix busses designated via '#' prefix. You can route mixer tracks to these as a way to collect together microphones from the same orchestral section etc. Fifth, we have a dedicated room tone track where you can place recorded or generated room tone (more on this in the mastering section). Sixth, we have the 'RCMASTER' bus which leads directly to the master REAPER bus. Here you can gain stage into the master bus, add FX etc. Finally, the master bus itself where again you can set final levels, add FX etc. As mentioned elsewhere, try not to delete the mixer tracks or RCMaster. But, even if you do by accident, simply run **F7** or **F8** to recreate them depending on your chosen workflow.

It's important to maintain the prefixes for the special tracks (@, # and M:) and to retain the RoomTone, Reference and RCMaster track names for audio routing and mixer visibility. However, if you accidentally make improper changes, simply re-sync via **F7** or **F8** to automatically add back missing prefixes and correct naming.

19 Editing

19.1 Introduction to Editing Workflows

Once you have recorded or imported your classical music audio, you are ready to start editing the raw material! Here we talk about the meat and potatoes of the classical editing workflows. Workflows—plural—because I have included different approaches to suit as many tastes as possible within the confines of the REAPER application. I will explain each in detail after this brief introduction. As described previously, you have multiple ways of proceeding. First you can have all your takes lined up in a row horizontally and you place your source in and out markers, destination in and out markers then press a keyboard shortcut to achieve your 2-, 3- or 4-point edit. The second way is to set up your takes vertically and then either use the same marker system to make your edits or use razor edits (my preferred method when working vertically). Whichever option you choose, you will then end up in the crossfade editor view which uses a custom two-lane view with classical crossfade function to make precise edits really easy in REAPER. I don't often use the fade editor dialog that comes with REAPER even though I make it appear as part of the function.

19.2 Marking Edits on your Scores

This is best done using a physical, photocopied score by the conductor or lead musician. I advocate for a “T” system where a large T is inserted into the score at the intended edit point. Either side of the T stem, and under the crossbar, the outgoing and incoming take numbers are written. A wavy crossbar indicates some leeway for where the edit point can be placed. Further notes can be attached underneath the T such as directions for tightening the gap etc.



Figure 5: Marking edits on a physical score

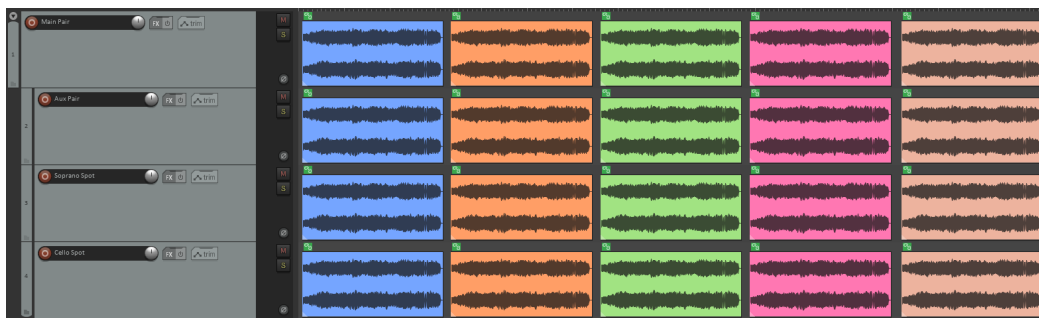


Figure 6: Horizontally Prepared Takes

19.3 Preparing Takes

Whether working horizontally or vertically, you can use the Prepare Takes function. It is intelligent enough to figure out which workflow you are using. Just press **T** (for “Takes”). Super simple! Every set of items comprising a take has changed colour, is now grouped. In addition, source and destination groups are linked or (re-linked) for various types of editing and imported/recorded take names removed if desired.

If Prepare the ‘Prepare Takes: Random colors’ value is set to 0 in ReaClassical Preferences **F5** (the default), for horizontal workflows, two shades of blue are used which also helps show the user where edits happen. For vertical workflows, the destination group again uses two shades of blue and the source groups are colored green. In this way they match the colors of the associated S-D markers. If ‘Prepare Takes: Random colors’ value is set to 1, for horizontally laid-out takes, each complete take is coloured with a different random colour. For vertically laid-out takes, each folder’s items are given a different random colour. This way, however you work, it’s easy to see where edits have come from. Prepare Takes can be re-run at any point to re-sync colors, especially useful when using the default color scheme.

If you imported or recorded all your files in child tracks, the function will additionally

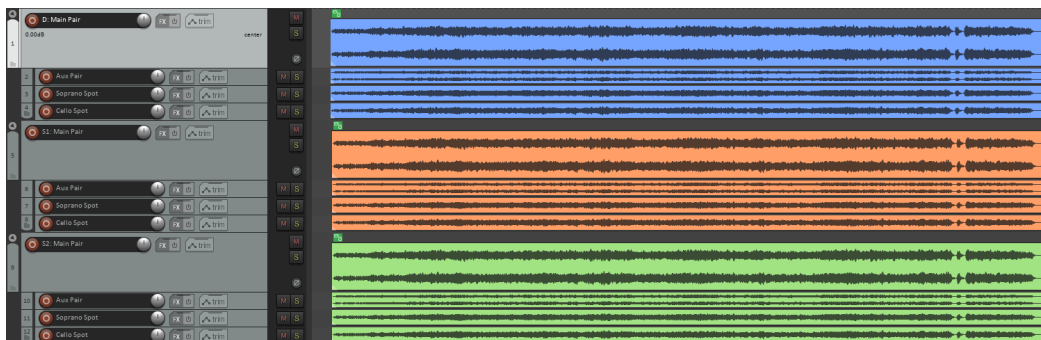





Figure 7: Vertically Prepared Takes

copy all items from each first child track into the folder track and mute them to act as a visual guide track. You will receive a pop-up message if this is the case. In the cases where you might use the function after editing has begun, the destination group will switch to using alternating colors for items so that you can easily tell where you have made edits.







19.4 Auditioning Takes


For horizontal editing, you could use the usual transport shortcuts (spacebar to start and stop playback, for example). However, for both horizontal and vertical editing, it is highly recommended to use the Audition or Exclusive Audition functions to quickly solo only the folder (or track) you are interested in hearing. Just hover the mouse over the parent for the full mix or a child to solo a spot microphone you want to hear and press **A**. This includes any @ aux or # submix track routing in the signal path. You can easily and quickly create your own custom audition mix by engaging solo or mute buttons on the mixer, aux and submix tracks (either with transport stopped or on the fly) and using hover + **A** on the parent track. You can therefore listen to anything from the full mix down to examining just the woodwinds submix or a single reverb bus.

Alternatively, to quickly hear a single track direct (e.g. the solo violin microphone) and without any other routing press  + .

Don't forget that you can quickly jump to your various source takes using .

19.5 Source-Destination Editing

You set your in and out points using special coloured labelled markers via shortcuts  and  (Destination) and  and  (Source). Simply press  to make the 2-, 3- or 4-point edit, depending on how many markers you set. If you attempt to set one of the destination markers inside of an existing crossfade or within 500ms of a xfade or item edge, the function will alert you (pressing OK places the marker anyway). This helps avoid awkward 'sliver' edits that can happen especially if you are zoomed out and placing markers by ear. You can customize the check range via ReaClassical Preferences (). The check range (in milliseconds) is the distance beyond an item edge, fade or crossfade. For example, setting to 0 would only check for placement *inside* a fade or crossfade.

You'll also notice that because you prepared the various takes with colours (and grouping), it is really easy to see which takes compose your final edited tracks. It's worth pointing out that my S/D and classical crossfade functions place the crossfade immediately before the entry and exit points of the pasted audio. The crossfade length and other values can be set on a per-project basis via ReaClassical Preferences (). In practice this means that if you visually set a marker (or edit cursor in the case of the classical crossfade function) immediately before a transient, said transient will sound post-crossfade which is what we generally desire. Often, given this important detail, I don't even need to visit the crossfade editor view.

When using a vertical workflow, make sure you have the source folder selected before you create the source IN and OUT markers. You can do so by clicking on the track panel or on the item itself. This adds the folder number as a prefix to the source marker labels. The various functions will then use this label to know which folder to copy from. This is really useful if you undo the edit in order to tweak the markers by



dragging them. It doesn't matter if you then select other folders/tracks. In the event you use two different folders for the source IN and OUT markers, the functions will prefer the source IN label.

The downside to this workflow when using a vertical approach is that the source and destination markers can get in each other's way visually if the takes aren't somewhat staggered however the process still works as expected. See below for a razor editing alternative.






Optional: If you are worried about accidentally moving markers and items during precise S-D or assembly editing, engage the padlock icon in the topleft of the ReaClassical window. By default with the latest ReaClassical project template, it should prevent manual left/right item movement and marker dragging (while still allowing for S-D editing with ripple). Even though you can't move S-D markers by dragging with this lock mode engaged, you can still use the shortcuts 1, 2, 3 and 4 to change marker location. Just remember to disengage lock mode when you enter the fade editor or else you won't be able to move the right green item of the crossfade!

19.5.1 Multi-Project Tab S-D Editing


If you'd like to S-D edit between various open project tabs you can set both the source and destination 'project' markers via Ctrl+Alt+1 (or Ctrl+Alt+2) for destination and Ctrl+Alt+3 (or Ctrl+Alt+4) for source (essentially the same numbers associated with regular S-D markers). The markers can exist anywhere on the tab's timeline but perhaps the very beginning or end would be good to keep out of the way. The S-D editing itself then works just as for a single tab other than any source markers that are set are not deleted to aid quickly undoing in the destination tab and being ready to reapply the edit. The only rule when using S-D project markers is to ensure that source or destination markers should be paired with the corresponding source or destination project marker. This workflow would, for example, allow you to have multiple project tabs (perhaps one for each symphony movement plus a final 'destination' tab), allowing for both internal editing per tab but after setting the S-D project markers compiling the final edit in the 'destination' tab. To delete all the S-D project markers

press  + . Also, in multi-tab S-D editing, when regular markers are placed, any other existing versions in other tabs are automatically deleted to ensure that only one version of the marker exists at a time across all open project tabs.



19.5.2 4-Point Editing

For this operation, set all four markers using , ,  and . Make the edit with . This is the most useful edit when dealing with classical music or other acoustic music performed without a metronome.

