
ReaClassical
Open Source Classical Music Editing Tools
24

The ReaClassical Manual

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Cover photography by Providence Doucet
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Contents

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 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 H (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.

3 Video Tutorials

Coming soon...

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 ReaPack 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 LyX (lyx.org)with the covers designed in LibreOffice Draw. The ReaClassical splashscreen and banner are created in GIMP.

11 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 Extensions > ReaPack > Synchronize packages 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

12 Install

12.1 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.

12.2 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 'RCPlugs' for the classical jsfx plugins. Note that 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. However, 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.

12.3 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.

13 Update

13.1 Updating an Existing ReaClassical Portable Install

Run the 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!**

13.2 Updating REAPER

Simply use the shortcut Ctrl + U to open the 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.

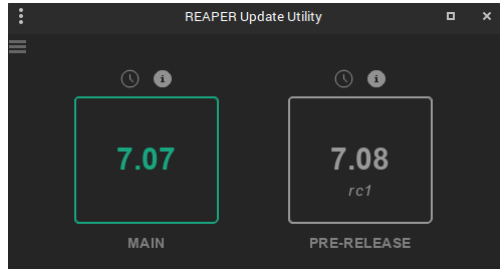

Figure 1: REAPER Update Utility

Part III

ReaClassical Workflows

14 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.

14.1 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.

14.2 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.

14.3 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 three remaining 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). 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.

14.4 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 everything else, I recommend using the vertical approach.

14.4.1 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 F7 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 F8 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 tracks you need. I highly recommend using the first track for the main stereo pair.

The F8 function creates six source groups based off the destination track group, links the volume, panning, polarity, mute, automation trim and hides everything in the mixer save for the first folder group. In other words, you can simultaneously control volume, panning, polarity and automation across all takes. It 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 F9 (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. Under normal circumstances moving one pan knob or fader would only affect that one group's channel. The ideal situation would be that changing a value on one channel would affect every other take in the same way, making comparing source material uniform in volume and panning. With the ReaClassical vertical workflow approach, this becomes a reality automatically!

14.4.2 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.

To begin a horizontal workflow, press F7 to set up a track group. 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 need to add another child track after you have started importing material, press Ctrl + T to add the track and then F7 again to re-group for media/razor editing.

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

15 Recording

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

15.1 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 source group, and you chose a vertical approach, simply press F8 to sync these settings to all source groups.

15.2 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.

15.3 Classical Recording

F9 begins 'classical' recording mode for whatever parent track is selected. You'll notice that the mixer intelligently selects the affected tracks and all tracks in the group are armed begin recording. To stop, press F9 again. This also automatically moves to, solos and arms the next available group. ReaClassical will automatically create new groups as required. To manually add more destination groups when not recording, press \.

15.4 General Recording

To record for a horizontal workflow or more generally (say a separate single mono narration track or similar), use the built-in REAPER record function arm the track(s) and then either press Ctrl + R or use the red record button.

16 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.

16.1 Importing Media

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

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.

16.2 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. Simply select one or more 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 folder 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!). It's important to note is that to use the Explode multi-channel item function you should import your multi-channel items into one folder track lined up horizontally before running the function. You can then drag to source groups afterwards.

17 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.

17.1 Whole Project

Use [`] (backtick) to see the whole project horizontally and/or [Ctrl]+[`] 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 [Home] or [End] key respectively.

17.2 Items & Markers

You can easily shuffle back and forth between items and markers by using the [Q] and [W] keys. You can move between markers by using the [,] and [.] keys (by design given on my 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.

17.3 Parents & Children

ReaClassical can hide or show children of track groups. This means that editing multitrack 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

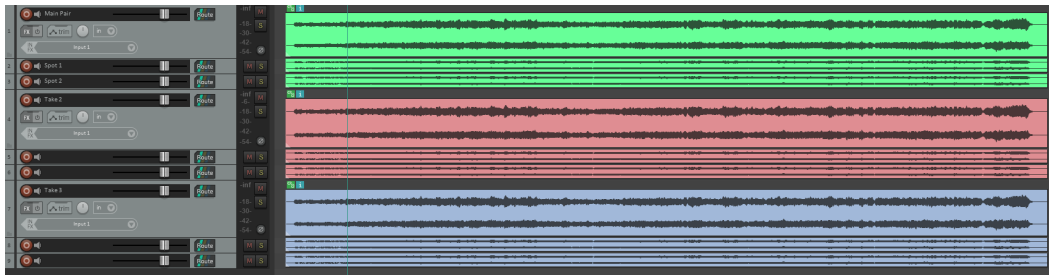

Figure 2: Uncollapsed Track Groups

children select the parent track and press D (for 'display'). To hide, select the parent track and press E (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.