19.5.3 3-Point Editing

For this operation, set any combination of three markers. Again, make the edit with . The missing marker is placed according to the distance set by the existing complete pair.

19.5.4 2-Point Editing

For this operation, there are two possibilities: 1) Set one source marker and one destination marker. Make the edit with . Any missing IN markers are set to the beginning of the timeline and any missing OUT markers are set to the end of the source or destination material. 2) Set both source markers and no destination markers. Make the edit with . Here, the destination markers are set at the exact same positions on the timeline as the source markers. Obviously this operation is only useful in a vertical editing workflow when you can select source material from a different track group. The usefulness of this second option is further reduced if the takes are not vertically aligned and not virtually identical in tempo. On the other hand, it could be an incredibly quick method for editing takes of a hybrid classical piece that is performed to a click track or other recorded steady beat.

19.6 Other SD Functions

19.6.1 Insert with Time-Stretching

Using the ReaClassical_Insert with timestretching function **[F4]**, you can complete a 4-point edit where the material between the source markers is timestretched to fit the length of time between the destination markers. This is really useful when the source material has to fit the destination span exactly, for example when working with visual cues. The timestretch algorithm used will be the one set in REAPER project settings. When there are multiple items in between the source markers, the function will glue the items together before time-stretching. Note that this function can also be used in multi-tab S-D editing mode (see above).

19.6.2 Assembly Line Editing

Sometimes you don't necessarily have a best overall take and it is desirable to build the perfect performance linearly, section by section, measure by measure. In this case, set the destination IN marker with **[1]** and set both source markers using **[3]** and **[4]**. Press the **[F3]** shortcut. A 3-point insert operation will occur and the destination IN marker will jump to the end of the pasted item, ready for the next edit. This means that in order to compile further sections, you now only need set the source markers. Note that this function can also be used in multi-tab S-D editing mode (see above).

19.6.3 Delete / Delete with Ripple

While perhaps not used as often as 3- and 4-point edits, I have created two functions for deletion of material. Delete & Ripple **[←]** (backspace) will delete the material between source IN and OUT markers and ripple material to the right backwards with a short crossfade. Delete Silence **[Ctrl] + [←]** will also delete but maintain the silence without rippling backwards.

19.6.4 Add Source Markers to Edges of Item(s)

Used in combination with Delete / Delete with Ripple, you can quickly set both source markers to the edges of one or more selected items on a parent track via **F12**. This is a time-saver when dealing with potential ‘sliver’ edits i.e. small unneeded leftover edits as a result of multiple rounds of zoomed-out S-D editing. Note that the built-in checks when manually placing destination markers should go some way to alleviating this issue which can easily go unnoticed in other classical music DAWs.

19.6.5 Move / Zoom to S-D markers

To move to any existing S-D markers use **Ctrl** + **1**, **2**, **3** or **4**. To zoom to any of the S-D markers for more fine-grained placement, use **Alt** + **1**, **2**, **3** or **4**. If you have multi-tab S-D editing set up (see 19.5.1), these shortcuts will also automatically move focus to the correct project tab.

19.6.6 Delete S-D markers

To delete all regular S-D markers, press **Ctrl** + **Del.**.

19.7 Razor Editing

Because of the potential for visual overlap of markers, I much prefer the REAPER razor edit functionality for vertical take work. It works a lot like the process shown in this Pyramix video.

While Pyramix also has additional source-destination marker workflows, I couldn’t help but feel that for professional ensembles that manage a high degree of tempo regularity between takes, this method can be extremely efficient. This isn’t the document to introduce REAPER razor edits as there are plenty of resources online if you do a

simple search but here we are only concerning ourselves with creation of the razor area across all our pairs and spot mics (REAPER's default shortcut is the rather uninspiring Alt+Right drag) but thankfully it can become the default editing mode by either using the I shortcut and right dragging or selecting the Razor edit mode on the main toolbar and left dragging.

19.8 Crossfade Editor

Now that you've made your precise edits using S/D workflow or razor editing (no worries if it's a bit rough!), it's time to check things through with a good listen and the help of the crossfade editor view.

While REAPER includes an excellent crossfade editor, it does not reach the same levels as the ones in specialist classical DAWs such as Sequoia and Pyramix. This is mainly due to the inability to see the continued waveforms of the items beyond the crossfade they enter and likewise the previous waveforms of the items that exit the crossfade. The ability to visually align transients and then position the crossfade just before it is absolutely critical (and fun when you have the tools to do it!). So, beyond the standard REAPER crossfade editor what have I provided? Select the left-hand item of a fade, Press **[F]** and you are moved into crossfade editor mode. Here, the first track is given full vertical zoom, the two-lanes for overlapping items is enabled, colored red and green, and the fade editor toolbox appears (I personally position it to hover over the middle of my mixer. Note also that you are automatically centred on the crossfade and can use the mouse wheel to zoom in and out. Press **[F]** again and you exit that mode. If for some reason you accidentally close just the fade toolbox, either open again using action in the action list or, better still, simply close and re-open the fade editor using **[F]** .

So, now you are in the crossfade editor mode, ensuring one or both items are selected, hover your mouse over a blank area and press **[Z]** to automatically mirror extend the waveform view of each item. Essentially, it increases the overlap so you can spot and align the transient you want. My own preferred method of getting the perfect crossfade is to locate the transient I want on the red left item, place the edit cursor just before

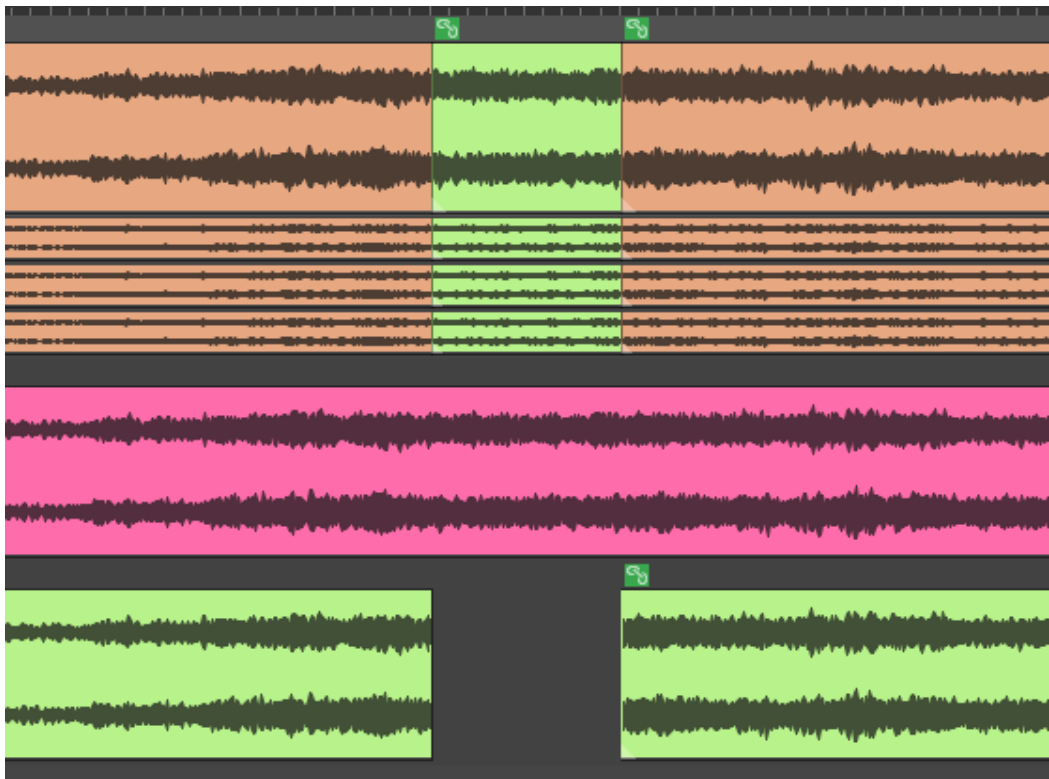


Figure 8: Razor Editing

it, then drag my green right item so that the two transients align. Then I press **X** (classical crossfade) and I'm done! The crossfade happens at the location of the edit cursor (well, just before it as explained above).

I love this method so much that I don't miss Sequoia or Pyramix any more. Here it is in ordered list form:

1. Increase overlap (by hovering mouse either in a blank area or over one of the items and pressing **Z** shortcut to mirror extend the item edges)
2. Find transient in red left item that you want be edit point
3. Place edit cursor just before it
4. Drag green right item to align transients (this automatically ripples all items, markers and regions)
5. Press **X** (classical crossfade)

In reality, this process can be just a few seconds to achieve the perfect edit. In the unlikely event you need to undo, either use the standard **Ctrl** + **Z** combination or simply extend the overlapping item edges again then create a new classical crossfade.

While you could use the auditioning tools in the dialog, I have created something I find quicker and more useful. While the two items involved in the crossfade are selected, try the following:

1. Hover over left item / press **A** to solo audition the left item from mouse cursor to end of item
2. Hover over right item / press **A** to solo audition the right item from start of item to mouse cursor
3. Hover in blank space on left item side / press **A** to solo audition the crossfade from mouse cursor to mirrored position on the other side of the crossfade