17.4 Peaks Display

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

17.5 ReaClassical Toolbar

While I designed ReaClassical to be used efficiently with keyboard shortcuts, there is a custom 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.

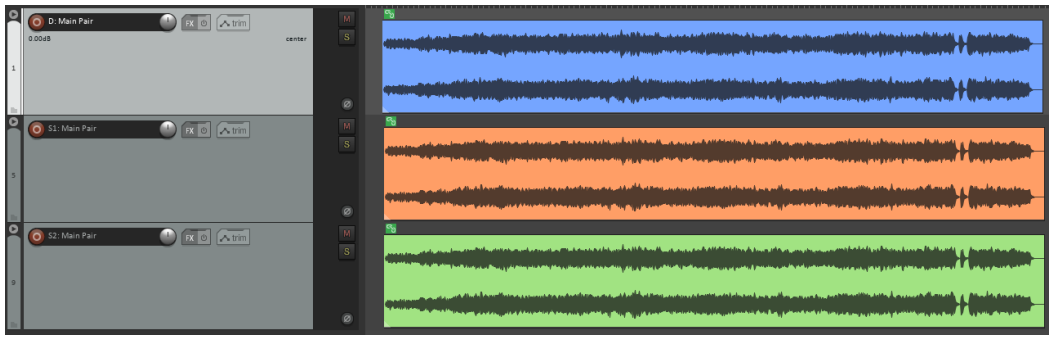

Figure 3: Collapsed Track Groups

18 Editing

18.1 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.

18.2 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.

18.3 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.

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. If you imported or recorded all your files in child tracks, the function will additionally 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. Note that if there are existing item overlaps and/or fades in the first track, Prepare Takes will be mainly disabled and only allow you to remove take names (in preparation for creation of CD markers). This is a safety feature given grouping already crossfaded items can lead to unexpected editing results.

18.4 Auditioning Takes

For horizontal editing, you can use the usual transport shortcuts (spacebar to start and stop playback, for example). For vertical (and horizontal) editing, it is highly rec-