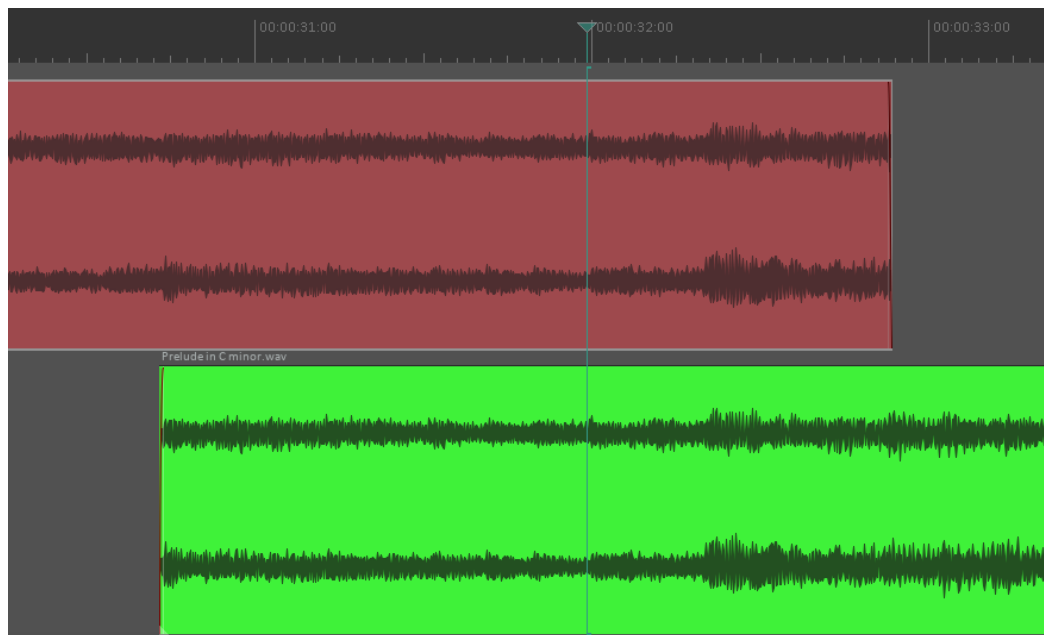


Figure 9: Crossfade Editor View

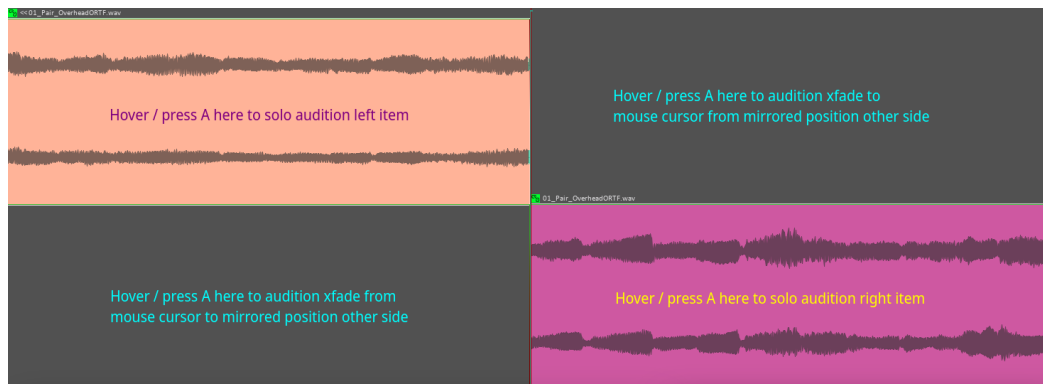


Figure 10: Crossfade Auditioning Tools

4. Hover in blank space on right item side / press **A** to solo audition the crossfade from mirrored position other side to the mouse cursor.

As you'll see, the playback stops using a special marker with `*!1016*` as the label which is executed as a stop command. It is deleted automatically after playback ends. If you try to run the function another time before it has finished, just select new instance if you get a pop-up box. You can stack instances and on completion of the latest run, all instances are removed. Better to experience than describe but it works really well. You'll also see that the edit cursor returns to the middle of the crossfade to aid in mouse scroll zooming keeping the crossfade centred. The mirrored position takes into consideration the overlap of the items so you can have a complicated set of fades and still get an exact mirrored stopping point.

You can shuttle between crossfades using the **Q** and **W** shortcuts. Do **NOT** use the built-in Previous Next buttons on the standard fade dialog box! However, there is still a benefit of having the fade editor dialog in view. You can also tweak the fade using the knobs if you prefer. Center, Start, End and Length knobs are particularly useful here to maintain symmetry. Be aware that the Contents knobs will not ripple markers (but

with the introduction of the Create CD Markers, I highly recommend not bothering to create any markers at this point).

19.9 Other Editing Tips

In my key map, I include all sorts of useful shortcuts to use during editing. As mentioned above, in vertical editing workflows, the Audition **A** or Exclusive Audition **⇧A** + **A** are brilliant for listening to various takes before applying a razor or S/D edit. I can shuttle between items with **Q** and **W** (the same keys perform a more advanced role when in crossfade editor mode), shuttle between markers with **,** and **.** (the same keys with **<** and **>** on them on my UK keyboard), **S** for splitting a long recorded session into takes, **`** (back tick) and **Ctrl+`** for zooming out to the whole project both horizontally and vertically etc. There are plenty more for the mastering end of things so I encourage you to explore.

It is worth noting that all regular markers and regions are ripple edited appropriately when using my source-destination editing functions and crossfade editor. I also introduced the ReaClassical_Lock Toggle function **K** which temporarily locks all source groups and engages ripple-all-tracks mode to enable you to drag destination items and simultaneously ripple markers and regions in the regular arrange view. This allows vertical source groups to retain their independence yet still give ripple-all-tracks behaviour which is useful for destination album track spacing etc. However, I consider this function deprecated given I strongly feel that the Create CD Markers function is now the ultimate way to deal with CD tracks/markers.

20 Mixing

20.1 FX Plugins

ReaClassical is shipped with various mastering-grade JSFX plugins to cover typical needs although obviously REAPER allows for any 3rd party plugins. For a list of rec-

ommended free plugins see Appendix C. In ReaClassical, you should add plugins to the dedicated mixer tracks.

20.2 Aux & Submix

Users have the ability to create aux and/or submix tracks that stay visible (and stay after the mixer tracks). To set up, simply create a single folder via Horizontal Workflow **F7** and/or Vertical Workflow **F8** then create as many aux/submix tracks after the mixer tracks as you like via the Add Aux **@** or Add Submix functions **#** . It is important to keep the @ or # at the beginning of the track but you can add any name you'd like e.g. '@hall-verb', '#strings'. To route, click-drag from a mixer track's routing stripes to the desired @ or # track. When using any of the ReaClassical functions such as auditioning, these tracks will remain visible.


For # submix tracks, simply add a hyphen (-) at the end of desired track names in the first folder and sync via **F7** or **F8**. Now those related mixer tracks will not route directly to RCMaster. As an example, say tracks 3-6 are all string section microphones and you'd like to sum them all to a string submix track called '#strings'. Just add a hyphen to the end of the names for tracks 3-6, sync and then create the routing to #strings via click-dragging from the routing stripes. This routing is maintained during **F7** or **F8** syncs.

20.3 Roomtone

In a live concert recording that contains audience noise in between movements and applause at the end of a complete piece, it is often desirable to give the impression of a clean recording with no audience present. Recorded or generated room tone then becomes very important as an alternative to audio fading to complete digital silence which destroys the illusion of listening back to a live concert. ReaClassical includes a dedicated room tone track for this purpose. This way, the auditioning tool will keep the track displayed in both track and mixer panels. Add via **~** (tilde). Once added, you

can add clean recorded noise captured before or after the concert or generate endless roomtone the length of your project from a very small portion of clean silence from the concert itself (hint: try using a white noise generator into a convolver such as ReaVerb that uses a few seconds of clean room tone as the impulse!). As of ReaClassical 24.12, the Create CD Markers function automatically generates precise volume automation at the track level to seamlessly fade in and out of room tone! See the mastering section for more details. Please note that there is a limit of one reference track per project.




20.4 Reference Track

Add a reference track via  to allow for importing a commercial album track or similar to help achieve the desired loudness levels, EQing etc for your own material. The reference track is deliberately placed outside of the RCMaster structure and can therefore be quickly auditioned independent of any effects you have on the mixer and RCMaster tracks. There is currently a limit of one reference track per project.

21 Mastering

Mastering in ReaClassical is game-changing. Many features described here are not available in any other classical DAW. I hope that the ‘ReaClassical’ way saves you much time and helps you look forward to the mastering phase of the project. While automatic DDP generation, automatic room tone function, and professional album reports are the main features here, you will probably find the revolutionary automation mode is an extremely efficient way to add static mixer scenes across your production as well enjoying the ability to quickly reorder album tracks via a simple keyboard shortcuts.

21.1 Mastering Mode


Change ‘mastering’ mode to ‘1’ in ReaClassical preferences  and sync via  or . In addition to making the mixer tracks, busses and RCMaster available in the

arrange window for setting static mixer scenes via envelope points, it also serves to declutter by hiding any source group audio. The hide and show child tracks shortcuts still work on the destination folder but in mastering mode also works on automation lanes. Simply select the relevant track connected to the lane and use the usual **E** and **D** keys to hide and show automation lanes. Look out for more ‘mastering’ mode features in the future.



21.2 Automation

Given ReaClassical is built on top of REAPER, it allows for same high-quality automation workflow with a ReaClassical twist. Beyond the following workflow descriptions, it is recommended to read the relevant REAPER manual section as there are far more features than can be described here. It makes most sense to leave any automation work until the destination group editing is largely complete. As described above, turn on ‘Mastering’ mode to ‘1’ via ReaClassical Preferences **F5**. Sync via **F7** or **F8** and the project arrange window will now show only the first group plus # and @ busses, RoomTone, Reference (if present) and RCMaster. To add static mixer and FX ‘scenes’ to automation lanes (very useful for quickly setting up different settings for the various pieces on an album), first enter ‘automation’ mode via **Ctrl**+**I**. All the envelope buttons will turn blue (‘latched preview’) and you will see a message box with instructions. Simply set any desired mixer controls or parameters in an open FX window on one or more tracks and press **I** to enter the values as points on the automation lanes at the edit cursor position or, if one exists, within the time selection. Continue to add, edit or audition and once completed, exit ‘automation’ mode via **Ctrl**+**I**. The envelope buttons will then turn green (‘read’ mode). Hopefully this ‘ReaClassical’ way can make things faster and easier at the same time. Once multiple static mixes have been set up, you can then, of course, use more detailed automation via the pencil tool or riding the fader to, for example, temporarily bring up spot microphones.

In addition, there are also take envelopes that you can access via right-clicking on an item and going to **Take >> Take Volume Envelope**. This is incredibly useful for transparently reducing very short stray peaks versus using a limiter. Simply create a selection over

the problematic area by left-click-dragging and then **Ctrl** +  and drag up or down to just affect that portion of the envelope without needing to add in individual points. It's such a time-saver! The benefit here is that you can also see how the item waveform is affected in realtime.

21.3 Repositioning Tracks in an Album

There are two functions which help with reordering or repositioning tracks. First, and perhaps most useful for producing a classical album, is if you decide that you need to reorder one or tracks. Simply select the track you want to move and press either **Ctrl** +  or **Ctrl** +  to switch with the track immediately to the left or right. Note that gaps are preserved too.

The other situation is when you want to start with uniform gaps between a series of short separate pieces. Use the **Ctrl** + **Y** shortcut and enter a value in seconds. Your pieces are then automatically spaced and items crossfaded are left intact.

21.4 Loudness

In terms of loudness, I personally aim for about -18 LUFS Integrated for my classical albums though it can be as high as -16 LUFS and as low as -20 LUFS. The new loudness JSFX meter in REAPER along with the normalization of loudness and true-peak limiting in the render dialog are priceless. It's another reason I couldn't go back to the big classical DAWs at this point.

21.5 Metadata

Track titles are added to the individual items on the first destination track by double-clicking on the item or selecting and pressing **F2**. Note that only items that start tracks should be named. The rest of the metadata is then added via the Create CD

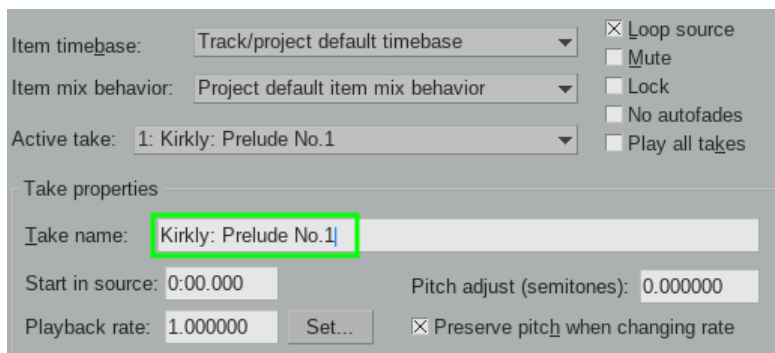


Figure 11: Adding Track names

Markers function **Y**. You can add UPC/EAN and ISRC numbers as desired followed by album title, performer, composer and genre. The Markers to CUE function **C** will take as much information as it can from the saved DDP metadata but the user is free to change as desired.

21.6 Creating DDP filesets

I have introduced a workflow to automatically add the CD/DDP markers, regions and room tone automation via **Y** (track and region names are pulled from item take names, markers/regions auto-snap to CD frames, initial 2-second pre-gap, silent roll out and album metadata also added!). It is 'smart' in the sense that if there's no take name, no marker or region will be created. In other words, press **F2** with an item selected to enter track names where markers/regions need to be created. It's perfect for classical releases where a crossfaded item is likely an internal source-destination edit versus a new track. For CD tracks that you want to have a visual CD player count-down, simply start the item name with an exclamation (!). Preferences such as CD marker offset, pregap length and album lead-out can be set via ReaClassical Project

Preferences **F5** . So it's now very quick to export a DDP set!

Further, you can add audio to the initial pregap (an 'easter egg' track) by not giving the first item (or crossfaded items) a take name. The function will assume that this is supposed to be hidden and generate the initial pregap length accordingly.

If a room tone track is present in the project, the function will also generate precise track-level volume automation that creates perfectly-matching fades at points where items fade into and out of silence on the first destination track. In other words, slicing and dicing room tone audio to fill in digital silence is no longer necessary in ReaClassical!

For more information read the description of the DDP function in appendix A.

21.7 Creating CUE Files

A CUE file can be generated via **C** (no need create a time selection). The high-resolution audio portion can be generated separately in the render dialog via the pre-set.

21.8 BIN+CUE set

Create a BIN/CUE pair (either select 'regions define tracks' and render the whole project or select 'use only # markers' and render by time selection if you don't want the first pregap as actual silence at the start of track 1).

21.9 Album Reports

When using the **C** shortcut, ReaClassical also generates both a plaintext and HTML album report in the project folder including details such as pre-gaps, track title, start time, track length, UPC/EAN and ISRC (if present), total running time etc. This is a

Generated by ReaClassical (17/12/2023 10:06pm)

Album: Fall Recital 2023

Album Performer: Kirkly

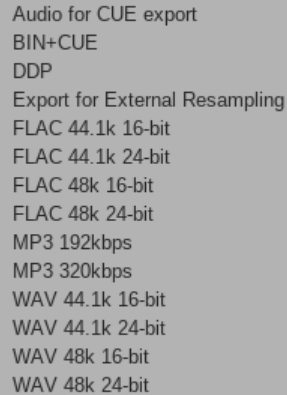
UPC/EAN: 1234567890123

Total Running Time: 34:06:15

| Track | Start | Length | Title | ISRC |
|-------|----------|----------|------------------------------|--------------|
| p | 00:00:00 | 00:02:00 | | |
| 01 | 00:02:00 | 04:04:24 | Kirkly: Prelude No.1 | GBR3C2300019 |
| 02 | 04:06:24 | 04:28:26 | Kirkly: Prelude No.2 | GBR3C2300020 |
| 03 | 08:34:50 | 07:03:09 | Kirkly: Prelude No.3 | GBR3C2300021 |
| 04 | 15:37:59 | 04:53:62 | Wollenberg: 'Midnight' Etude | GBR3C2300022 |
| 05 | 20:31:46 | 05:27:41 | Tarrasch: Little Fugue | GBR3C2300023 |
| 06 | 25:59:12 | 02:29:64 | Whittaker: 'Lyrical' Prelude | GBR3C2300024 |
| p | 28:29:01 | 00:03:00 | | |
| 07 | 28:32:01 | 05:34:14 | Whittaker: 'Lyrical' Fugue | GBR3C2300025 |

Figure 12: An example of an automatically generated HTML album report

fantastic and automatic way to send information to clients or a duplication/replication factory.





- Audio for CUE export
- BIN+CUE
- DDP
- Export for External Resampling
- FLAC 44.1k 16-bit
- FLAC 44.1k 24-bit
- FLAC 48k 16-bit
- FLAC 48k 24-bit
- MP3 192kbps
- MP3 320kbps
- WAV 44.1k 16-bit
- WAV 44.1k 24-bit
- WAV 48k 16-bit
- WAV 48k 24-bit


Figure 13: ReaClassical Render Presets

22 Rendering

22.1 Presets

ReaClassical includes various rendering presets to make rendering extremely quick and easy. In the Render dialog , click on the presets button then 'All Settings'. The preset names are self-explanatory. The first four entries are for exporting a whole album as a single audio file. The remaining use the automatically created regions after using the Create CD Markers function  to create automatically named folders of audio files, one per CD track. After selecting a preset, you should feel free to change any render settings and perhaps save as a new preset for future use. By default, the presets use the built-in REAPER standard triangular dither.

22.2 Samplerate

Now that r8brain free has been introduced as the best quality resampler available in REAPER (I highly recommend double-checking that it is selected when resampling at render time) I feel I can do everything, including DDP creation, without leaving my favourite DAW. However, the Marker to CUE function  is still useful for all sorts of things and I often create FLAC + CUE for album playback in my media player or WAV + CUE to easily burn a CD at home.

22.3 Dither

Use either the built-in REAPER dither options or RCDither as the last plugin on the master chain. If using RCDither or any other 3rd-party dither be sure to keep the master fader at unity and disable all REAPER dither checkboxes.

22.4 Loudness & Limiting

REAPER has a fantastic rendering feature which allows the user to set a desired loudness and peak / true peak setting. For quick exports that need to meet certain targets (i.e. streaming) this makes things extremely efficient and is very transparent when not set to extreme values.

22.5 Dry-run Rendering

Another REAPER feature that is outstanding is the dry-run render function which allows for very quick offline loudness and peak checks and much faster than using REAPER's included realtime loudness meter. It is therefore extremely easy to set up compressors, limiters etc in the project and make small adjustments based on the dry-run values and maintain complete control over the process.


22.6 Other Rendering Tips

Not necessarily obvious to new REAPER users are the special =START and =END markers (make your markers in the usual way and label them accordingly) that constrain the length of the project. Rather than rely on extended silence at the end of items or time selections, the =END marker is a great way to ensure you have the exact amount of lead-out you want at the end of the disc. Positioning both special markers is great way to generate files for multi-disc releases without having to rely on multiple projects.


You will hopefully notice I have included various shortcuts for manually creating regions (single or multiple) from items and time selection (great for quickly generating demo snippets). Also worth noting is that you can still do some (or all!) of your source-destination editing with your track markers in place as the S/D markers have IDs far higher than any classical CD would have and are automatically deleted after a successful edit. As long as you have your ripple-per-track mode engaged, all your existing marker placements and carefully crafted edits will remain intact. But, again, don't manually create CD markers at this point as I include a very powerful tool to make light work of that side of mastering.

23 Project Management

23.1 Typing Notes

Document your takes either using the built-in REAPER project notes or SWS Notes  (for 'Notes') which can be attached to items, tracks, markers etc. I personally prefer item notes on the main microphone pair. It's a very useful tool to have docked at the bottom of the screen.


23.2 Folder Structure

ReaClassical defaults to placing media and exports into appropriately subfolders making project file navigation easier. Also, ReaClassical defaults to separate folders for automatic backups and autosaves. These settings are subject to change and can be modified by going to the REAPER preferences  (for ‘Options’).



23.3 Automatic Backups


REAPER allows for powerful and complex backup routines. As referenced above, ReaClassical defaults to 10 time-stamped backups and 10 auto-saves every 15 minutes when not recording. Feel free to modify for your own way of working including switching to backups and autosaves for a number of unique days.

23.4 Cleaning

If in doubt, keep everything! Otherwise, the  Clean current project directory is an excellent way to reduce the size of your projects. Note that when assigning a session name via the Take Counter Window, currently the above REAPER menu item doesn’t search recursively. In a way, this reduces the chances of accidentally deleting precious takes. You can always manually delete but, from experience, it is *much* better to simply keep everything.

23.5 Archiving

There are various ways to archive classical music projects. First, you can access the Project Bay by   shortcut. You can then ensure that all media used in the project is contained within the project folder itself. If not, you can select as many as necessary, right click and move/copy into the project folder. After this, you can simply compress the folder as a zip and store on an external drive. A further step to

guaranteeing ability to open in the future is to freeze tracks so that plugin effects are baked in (with ability to unfreeze later if possible). Alternatively you can save a copy of the project via , converting to a format like FLAC and trimming the media as you wish. Finally, one to look out for in the future is Project Archiver. However, I don't believe it is quite ready for primetime yet and recommend using one of the other methods for now.

Part IV

End Matter

24 Thanks

I am appreciative of the collective contributions of the REAPER community with regards the early source-destination actions (Pelleke, in particular), MPL, X-Raym, BirdBird, RCJacH, Sai'ke, Meo-Ada Mespotine, cfillion and many more. Finally, many thanks to Justin and Schwa for such an amazingly versatile DAW.