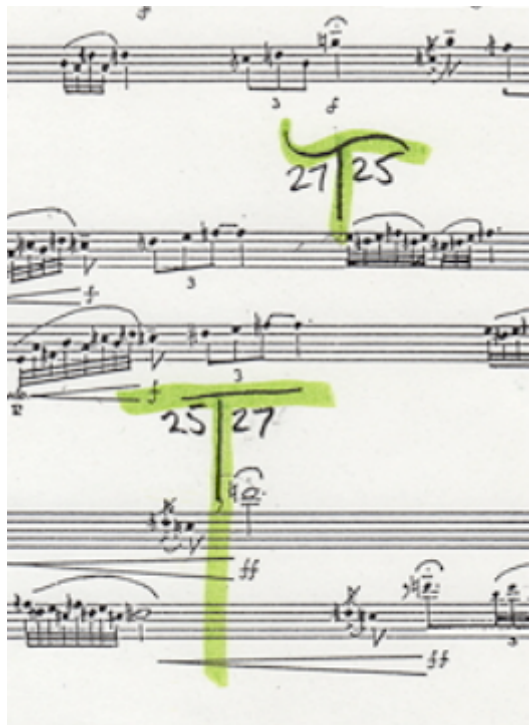

Figure 4: Marking edits on a physical score

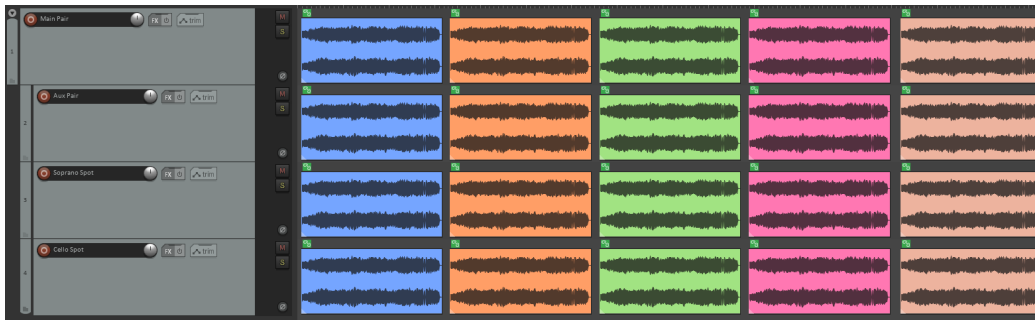

Figure 5: Horizontally Prepared Takes

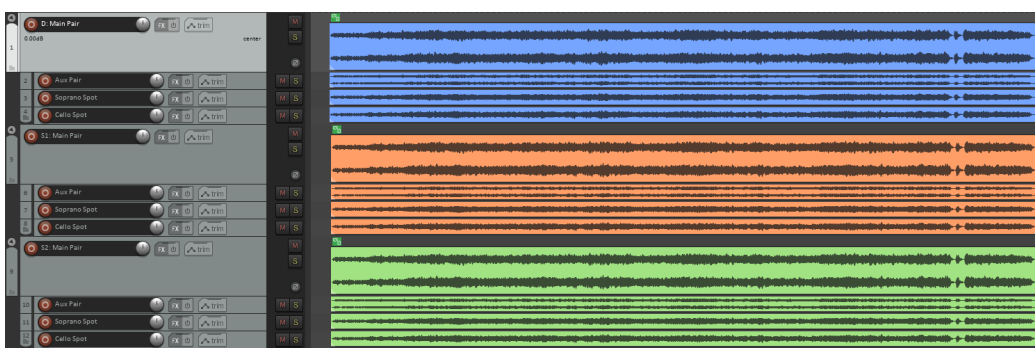

Figure 6: Vertically Prepared Takes

ommended to use the Audition function 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 . Note that similar to the Classical Take Record function, the tracks shown in the mixer are filtered based on what is being auditioned.

18.5 Source-Destination Editing

You set your in and out points using special coloured labelled markers via shortcuts 1 and 2 (Destination) and 3 and 4 (Source). Simply press 5 to make the 2-, 3- or 4-point edit. depending on how many markers you set.

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 (F5). 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.

18.5.1 4-Point Editing

For this operation, set all four markers using 1 , 2 , 3 and 4 . Make the edit with 5 . This is the most useful edit when dealing with classical music or other acoustic music performed without a metronome.

18.5.2 3-Point Editing

For this operation, set any combination of three markers. Again, make the edit with 5 . The missing marker is placed according to the distance set by the existing complete pair.

18.5.3 2-Point Editing

For this operation, set one source marker and one destination marker. Again, make the edit with 5 . 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.

18.6 Other SD Functions

18.6.1 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.

18.6.2 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.

18.6.3 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.

18.6.4 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.

18.6.5 Delete S-D markers

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

18.7 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.