25 Closing Thoughts

I hope you enjoy the ability to do serious classical editing with ReaClassical on REAPER and that my efforts go some way to making things better, easier and more efficient. Remember that if you find any oddities with the functions or have a bright idea for something new and shiny, please add your thoughts to the dedicated thread on the forums and/or create an issue or start a discussion on my Github repository located at <https://github.com/chmaha/ReaClassical>.

Part V

Appendices

A Description of ReaClassical Functions

Preliminary Note: These proceed in a quasi-workflow order. I include the default shortcut keys if using my portable install or resource folder base. You can also use the custom toolbar via the mouse.

Create/Sync Horizontal Workflow F7

Description: A quick way to create a folder group with as many tracks as you need. It can also be used on a single existing folder group to re-sync track names and re-build project routing.

Notes: Use on a completely empty project. I would use this if you are planning to use a horizontal approach to source-destination editing (i.e. the various takes are laid out from left to right) or if you want a quick way to set up a mixing/mastering track set with a single take. The function automatically sets up the tracks for group media and razor-editing along with dedicated mixer tracks.

Create/Sync Vertical Workflow F8

Description: A multi-use function to 1) set up destination and source groups with as many tracks as you need, 2) to create source groups from an existing destination folder group (for example, created with F7 shortcut) and, for in the middle of editing, 3) to (re)create project routing and sync track-naming, record inputs and lock states. Note that for 3), all folders should contain the same number of tracks.

Notes: For all track settings (volume, pan, polarity, sends and FX) you should use the dedicated mixer tracks.

Explode multi-channel item F10

Description: Explode multi-channel item(s) to either all mono or stereo-interleaved + mono

Notes: First create a folder [F7] or multiple folders [F8] and import the multi-channel item(s) onto the same folder track (important!). Select one or more items of the same channel count. Run the function and then choose ‘yes’ to convert the first two iso tracks to stereo or ‘no’ to leave as mono. Depending on the choice, the number of tracks in the folder will be increased or decreased with the all-mono option leaving the folder track itself empty ready to run prepare takes [T] to create a muted guide track.

Add Room tone track [~]

Description: Add a burnt sienna-colored aux/submix track labelled ‘RoomTone’ to the end of the tracklist that is visible in both the track and mixer panels.

Notes: The track will be included in the signal path via the regular audition function [A]. If present when creating CD/DDP via the function will also generate volume automation to create perfect crossfades with the items on the first destination track. Slicing and dicing room tone audio to fill in digital silence is now a thing of the past. Simply add a long recorded or convolution-generated room tone audio item before running the function. The ReaClassical way of dealing with room tone is non-destructive and instant!

Add Aux send track [@]

Description: Add a rosewood-colored aux track prefixed with an ampersand (@) to the end of the tracklist but is only visible in the mixer.

Notes: This allows the user to keep assigned aux tracks visible in the intelligent mixer. Create any connections to the aux in the destination group (including child tracks) and then push to the source groups via the Vertical Workflow function [F8]. This routing is maintained during subsequent [F7] or [F8] syncs.

Add Submix track [#]

Description: Add a teal-colored aux track prefixed with an hash (#) to the end of the tracklist but is only visible in the mixer.

Notes: This allows the user to keep assigned submix tracks visible in the intelligent mixer. Create any connections to the submix in the destination group (including child tracks) and then push to the source groups via the Vertical Workflow function **[F8]**. For correct routing to a submix (versus a send), simply add a hyphen (-) at the end of desired track names in the first folder and sync via **[F7]** or **[F8]**. Now those related mixer tracks will not route directly to RCMaster. As an example, say tracks 3-6 are all string section microphones and you'd like to first sum them all to a string submix track called '#strings'. Just add a hyphen to the end of the names for tracks 3-6, sync and then create the routing to #strings via click-dragging from the routing stripes. This routing is maintained during subsequent **[F7]** or **[F8]** syncs.

Add Reference track **[']**

Description: Add a reference track labelled 'REF' to the end of the tracklist that is visible in both the track and mixer panels.

Notes: The track will be placed outside of RCMaster signal path and easily auditioned via **[A]**.

Hide and Show child tracks / automation lanes **[E]** and **[D]**

Description: Hide child tracks to save screen estate and for working with multi-channel takes as if working with just stereo. In 'mastering' mode, the shortcuts also work for hiding and showing automation lanes.

Notes: Select a folder track and press **[E]** to hide the children or **[D]** to show them. All S-D and razor editing functions work perfectly while folder groups are collapsed. This recreates a popular way of working with classical music takes in Pyramix. In 'mastering' mode, select a track containing automation lanes and press **[E]** to hide the automation lanes or **[D]** to show them.

Take Counter Window **[Ctrl] + [Enter]**

Description: Track take numbers and session name during recording sessions.

Notes: It is advised to save your project and name your tracks before starting to record. This ensures that the recorded files have usefully unique names. You can right-click

on the window to override automatic take numbering (0 = off (recommended), 1 = override), set a take number to increment from and optionally set a session name to act as media subfolder. You can left-click to recalculate the track count if you have removed some unused files from the project path. The calculated upcoming take number factors in unused files in the project path so as to avoid any file-naming conflicts. You should find this to be an extremely robust take system that rivals Pyramix, Sequoia etc.




Record-Arm Folder +

Description: Record-Arm a folder and child tracks

Notes: This is designed for horizontal workflows. Simply select the folder parent and press the shortcut to record-arm all tracks in the folder.

Classical Take Record

Description: A one-button shortcut for stopping and starting recording of takes.

Notes: To use, select a folder track, position the edit cursor if necessary and press . If the parent isn't already record-armed (probably the case before you start your first recording of the session), the function will first simply record-arm the group so you can usefully monitor incoming signal. On a subsequent press of  recording begins. Press again to stop the recording. To immediately start a new take, simply press  again. Note that in a vertical workflow, the next folder has already been selected, record-armed and that the cursor returns to the original position for easy lining up of takes. If you run out of source groups, the function will automatically create a new one.

Add Track To All Groups +

Description: Add a new microphone to all folders (or a single folder) mid-recording session.

Notes: The function will prompt for a track name and then a new track will appear at the end of every folder and mixer track set. You could follow up by moving the track using the function below.

Move Track Up/Down In All Groups + + / + +

Description: Moves the selected child track up and down within the group.


Notes: Available for both horizontal and vertical workflows, the function only works on child tracks presently. Note that the mixer track order automatically updates too.

Delete Track From All Groups + +

Description: Delete the selected child track from all groups in the project.

Notes: Available for both horizontal and vertical workflows, simply select a single child track and press the shortcut. Note that the mixer tracks automatically update too.


Prepare Takes

Description: Intelligently prepares recorded or imported takes for source-destination editing. Coloring scheme is set in ReaClassical Preferences .

Notes: With a single folder group (or individual tracks), the shortcut will auto-color and group takes from left to right. With a vertical workflow consisting of a destination group and multiple source groups, the function will auto-color top to bottom and group folder items left to right. Essentially in either setup, takes are given different colors and all items associated with a take grouped for editing. If you don't like the colors, run the function again until you are happy! The function also allows for takes that don't start or end exactly at the same time (this can happen if you receive pre-edited materials). The end result is if you drag one item of a take group, every other item will move in sync. NOTE: The function was designed for use after initial recording or importing of media but as of 24.5.3 should work at any point during editing (for example to import a patch recording). In this case, the destination group items will switch to using alternating colors so that you can easily see where your edits are on the timeline. And, as of 24.8.5, the function uses the 'Prepare Takes: Random colors' value from ReaClassical Preferences to use either the new color scheme (default, set to 0) or the old random color method (set to 1). A reminder that the new REAPER native grouping (when set up via Horizontal or Vertical Workflow functions) works for 99% of situations without Prepare Takes but for takes that don't start or end at quite the same point it is a must.

Duplicate Folder (no items)

Description: Create a duplicate without media items of the highlighted folder.

Notes: Note that in a vertical workflow, Classical Take Record  automatically creates new folders if needed, this function does not need to be used when recording material. However, if importing pre-recorded takes and you need more source groups to accommodate the material, this is still very useful.








Colorize

Description: Add a identifying custom color to an item and those in the same group.

Notes: Useful if you need to re-record a section of music after editing has started.

Audition & Exclusive Audition / +

Description: Mouse-driven auditioning of folders or individual tracks.

Notes: Simply hover the mouse over an area of the project and press  or  +  to begin auditioning the audio. With , hover over a folder track to hear the complete mix or a single track within a folder for listening to individual instrument or sections. Note that the  function honors any aux or submix track routing. The main function respects soloed or muted @ aux, # submix and roomtone tracks so you can easily and quickly set up a custom audition mix including a full mix, just the string submix, a single reverb bus and anything else you can imagine! With  + , hover over any track including the parent track to *only* hear that track (routed through any optional submix tracks to RCMaster).

Whole Project View Horizontal

Description: Zoom to show the whole project horizontally.

Notes: Very useful for a birdseye view of your project so you can navigate to another section. If there are multiple folders, the function collapses them. If fewer than two folders, the function respects the current folder view.


Whole Project View Vertical +

Description: Zoom to show the whole project vertically.

Notes: Very useful for a birdseye view of your project so you can see all vertical take folders. The function respects current child track visibility to allow for a typical editing situation of viewing all of the destination group but only the folder tracks of source groups.

ReaClassical Project Preferences

Description: Set S-D crossfade length, CD track offset and INDEX0 pre-gap length (CD player countdown into next track), album lead-out time, Prepare Takes colors, Mastering Mode, S-D Destination Marker Check Range (ms)

Notes: These values are saved on a per-project basis. While the INDEX0 pre-gap length can be set lower than 1 second in the dialog box, the *Create CD Markers*  function will ignore and use a value of 1 second as this is the lowest that makes any sense for displaying the countdown to the next track. Prepare Takes by default uses the new color scheme for items ('Prepare Takes: Random colors' set to 0) which is two shades of blue for horizontal workflows and blues and greens for vertical workflows thereby aligning closely with the colors of the S-D markers. The old coloring method ('Prepare Takes: Random colors' set to 1) uses random colors per item group. This can help see where edits have come from but because of the randomness may require several iterations until you avoid clashes or eye-sores! Mastering mode should be set to either 0 (disabled) or 1 (enabled). The user can change the checking range (distance beyond an item edge/fade or crossfade) when placing destination IN and OUT markers. Setting to 0 would just check if the marker would be placed *inside* a item fade or crossfade.

Find Takes (based on filename)

Description: Enter a take number based on the numerical suffixes at the end of filenames and optional session name to quickly jump to that media item.

Notes: If the function can't find a media item with that take number and optional session name, it will let you know and offer to try again with a different number or session name. This will work for any filenames system that uses numbers before the file extension such as 'mvt1_main_pair-T04.wav' or 'beethoven_cello-take_23.flac'. Note that if the imported or recorded files have zero-padding that is not a problem as the function strips these away. The session name search can be used to find any text

in the filename and allows for partial searches. If you have used an item to create an S-D edit, searching for a take will ignore these items and move directly to the original sources.

Source-Destination Markers 1, 2, 3, 4

Description: Add source-destination markers ready for making the edit.

Notes: 1, 2 = destination IN/OUT; 3, 4 = Source IN/OUT. Inbetween the destination markers is where the edit will actually happen. Inbetween the source markers is where the material is taken from. Use all four markers for 4-point editing. Use any combination of 3 markers for 3-point editing. Use either 1 source and 1 destination (more useful) or just the source markers for 2-point editing (less useful). Very important and useful to note is that the source marker labels reflect which source group was highlighted when the markers were placed. In other words, to create source markers, first select the item in the chosen folder track and then use the 3 & 4 shortcuts. This means that when the actual edit is made (using 5) it doesn't matter what is highlighted at the time. Obviously this is only useful if using a vertical take system approach.

If you attempt to set one of the destination markers inside of an existing crossfade or within 500ms of a xfade or item edge, the function will alert you (pressing OK places the marker anyway). This helps avoid awkward 'sliver' edits that can happen especially if you are zoomed out and placing markers by ear. You can set the check range via F5. The check range (in milliseconds) is the distance beyond an item edge, fade or crossfade. For example, setting to 0 would only check for placement *inside* a fade or crossfade.

S-D Edit 5

Description: Make the source-destination edit (2-, 3- and 4-point editing)

Notes: Once you have placed your S-D markers press 5 to make the edit. Whatever the number of markers you used, the edit will be crossfaded using a short equal power fade (you can change this in REAPER options under *Media Item Defaults*) and when using 4 markers, the S-D markers removed ready for the next edit. The edits are

perfectly crossfaded and the user only needs to focus on the selection of source material. For any S-D edit you can, of course, undo the action and return to the previous state. The desired crossfade length is set via ReaClassical Project Preferences **F5** . Note that this function can be used in multi-tab S-D editing mode (see below).

3-point ‘Assembly Line’ Edit **F3**

Description: Uses both source markers and destination-IN marker to compile edits from start to finish.

Notes: The destination-IN marker is retained and placed at the end of the edit so that for subsequent operations the user only has to set the source markers. Worth repeating from the S-D edit notes:

*... the source marker labels reflect which source group was highlighted when the markers were placed. In other words, to create source markers, first select the item in the chosen folder track and then use the **3** & **4** shortcuts. This means that when the actual edit is made (using **5**) it doesn't matter what is highlighted at the time.*

Note that this function can also be used in multi-tab S-D editing mode (see below).

Insert with Timestretching **F4**

Description: Makes the source material fit the the space in between the destination markers using time-stretching vs rippling later material.

Notes: Requires placing all four S-D markers. This is less useful for classical music editing but perhaps very useful for video work where replacement material has to fit exactly into the time used by the original. Crossfade length is set via ReaClassical Project Preferences **F5** . Note that this function can also be used in multi-tab S-D editing mode (see below).

Delete with Ripple

Description: Deletes material between the source markers, rippling all later material.

Notes: This only affects the folder group that was highlighted when the source markers were placed which will almost always be the destination group (the top folder in the project). Crossfade length is set via ReaClassical Project Preferences **F5**.

Delete Leaving Silence **Ctrl** + **←**

Description: Deletes material between the source markers, no rippling of later material.

Notes: This is similar to *Delete with Ripple* but instead leaves a gap where the original source material existed.

Add Source Project Marker **Ctrl** + **Alt** + **3** or **Ctrl** + **Alt** + **4**

Description: Enables multi-tab editing

Notes: To work in multi-tab S-D edit mode, the user is required to use the S-D project markers as a pair, one in the ‘destination’ tab and the other in the ‘source’ tab. In multi-tab S-D edit mode, any source makers placed by the user are not deleted in order to aid a quick undo in the destination tab ready to reapply a tweaked edit.

Add Destination Project Marker **Ctrl** + **Alt** + **1** or **Ctrl** + **Alt** + **2**

Description: Enables multi-tab editing

Notes: To work in multi-tab S-D edit mode, the user is required to use the S-D project markers as a pair, one in the ‘destination’ tab and the other in the ‘source’ tab. In multi-tab S-D edit mode, any source makers placed by the user are not deleted in order to aid a quick undo in the destination tab ready to reapply a tweaked edit.

Delete all S-D Markers **Ctrl** + **Del.**

Description: Deletes source and destination markers.

Notes: Useful if you want to abandon a S-D edit, however, there’s also no problem leaving the markers for another time given that shortcuts **1**, **2**, **3** and **4** replace any existing version of the marker. Also when running *Create CD Markers* function all markers are deleted in any case.

Delete all S-D Project Markers **↑** + **Del.**

Description: Deletes both source and destination project markers

Notes: In order to switch back to regular single-tab S-D editing, it is important to run this command otherwise the S-D edit functions will continue to attempt to find markers elsewhere.

Classical Crossfade Editor F

Description: Opens a custom two-line crossfade editor view for precise finessing of S-D edits.

Notes: To enter the crossfade view, select the lefthand item of a crossfaded item pair. The user is then presented with a zoomed-in view of the edit. Red is always the left item, green the right. For safety reasons, all items from the left red item to the beginning of the project are locked to avoid inadvertently messing with an existing fade. To immediately audition, use the A shortcut in one of four areas. Hover the mouse in either of the blank areas (no media item) in the top left or bottom right of the view to audition the function from that location to the mirrored location on the other side of the edit. Note how easy it is to quickly set an audition length! Or, hover the mouse on the first item and press A to just audition the material into the fade. Hover and press A on the outgoing item to only hear the material out of the fade. Note that auditioning in the arrange window or in fade editor mode maintains muted items on the folder track (for example, in the case of a muted guide track created by Prepare Takes T for mono-channel polywav import).

NEW: To actually finesse the edit, ensure at least one of the crossfaded items is selected. Then hover your mouse in a blank area (similar to the above fade editor audition tool process) and press Z. You'll notice that the waves mirror extend to the mouse position to allow for easy lining up of the material. Place the edit cursor at an appropriate edit point on the left red item (i.e. just before a transient) then simply move the right green item to align and then press X. Audition again, Z to expand again. You can quickly move to the previous or next item (with all coloring and locking automatically happening behind the scenes) by pressing Q or W. Or, simply press F to exit the fade view (it goes without saying that the original colors of the project items are restored).

Note also that while in crossfade editor view any edits usefully only affect the destination group.

Edit Classical Crossfade ⌘Z

Description: Expand the crossfade for editing while in the crossfade editor view.

Notes: This shortcut will only work while in crossfade editor view. If you attempt to use it in other situations, you will receive a helpful message. As described above, when either one or both items are highlighted, hover your mouse in a blank area and press ⌘Z. You'll notice that the waveforms are mirror extended to allow for easy lining up of the material. Simply put the edit cursor just before a transient on the red item, move the green right item to align, and then press ⌘X.

Classical Crossfade ⌘X

Description: Create a 'classical' crossfade either in regular project view or crossfade editor mode.

Notes: While in the project view, drag an item (or grouped items) over another, move the edit cursor where you want the edit to happen and press ⌘X. Given the availability of S-D edit functionality and group razor-editing, this function is less useful in this context. However, it is essential in the crossfade editor mode for making the edit. Crossfade length is set via ReaClassical Project Preferences F5.

Automation Mode ⌘+I

Description: Coupled with 'mastering' mode, allows for adding mixer and FX parameter values as envelope points

Notes: Enter 'automation' mode via ⌘+I. All the envelope buttons will turn blue ('latched preview') and you will see a message box with instructions. You can then use the function below. Exit 'automation' mode again via ⌘+I. The envelope buttons will then turn green ('read' mode).

Insert Automation I

Description: Insert mixer and FX values as envelope points into automation lanes

Notes: Simply set any desired mixer controls or parameters in an open FX window) on one or more tracks and press **I** to enter the values as points on the automation lanes at the edit cursor position or, if one exists, within the time selection.

Reposition CD Tracks **Ctrl** + **Y**

Description: Create uniform custom spacing between CD tracks.

Notes: Using the same system as *Create CD Markers* below, this function works intelligently based on whether items have a take name. If the take name is present, the desired silent gap is created. If not, the crossfade (or gap) is respected by shifting the item by the same amount as the previous one.

Shift CD track one track to the left/right **Ctrl** + **←** and **Ctrl** + **→**

Description: Shift CD tracks left and right along the timeline.

Notes: Select the start of a CD track and use the shortcuts to rearrange the order of your album. The function treats crossfaded CD track starts as part of the same group to cover instances where a movement follows on *attacca* to maintain the correct order. Then simply run or re-run the *Create CD Markers* function to create new markers that align with item starts.

Create CD Markers **Y**

Description: Auto-generation of CD/DDP markers, UPC/ISRC codes, and room tone automation, for efficient DDP, bin/cue and individual file exporting. Checks against Redbook standards and returns warning messages if there are 1) more than 99 tracks, or 2) There are tracks shorter than 4 seconds, or 3) the total length of the project is greater than 79.57 minutes.

Notes: This might be the biggest time-saving function in the ReaClassical system. It works as follows: 1) Edit gaps between items until you are happy 2) Add take names only to items that will become CD track starts 3) Run the function via shortcut **Y** and you will be asked to enter various information including UPC/ISRC (optional) and CD metadata. Done! Note that ISRC codes are auto-generated per track based on the numbers you enter.