18.8 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

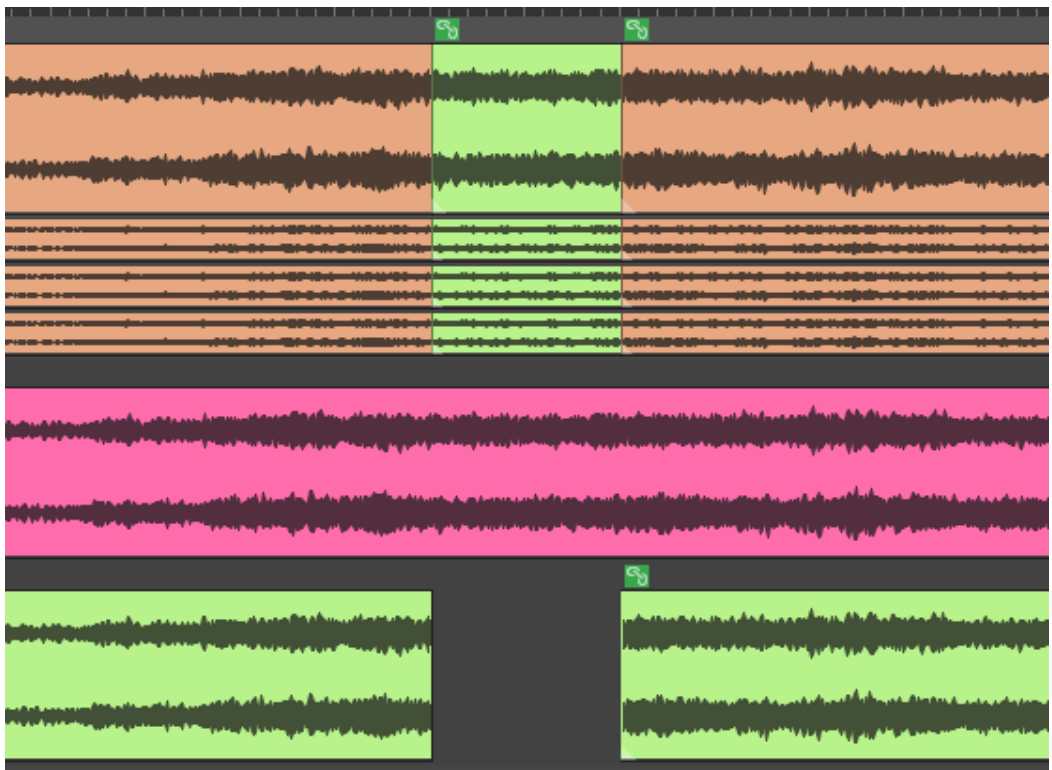

Figure 7: Razor Editing

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 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:

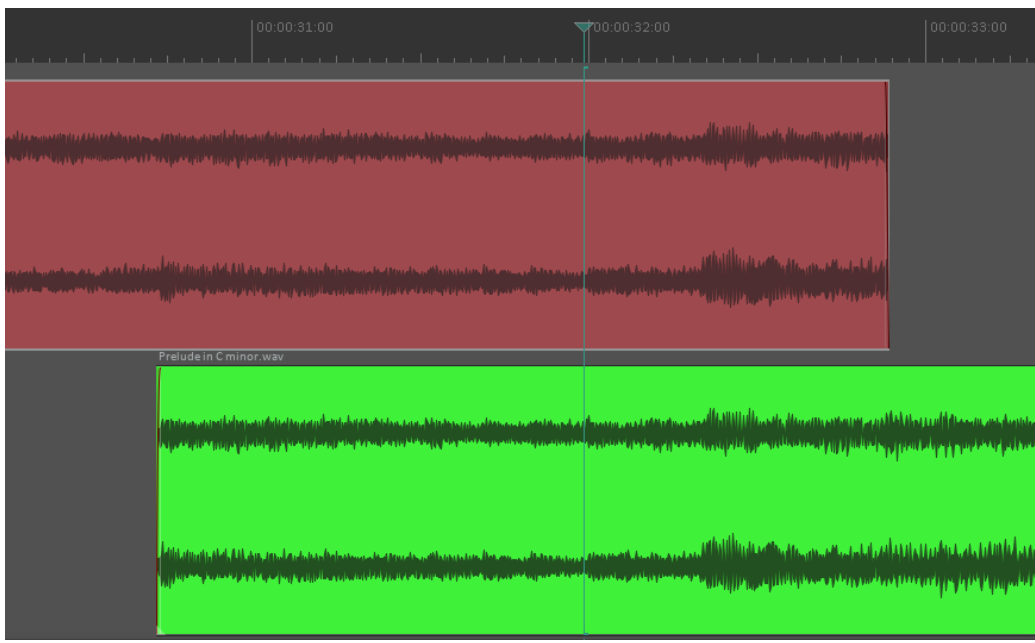

Figure 8: Crossfade Editor View

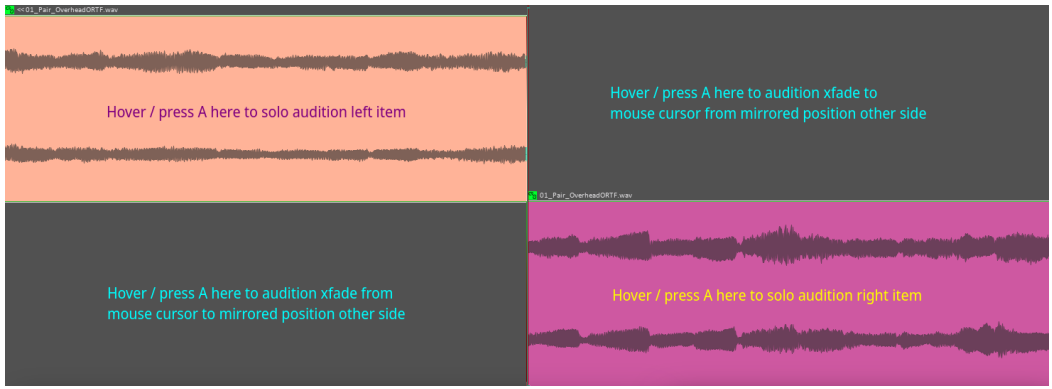

Figure 9: Crossfade Auditioning Tools

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
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).

18.9 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 is 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.

19 Mixing

19.1 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 recommended free plugins see Appendix C. For the purposes of the ReaClassical manual, you should add plugins to the destination group tracks and then press F8 to sync across all source groups. Most often my editing is done with no plugins enabled so that I can hear all the detail clearly. In my case, plugins are not generally added until the 'mastering' stage.

19.2 Aux & Submix

As of ReaClassical v23.19, users have the ability to create aux and submix tracks that stay visible (and stay after the source groups). To set up, simply create a single folder F7 and/or Create Source Groups F8 then create as many aux/submix tracks after the source groups as you like via the Add Aux or submix function @ . If adding manually, be sure to prefix the track with an ampersand. When using any of the functions that use intelligent mixer view (Audition, Create Source Groups (creating source groups from a single folder or syncing fx and routing), Classical Take Record, Duplicate Folder) these tracks will stay visible. Plus, any routing from the destination parent or child tracks to these tracks will be honored when syncing the fx and routing!

19.3 Roomtone

Information to be added soon...

20 Mastering

This has the potential to be a long section but I don't want it to detract from the main event: the S/D or razor editing workflows. A few pointers are in order though. In order to have CD markers that snap to CD frames, now is a great time to enable snapping (to frame) if adding them manually.

And then, of course, you can now quickly generate separate files via rendering all project regions or selected regions using a wildcard formula such as *$regionnumber - $region*. I include various useful presets in the render dialog. For those who insist on the absolute best resampling the world has to offer, export your WAV+CUE at highest resolution at 32-bit float and use a program like Saracon or FinalCD to get down to 44.1k/16-bit before generating the rest of your files in EZ CD Audio Converter (Windows), Fre:ac (all platforms) or similar. Alternatively, you can bring a long converted 44.1/32-bit float WAV back into a cloned project not forgetting to change the sample rate of the project to match. A lot of engineers use standard TPDF dither but you can always bring your favourite 3rd-party plugin to the party (as long as it is the final plugin on your master chain and your master fader remains at unity). I include a large number of world-class airwindows dither options in my other large jsfx collection available in the ReaClassical portable install.

20.1 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.

20.2 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.

20.3 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 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.

20.4 Creating DDP filesets

I have introduced a workflow to automatically add the CD/DDP markers and regions 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 countdown, 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!

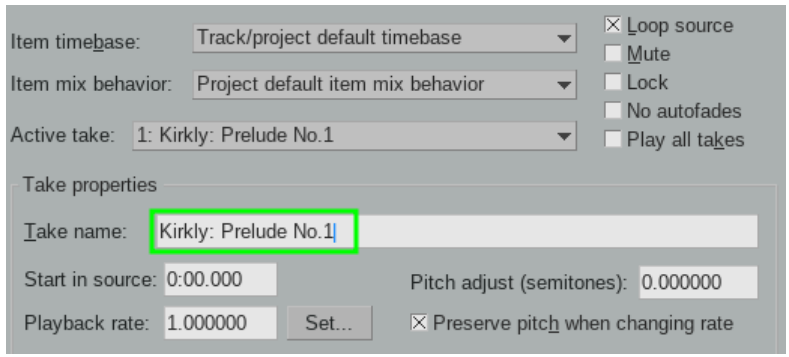

Figure 10: Adding Track names

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

20.5 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 preset.