You can add audio to the initial pregap (easter egg track) by not giving the first item (or crossfaded items) a take name. The function will assume that this is supposed to be hidden and generate the initial pregap length accordingly. All album metadata is placed towards the end of the album inside a default 7-second silent lead-out (so that CD players in cars don't immediately cycle back to the first track without a little breathing room). This value can be changed via the ReaClassical Project Preferences **F5**. In addition to markers, regions are also generated for easy exporting of individual tracks. If you need a countdown into a track, simply add a ! at the start of the take name (e.g. '!Allegro'). Then after running the function adjust the position as desired (it defaults to 3 seconds in length but this can easily be set in ReaClassical Preferences). It is worth repeating at this point that you should only give names to items that are track starts. If you skip an item, the function rightly assumes it is part of the previous track. Note that the markers snap to exact CD frames and if the media item start is in between CD frames, the function will always place the marker on the earlier of the two. By default, the function uses a 200ms offset for placement of the markers (as in, markers appear 200ms to the left of the media item start) but, again, this value can be set via ReaClassical Preferences.

If a room tone track exists in the project, the function will also generate volume automation to create perfect crossfades with the items on the first destination track. Slicing and dicing room tone audio to fill in digital silence is now a thing of the past. Simply add a long recorded or convolution-generated room tone audio item before running the function. The ReaClassical way of dealing with room tone is non-destructive and instant!

I feel that once you try this CD/DDP marker generation workflow, it is difficult to ever go back to other ways of working. The key thing to think about is that the markers and room tone fade-ins and outs are trivially easy to recreate if you change a gap between items or even rearrange the order of tracks. Just run the function again. The key is the workflow: all marker generation is automatically based on item positioning and naming. Plus, all metadata and ISRC is saved into the project file so once entered you don't have to ever type it in again unless you need to make changes. Room tone volume changes are made via auto-generated volume envelope points that precisely map REAPER's built-in fade curves.

Hopefully you agree that this way of working with CD/DDP layout is a game-changer, a real time-saver and simply a better way of thinking about this portion of the mastering process.

Markers to CUE

Description: Once you have used the *Create CD Markers* function, it is now extremely easy to generate a CUE file and album reports using partly auto-generated metadata.

Notes: The genre defaults to classical, the year listed is the current year and the filename is based on the project name. Simply fill in the remaining details and press OK. Depending on the extension you choose, the CUE file will add the correct format to the accordingly. The CUE file (matching the given filename) is generated in the root of the project path along with an album report suitable for including when sending off to a CD factory or client. Any data entered is stored and recalled the next time you use the function. Before or after using the function, generate a whole project render in WAV, MP3, AIFF or FLAC using the included render preset. Then drag the CUE file into the same folder.




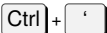

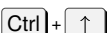
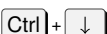





Lock Toggle (deprecated)

Description: Lock every source group (leaving the destination group free for editing in ripple-all mode)



Notes: This function is now deprecated but I will leave in place for now. It was useful before the new *Create CD Markers* function came into being as a way to engage ripple-all mode without disturbing source group items, thereby allowing moving of destination material along with CD markers in the final stages of the mastering process. There is no doubt that I much prefer working with the newer function. The lock toggle icon on the custom toolbar has now been replaced by a mug to represent the *Create CD Markers* action.

B Shortcuts

Navigation

| | |
|---|---|
|  | Project Start |
|  | Project End |
|  | Whole Project View (Horizontal) |
|  | Whole Project View (Vertical) |
|  | Find Takes (based on number found at the end of a filename and optional session name) |
|  | Increase peaks display zoom for project |
|  | Decrease peaks display zoom for project |
|  | Previous Item edge / previous crossfade (when in crossfade editor view) |
|  | Next Item edge / next crossfade (when in crossfade editor view) |
|  | Previous Marker |
|  | Next Marker |
|  | Move to item peak value (SWS) |

Folder & Source Group Preparation














| | |
|---|--|
|  | Create/Sync Horizontal Workflow (prompts for number of tracks) / Re-build routing etc |
|  | Create/Sync Vertical Workflow (from scratch or from single existing folder) / Re-build routing etc |

| | |
|--------------------------------------|---|
| F10 | Explode multi-channel items (polywavs) |
| \ | Duplicate Folder (no items) |
| ↑ + T | Add Track To All Groups |
| Ctrl + ↑ + Del. | Delete Track From All Groups |
| Ctrl + Alt + ↑ | Move Track Up In All Groups |
| Ctrl + Alt + ↓ | Move Track Down In All Groups |
| ~ | Add a room tone track |
| @ | Add Aux track |
| # | Add Submix track |
| ' | Add Reference track (outside of RCMaster structure) |





Recording & Take Management

| | |
|----------------------------|---|
| F9 | Classical Take Record |
| ↑ + R | Record-Arm Folder |
| Ctrl + Enter | Open Take Counter |
| Alt + C | Open Big Clock |
| T | Prepare Takes |
| K | Colorize (add custom color to item group) |

Editing

| | |
|---|--|
|  | Audition (full mix or child track) at mouse position (includes any unmuted @ aux or # submix connections) |
|  +  | Exclusive Audition (parent track or child track) at mouse position (only routing to RCMaster via any # submix connections) |
|  | Display child tracks (plus display automation lanes in ‘mastering’ mode) |
|  | Enconce (hide) child tracks (plus hide automation lanes in ‘mastering’ mode) |
|  | Split item |
|  | Join (glue) item |
|  | Group items |
|  | Ungroup items |
|  | Open ReaClassical Fade Editor |
|  | Create a classical crossfade |
|  | Extent crossfaded items for editing (when in ReaClassical Fade Editor view) |
|  | Toggle per-track ripple editing |

S-D Editing

| | |
|---|----------------------------|
|  | Add Destination IN marker |
|  | Add Destination OUT marker |
|  | Add Source IN marker |
|  | Add Source OUT marker |




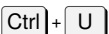
| | |
|--|--|
| | Make S/D Edit (2-, 3-, or 4-point cut) |
| | 3-point 'Assembly Line' edit |
| | Insert with time-stretching (All 4 S-D markers) |
| | Delete with ripple (between 2 source markers) |
| | Delete Leaving Silence (between 2 source markers) |
| | Add Destination Project Marker (multi-tab S-D editing) |
| | Add Source Project Marker (multi-tab S-D editing) |
| | Add Source Markers to edges or selected item(s). |
| | Move to Destination IN marker |
| | Move to Destination OUT marker |
| | Move to Source IN marker |
| | Move to Source OUT marker |
| | Zoom to Destination IN marker |
| | Zoom to Destination OUT marker |
| | Zoom to Source IN marker |
| | Zoom to Source OUT marker |
| | Delete all S-D Markers |
| | Delete all S-D Project Markers |

Mastering

| | |
|------------------------|---|
| Ctrl + I | Enter Automation Mode |
| I | Insert Automation (mixer controls and FX parameters to envelope points) |
| Y | Automatically generate a DDP set from items |
| Ctrl + Y | Reposition CD tracks |
| Ctrl + ← | Shift CD track one track to the left |
| Ctrl + → | Shift CD track one track to the right |
| M | Add Marker |
| N | Open/Close SWS Notes |
| L | Marker List (SWS) |
| ; | Regions from items (SWS) |
| : | Region from selection |
| / | Selection to item(s) |
| C | Generate CUE file and album reports from project CD markers |
| R | Render |

Miscellaneous

| | |
|-----------|--|
| F5 | ReaClassical Preferences (set crossfade length, CD track offset, INDEX0 pre-gap length, Album lead-out time) |
| F6 | Open/Close ReaClassical custom toolbar |
| H | Open ReaClassical help system (currently the PDF manual) |

-  Options (Preferences)
-  Project Settings
-  Batch file converter
-  Check for REAPER updates (using REAPER update utility lua)

C Recommended Free Mastering-Grade Plugins

First stop: *Reaplugs*, with particular mention of *ReaLimit* which I consider one of the best free transparent limiter available. You could easily mix and master a whole album using only these fine plugins. Others include:

EQ:

- **RCChannelEQ** (ReaClassical Channel EQ, included in the ReaClassical portable install and available in ReaPack via my repository). Uses DSP from airwindows ‘Baxandall’ and Stillwell’s RBJ Highpass/Lowpass Filters for broad-strokes EQing.
- **RCMasteringEQ** (ReaClassical Mastering EQ, included in the ReaClassical portable install and available in ReaPack via my repository). Uses DSP from airwindows ‘Hull2’ with added ‘Range’ dropdown (‘Classical’ or ‘Full’) for transparent, musical, broad-strokes EQing.
- **ReEQ** <https://forum.cockos.com/showthread.php?t=213501>. An amazing Fabfilter Pro-Q clone for detailed EQ work. Also comes with ReSpectrum which is an excellent analyzer. Both are included with the ReaClassical install.

Compression:

- **RCCompressor** (ReaClassical compressor, included in the ReaClassical portable install and available in my repository). Uses DSP from Express Bus Compressor by Stillwell. Default settings and ranges tuned to classical music with auto release. Use as an insert.
- **RCParallelK** (ReaClassical parallel ‘Katz’ compressor, included in the ReaClassical portable install and available in my repository). Also uses DSP from Express Bus Compressor by Stillwell to recreate the Bob Katz ‘transparent’ parallel compression settings. There’s only a make-up gain slider as everything else is baked in (-50dB threshold, 2.5:1 ratio, 1ms attack, peak detection mode). Use on

a dedicated compressor bus and adjust the gain slider to taste (with the compressor signal somewhere between -15dB and -5dB lower than dry signal according to Katz).

Limiter:

- **RCLimiter** (ReaClassical limiter, included in the ReaClassical portable install and available in my repository). Uses DSP from Smooth Limiter by Geraint Luff to which I added 4x oversampling code. Defaults are tuned to classical music with true-peak and lookahead functionality. Adjust the release to taste.

Reverb:

- **Convolution:** Convology XT (also runs perfectly at time of writing via yabridge on Linux) coupled with the Smplicity Bricasti M7 impulses. There are other free convolution plugins to use but, whatever the plugin choice, the Bricasti impulses in true stereo are fantastic and sound almost identical to the presets of the well-regarded Liquidsonics Seventh Heaven Professional.
- **Algorithmic:** For free and open source options try my RCVerb or Enover which uses zita-rev1 DSP. For paid options, ValhallaDSP Room and Vintage Verb, Fabfilter Pro-R, Voxengo Sobor, Acon Digital Verberate 2 and Sonible smart:reverb are all excellent non-iLok options for classical music and work seamlessly via yabridge on Linux. Note that the Liquidsonics offerings no longer require a physical iLok so can also be used on Linux via yabridge and iLok Cloud activation if you are feeling brave.