20.6 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).

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: 'Lyrica' Prelude	GBR3C2300024
p	28:29:01	00:03:00		
07	28:32:01	05:34:14	Whittaker: 'Lyrica' Fugue	GBR3C2300025

Figure 11: An example of an automatically generated HTML album report

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

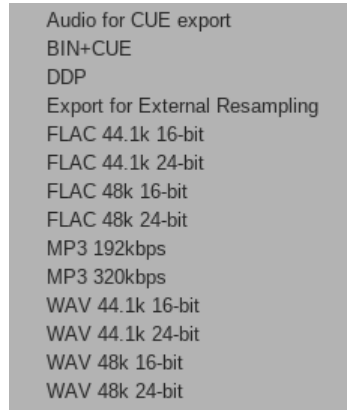

Figure 12: ReaClassical Render Presets

21 Rendering

21.1 Presets

ReaClassical includes various rendering presets to make rendering extremely quick and easy. In the Render dialog [R], 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 [Y] 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.

21.2 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 C 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.

21.3 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.

21.4 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.

21.5 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.

21.6 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.

22 Project Management

22.1 Typing Notes

Document your takes either using the built-in REAPER project notes or SWS Notes N (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.

22.2 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 O (for 'Options').

22.3 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.

22.4 Cleaning

If in doubt, keep everything! Otherwise, the File > Clean current project directory is an excellent way to reduce the size of your projects.

22.5 Archiving

There are various ways to archive classical music projects. First, you can access the Project Bay by Ctrl + B 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 File > Save project as..., 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

23 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.

24 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 Folder 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-group tracks for media item and razor editing.

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.

Create Source Groups (vertical) 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 track grouping and to sync routing/fx between destination (the top folder and its children) and source groups. Note that for 3), all folders must contain the same number of tracks.

Notes: Whether you start with an empty project or use an existing folder group or groups, the end result will be the same. Folders and tracks will be grouped according to pan, mute, editing, phase, trim and fader. So, for example, the second track of each

group will all respond to a fader movement. This is essential for being able to audition different source groups with the same settings. Note also that running the function engages an intelligent mixer view where only the soloed group is shown in the mixer. You can see this in action by using the Audition function [A] which auditions audio at the mouse cursor. Watch as the mixer view changes which tracks are visible.

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 Aux/Submix track to end of tracklist [@]

Description: Add a green (#4c9165) aux/submix 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/submix tracks visible in the intelligent mixer. Create any connections to the aux/submix in the destination group (including child tracks) and then push to the source groups via the *Create Source Groups* function [F8] .

Hide and Show child tracks [D] and [E]

Description: Hide child tracks to save screen estate and for working with multi-channel takes as if working with just stereo.

Notes: Select a folder track and press [D] to hide the children or [E] 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.

Classical Take Record [F9]

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

Notes: To use, highlight a folder, position the edit cursor and press F9 . Press again to stop the recording. To immediately start a new take, simply press F9 again. Note that the next folder is selected 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.

Prepare Takes T

Description: Intelligently prepares recorded or imported takes for source-destination editing.

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: After you have started making S-D edits, the function will no longer offer to group or colour items due to potentially unexpected editing behaviour. The function was designed for use after initial recording or importing of media only. It will still offer to delete any existing take names after a user-friendly message. A reminder that the new REAPER native grouping (when set up via Create Folder or Create Source Groups sripts) 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: Now that Classical Take Record F9 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 K

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 A

Description: Mouse-driven auditioning of folders or individual tracks that uses intelligent mixer views.

Notes: Simply hover the mouse over an area of the project and press A to begin auditioning the audio. Hover over a folder track to hear the complete mix or a single track within a folder for listening to individual instrument or sections. Again, it is good to note that when auditioning begins, the mixer updates intelligently, decluttering the view for ease of meter monitoring etc. Note that the function honors any aux or submix tracks (@) and keeps them in the mixer view.

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 Ctrl + `

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 F5

Description: Set S-D crossfade length, CD track offset and INDEX0 pre-gap length, album lead-out time.

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* Y 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.

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. 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.

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 .

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.*

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 .

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.

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.

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 .

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 and UPC/ISRC codes 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.

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 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.

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 C

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

Home	Project Start
End	Project End
`	Whole Project View (Horizontal)
Ctrl + `	Whole Project View (Vertical)
Ctrl + ↑	Increase peaks display zoom for project
Ctrl + ↓	Decrease peaks display zoom for project
Q	Previous Item / previous crossfade (when in crossfade editor view)
W	Next Item / next crossfade (when in crossfade editor view)
,	Previous Marker
.	Next Marker
K⟷I	Move to item peak value (SWS)

Folder & Source Group Preparation

F7	Create Folder (prompts for number of tracks)
F8	Create Source Groups (vertical)(from scratch or from existing folder) / Sync Routing/FX
F10	Explode multi-channel items (polywavs)

\ Duplicate Folder (no items)

@ Add Aux or Submix track to end of mixer

Recording & Take Management

F9 Classical Take Record

T Prepare Takes

K Colorize (add custom color to item group)

Editing

A Audition (folder or track) at mouse position

D Display child tracks

E Ensconce (hide) child tracks

S Split item

J Join (glue) item

G Group items

U Ungroup items

I Swap marquee and razor edit modifiers

F Open ReaClassical Fade Editor

X Create a classical crossfade

Z Extent crossfaded items for editing (when in ReaClassical Fade Editor view)

V	Toggle per-track ripple editing

S-D Editing

1	Add Destination IN marker
2	Add Destination OUT marker
3	Add Source IN marker
4	Add Source OUT marker
5	Make S/D Edit (2-, 3-, or 4-point cut)
F3	3-point 'Assembly Line' edit
F4	Insert with time-stretching (All 4 S-D markers)
←	Delete with ripple (between 2 source markers)
Ctrl + ←	Delete Leaving Silence (between 2 source markers)
Ctrl + 1	Move to Destination IN marker
Ctrl + 2	Move to Destination OUT marker
Ctrl + 3	Move to Source IN marker
Ctrl + 4	Move to Source OUT marker
Alt + 1	Zoom to Destination IN marker
Alt + 2	Zoom to Destination OUT marker
Alt + 3	Zoom to Source IN marker
Alt + 4	Zoom to Source OUT marker

Ctrl + Del. Delete all S-D Markers

Mastering

Y Automatically generate DDP markers 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 items

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)
O	Options (Preferences)
P	Project Settings
B	Batch file converter
Ctrl + U	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, 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, 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.

Compression:

- **RCCompressor** (ReaClassical compressor, 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, 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, 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 Samplicity 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 portable install.

Restoration:

- **Bertom Denoiser Classic** https://www.bertomaudio.com/. **Denoiser Pro** ($25) allows for individual per-band thresholds and includes an adaptive mode.

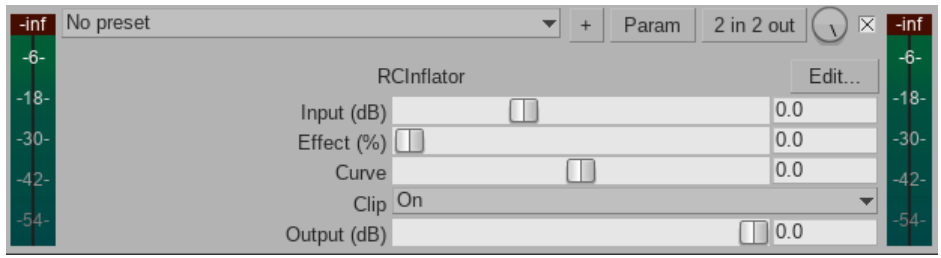

Figure 13: RCInflator

- **RCDeEss Standard** (ReaClassical de-esser, available in my repository). Uses DSP from airwindows DeEss.
- **RCDeEss Advanced** (ReaClassical advanced de-esser, available in my repository). Uses DSP from airwindows DeBess.

Utilities:

- **RCGain** (ReaClassical gain plugin, 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).
- **RCDither** (ReaClassical dither plugin, 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 70+ 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 repo 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 Focusrite's optimisation page.