Final mastering magic:

- **‘Sonnox Inflator’-style waveshaping:** Try **RCInflator Ultimate** (a clone of the Sonnox product) or **MagicFairyDust** on the final stereo bus. Both effects are included in the ReaClassical portable install.



Figure 14: RCInflator

- Or, for an easy complete console vibe, use the **RCConsoleChannel**, **RCConsoleBus**, and **RCConsoleFinalizer** at the end of regular tracks, busses and final 2-bus respectively. Note that RCConsoleChannel does not have any controls.

Restoration:

- **Bertom Denoiser Classic** <https://www.bertomaudio.com/>. **Denoiser Pro** (\$25) allows for individual per-band thresholds and includes an adaptive mode.
- **RCDeEss Standard** (ReaClassical de-esser, included in the ReaClassical portable install and available in my repository). Uses DSP from airwindows DeEss.
- **RCDeEss Advanced** (ReaClassical advanced de-esser, included in the ReaClassical portable install and available in my repository). Uses DSP from airwindows DeBess.

Utilities:

- **RCGain** (ReaClassical gain plugin, included in the ReaClassical portable install and available in my repository). Uses DSP from airwindows PurestGain. Useful before or after plugins in lieu of a native channel trim knob.

- **JS Loudness Meter Peak/RMS/LUFS** (Cockos) (included with REAPER).
- **RCTime&PhaseTool** (ReaClassical timing and phase tool, included in the ReaClassical portable install and available in my repository). Add to a spot microphone channel. Achieves something similar to Merging's PanNoir to correctly align spot microphone channels with the main pair based on a fundamental Euclidean geometric relation to create a more impactful stereo image.
- **RCDither** (ReaClassical dither plugin, included in the ReaClassical portable install and available in my repository). Uses DSP from airwindows Not-Just-Another-Dither (Monitoring version) here called *Avant-garde*. This just might be the world's finest dither. There's a dropdown to select between 16-bit and 24-bit.

For descriptions of the other 100+ jsfx airwindows ports (covering dithers, compressors, console emulations, saturation/distortion, delays, bass-specific, brightness, hard and soft clippers, reverbs, tape/vinyl emulations, exciters, stereo wideners, monitoring utilities and more, please see the dedicated REAPER forums thread and import the airwindows JSFX ports repository into ReaPack.

D System Tweaks


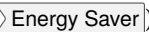
D.1 Windows

For a modern Windows 10/11 setup, required tweaks are minimal. Ensure that you are using ‘High Performance’ or ideally ‘Ultimate Performance’. which, if not available, can be activated by opening a command prompt and typing:

```
powercfg -duplicatescheme e9a42b02-d5df-448d-aa00-03f14749eb61
```

You can then select it from the usual power plan dialog. For best device performance, remember to use the ASIO drivers that were included with your audio interface. Consider disabling your network card during mission-critical recording. For further tips see Microsoft’s Unofficial Windows 10 and 11 Audio Workstation build and tweak guide. Of particular interest is Part 3 which discusses what *not* to do (including not setting your processor scheduling to ‘background services’).

D.2 MacOS

Performance should be excellent out of the box. Remember to disable energy saving ( ) so that sessions are not interrupted. Consider disabling your network card during mission-critical recording. If you are experiencing any audio issues while in your DAW, for tips see Focusrite’s optimisation page.

D.3 GNU/Linux

Debian-based distro users should read my Debian Pro Audio Guide. Those on Arch-based should visit my Arch Pro Audio Guide. Performance out of the box on Linux is getting better with every kernel release and is on par or better than Windows. As a starting point, ensure that your username is set up for realtime privileges (step 3 in both guides) and that you set several kernel parameters to ensure you are running the

performance governor, threadirqs and dynamic preempt (step 4). To make things even easier, consider using a dedicated audio/video distro like AVLinux or Ubuntu Studio where everything is already set up for you. *ReaClassicalOS* is also in the pipeline.

D.4 Cross-platform

The good news is that REAPER and ReaClassical run on nine different architectures. You should always be able to open up a project on another machine even if it is running a different OS. Plus, ReaClassical includes various mastering-grade plugins in JSFX format that run on all architectures.

E Manual Installation & Tweaks

(ideally for research only or if you already have a heavily-customized REAPER setup and wish to add all or just parts of ReaClassical)

- REAPER (obviously)
- SWS/S&M Extension
- ReaPack
- ReaClassical metapackage (includes ReaClassical default project template, custom themes and PDF manual)
- ReaClassical Resource folder base

So, the first thing is to install REAPER. I'll let you figure that out yourself. Next, install ReaPack into the UserPlugins subfolder inside the REAPER resource path. Then install SWS/S&M Extension either via ReaPack or by downloading the appropriate installer at SWS/S&M Extension (bleeding edge). Once that's done, start/restart REAPER. You'll then want to download the following from inside of ReaPack:

- ReaClassical
(by importing my index.xml into ReaPack then searching for 'ReaClassical')
- Various ReaClassical JSFX plugins (after importing my repo, search ReaPack for 'RCPlugs')

Now, extract the contents of the resource folder base somewhere outside of your REAPER install. You need to import one of the key map files from the KeyMap folder (Use 'ReaClassical' for a partial keymap covering the functions or 'Full_Classical_DAW' for the complete experience!). It's worth stating here in the main text my warning about backing up your own REAPER configuration before importing mine in case you want to get back to where you were.

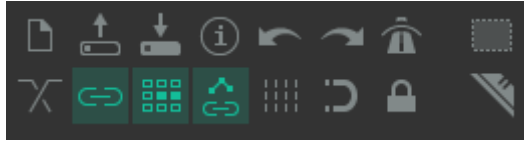


Figure 15: “Ripple editing per-track”, “Item edit grouping” and “move envelope points with media items” engaged...

E.1 ReaClassical Custom Toolbar

In order to install the toolbar, copy `ReaClassical.ReaperMenu` from `MenuSets` to the same folder inside your REAPER resource path. Next copy the icons from `Data/toolbar_icons` to the same folder inside your REAPER install.

In REAPER, right-click on an empty part of the main toolbar and select toolbar 1 (either open or float it). Select `Import/Export` in the top right corner and select the `ReaClassical.ReaperMenu` file. You should then see menu items and associated icons!

E.2 Things to do after installing

E.2.1 Main arrange window

- **UNCHECK** Auto-crossfade, grid lines (optional), snap¹ buttons
- **CHECK** Ripple editing per-track (as opposed to ripple edit all tracks), Item edit grouping, move envelope points with media items. See figure 15

¹We will prepare some snap settings later for adding CD markers but for now we don’t want dragging etc to be constrained.

E.2.2 Preferences

Some of these options are essential for the functions to work as expected. Others are just recommended.

Project > Item Fade Defaults

- **ENABLE** Create automatic fade-in/fade-out for new items, length: 0:00.010
- **ENABLE** Overlap and crossfade items when splitting, length: 0:00.010
- **ENABLE** Overlap and crossfade media when finalizing razor edits

Appearance > Peaks/Waveforms

- **UNCHECK** Draw faint peaks in folder tracks

Appearance > Fades/Crossfades

- **ENABLE** When editing crossfades with the mouse, use crossfade editor theme colours

Appearance > Track Control Panels

- **ENSURE** Folder collapse button cycles track heights is set to 'Normal, small, collapsed'.

Appearance > Zoom/Scroll/Offset

- `CHANGE` Offset by... percent of item height to 100²
- `CHECK` Draw as opaque

Editing Behaviour

- `SET` Locked item ripple editing behaviour to ‘Locked items are unaffected by ripple’³

Editing Behaviour > Mouse Modifiers

- `CHANGE` Razor edit area left drag default to ‘Move areas, disabling ripple edit’

E.2.3 Project Settings

- `CHANGE` Video > Frame rate to 75⁴
- `CHANGE` Render resample mode to r8brain free (highest quality, fast)

E.2.4 Theme Tweak

- Using the “Theme development: Show theme tweak/configuration window” action, search for “mute” and change the alpha blend to 0.00. See figure 16.
- Set the super-collapsed value to 0 in `rtconfig.txt`. See figure 17.

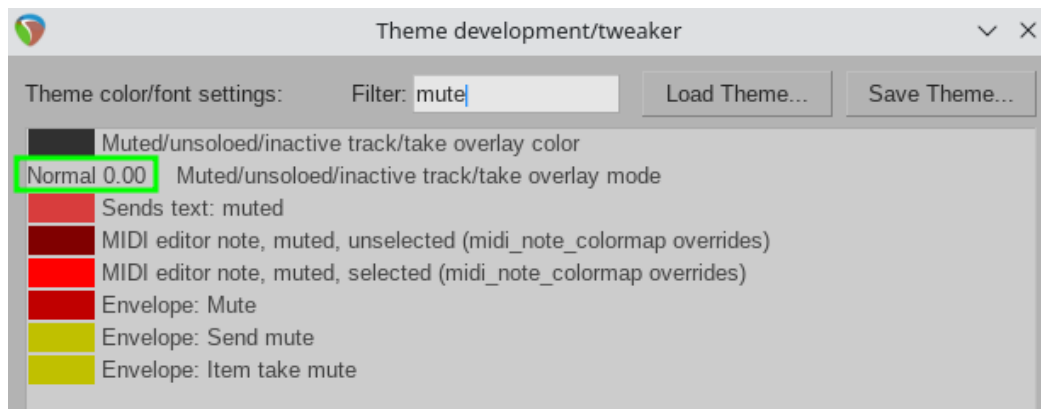


Figure 16: Setting mute overlay mode

```

penciluges v
no_meter_reclhl 1
tcp_heights 0 25 50 64 ; supercollapsed, collapsed, small(norecarm), recarm size
tcp_folderindent 0

```

Figure 17: Super-collapsed value is set to 0 in rtconfig.txt

At this point it might be a good idea to Save as default project settings as well as make a classical template (if you didn't download mine) so that you don't have to do this setup more than once.

²In REAPER versions prior to 6.54, these options don't exist. Instead, under *Appearances*, you need to change *Maximum number of lanes, when showing overlapping items* to 2

³Technically not necessary as it is now checked and set at the start of ripple-capable functions.

⁴The number of frames per second for red-book CDs.



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