D.2 MacOS

Performance should be excellent out of the box. Remember to disable energy saving (System Preferences 〉 Energy Saver) 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. *Rea*ClassicalOS 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 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 SWS Extension (bleeding edge) and ReaPack into the UserPlugins subfolder inside the REAPER resource path. 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.

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! See figure 14.

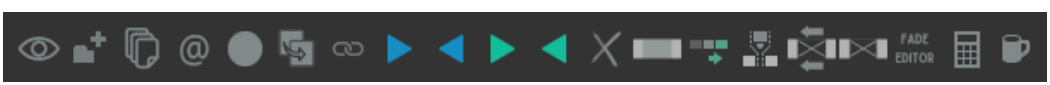

Figure 14: ReaClassical custom toolbar

From left to right, we have: Whole project view Horizontal (‘), Create (or Sync) Source Groups (F8), Classical Take Record Toggle (F9), Duplicate Folder (\), Prepare Takes (T), 3-point ‘Assembly Line’ Edit (F3), Destination IN and OUT markers (1, 2), Source IN and OUT markers (3, 4), Delete S-D markers (Ctrl+Delete), S-D Edit (5), Delete With Ripple (Backspace), Delete Leaving Silence (Ctrl+Backspace), the Fade Editor View (F), Reposition Album Tracks (Ctrl+Y), and, finally, Create CD Markers (Y).

E.2 Things to do after installing

E.2.1 Main arrange window

- Uncheck Auto-crossfade, grid lines (optional), snap[1] buttons

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

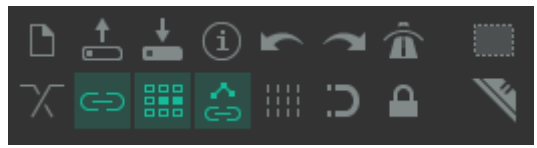

Figure 15: “Ripple editing per-track”, “Item edit grouping” and “move envelope points with media items” engaged...

- Check Ripple editing per-track (as opposed to ripple edit all tracks), Item edit grouping, move envelope points with media items. See figure 15

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 100[2]
- 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'

[2] In 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

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

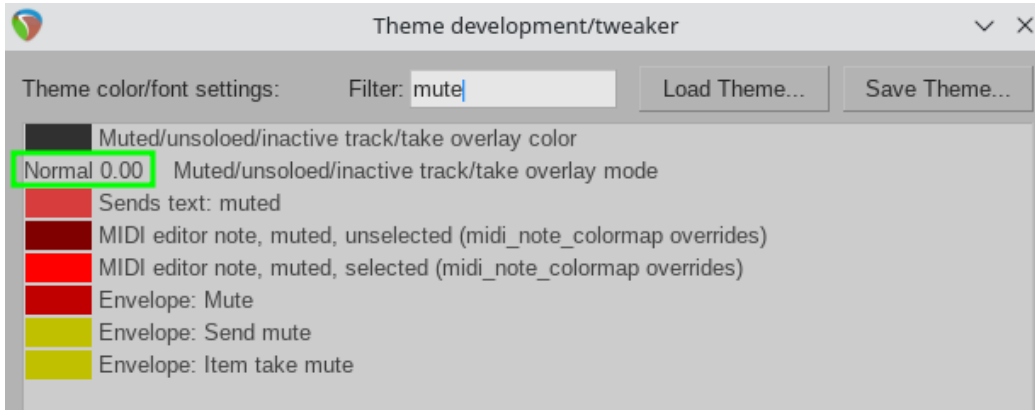

Figure 16: Setting mute overlay mode

E.2.3 Project Settings

- Change Video > Frame rate to 75[4]
- 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.

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

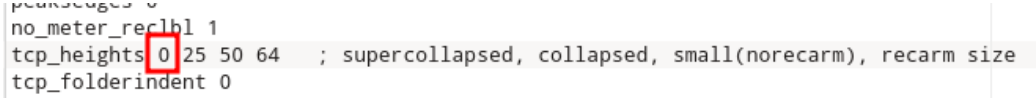

Figure 17: Super-collapsed value is set to 0 in rtconfig.txt

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.


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