BethHarmon's Guide to Classical Editing in REAPER

Linux, Windows & MacOS

6th April, 2022 (v1.0)

Preliminaries

First up, it is important to note that if you already own REAPER then the world of classical editing including source-destination editing (aka 3-and-4-point editing), crossfade editing and more are available at no extra cost[1] to you via freely available custom actions, Lua scripts etc. There's no need to spend any extra money on Sequoia, Pyramix or SaDiE. There's certainly absolutely no need to spend any of your hard-earned money on certain classical-based apps that are essentially a modified REAPER install. 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. Your mileage may vary and I'd love to hear from you if there are functions you feel are missing. The only downside I can see is that it might take you a little while to get everything set up but there's a real benefit to walking through step-by-step and understanding why things are set the way they are. It also enables you to tweak to your own liking later on if you'd rather do things a little bit differently.

What you need

- REAPER (obviously)
- SWS Extension, ReaPack
- Various scripts from both ReaPack and my Github repo[2]
- Key map file & keyboard shortcut guide from my Github repo[3]
- Classical RPP template from my Github repo[4]

So, the first thing is to install REAPER from https://www.reaper.fm/download.php. I'll let you figure that out yourself. Next, install SWS Extension and ReaPack from https://www.sws-extension.org/ and https://reapack.com/ respectively. Once that's done, you'll want to download the following from inside of ReaPack (scripts I consider optional are in italics):

- Source-destination edit by Paweł Łyżwa (by importing https://ply.github.io/ReaScripts/index.xml into ReaPack)[5]
- Solo exclusive track under mouse and play (X-Raym)
- *JS reascript API (juliansader)*
- *Various_functions (MPL)*
- *Generate CUE from project markers (MPL)*
- *RCInflator (Oxford)*

---

1 Obviously, it would be fantastic if you can show support to the script writers by either sending them some money or giving your time to help improve the scripts or report bugs.
2 https://github.com/ElizabethHarmon/REAPER-Classical-Editing
3 N.B. Before proceeding, I recommend doing a backup of your current key map. When importing my key map into your installation of REAPER some of your shortcuts will no doubt be overwritten.
4 Entirely optional, but it might save you a little time. In this document I go through step-by-step how to set up in any case.
5 Via Extensions → ReaPack → Import Repositories...

Now, you need to import my scripts and choose one of the key map files (I recommend the complete one if you want the full experience!). It's worth stating here in the main text the warning about backing up your own REAPER config before importing mine in case you want to get back to where you were.

Things to do after installing

Main arrange window

Uncheck *Auto-crossfade*, *grid lines* (optional), *snap*[6] buttons

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

Preferences

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

Project → Media Item Defaults

Enable *Overlap and crossfade items when splitting, length: 0:00.010*

Enable *Overlap and crossfade media when finalizing razor edits*

Appearance (main section)

Change *Maximum number of lanes, when showing overlapping items in lanes* to 2

Appearance → Fades/Crossfades

Enable *When editing crossfades with the mouse, use crossfade editor theme colors*

Project Settings

Change *Video → Frame rate* to 75[7]

Change *Render resample mode* to *r8brain free (highest quality, fast)*

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.

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

7 The number of frames per second for red-book CDs. See previous footnote.

Classical Workflows

Recording

I don't have too much to say here other than suggest you follow the various guides already out there on the internet. Hopefully you are already familiar with how to set up your equipment, set audio device settings, record arm and the like. If not, take some time now as it will really pay off in the long run. Some quick tips: record into 24-bit WAV files (the default) and aim for -12dB or so peaks[8] versus trying to get as close to 0dB as you can. Document your takes either using the built-in REAPER project notes or SWS 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.

I include a duplicate tracks (no items) action which can be added to the track right-click menu for a quick way to add more empty tracks from your first recording set (in case you enjoy vertical take management (see below under Editing). My personal preference is to either to just run the recorder for the whole session or start new items for every take horizontally in the project.

Editing

Introduction to the various editing workflows

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 which I will explain in detail after this brief introduction. I personally have always enjoyed doing my S/D editing within the one project window but if you use Paweł Łyżwa's (ply) scripts you shuttle back and forth between two project tabs: one for your source material and one for your destination material. In the single-window workflow you have multiple ways of proceeding. First you 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 button to achieve your 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 action to make precise edits really easy in REAPER. I don't even use the fade editor that comes with REAPER even though I include it in the custom action.

Preparing your recorded takes for classical editing

Whichever method you end up choosing you need to prepare your takes in an appropriate way.

For multiple project tab or single-window horizontal approaches, you can use the *Prepare Takes for Classical Editing* custom action. Place your edit cursor just before the first set (it's good to leave a little bit of space at the start of your project) and repeatedly press the shortcut (my default is T[9]) until you reach the end of you project and every set of items comprising a take has changed colour and is now grouped.

8 You can record a lot lower and still be above the 16-bit noise floor but this isn't the document to go into it in detail.
9 From now on, you can assume that all shortcuts mentioned are all the ones included in my key map

For vertical classical editing of any kind, it's either a two- or three-step process depending on how you captured the audio in REAPER. If you recorded all in a horizontal row, just use the same T shortcut and then drag all your takes until they are vertically aligned on their own tracks. Essentially, what you are looking for is your master tracks having your best overall takes of each piece/movement horizontally with all the corresponding takes underneath as vertically aligned as is achievable (allowing for tempo variations) to make finding alternative takes as simple as possible.

In the situation where you recorded by duplicating tracks and exclusive soloed just the record-armed tracks, you can use two custom actions: V*ERTICAL Color It!* and *VERTICAL Prepare Takes for Classical Editing*. It's not complicated. Just select each set of tracks (your main pair, aux pairs, any spot mics etc) and use V*ERTICAL Color It!* Followed immediately by *VERTICAL Prepare Takes for Classical Editing* until you reach the end of your project. Rinse and repeat for each set of vertical takes.

That's it! So, with that introduction and preparation done, let's dive into each option in more detail.

Two project tab S/D editing using the ply scripts[10]

For a video of it in action see https://www.youtube.com/watch?v=tpULzVtsdUI. It's a bit tortuous with all the repeated listening to the same music but you at least get a sense. I work a lot quicker than this in general and I feel that the custom crossfade editor makes the tweaking of cuts FAR more efficient than using the built-in crossfade editor.

In order to use the ply source-destination scripts you first use the ply_Source-Destination setup script (F10) which creates the second project tab. You can also run the configuration script (F9) which is included but I don't think I ever needed to. You make your source and destination in-out points using simple time selections ([and]) and then run the edit action (NumPad 5). I also include a shortcut for switching tabs (NumPad +).

Single-window S/D editing (horizontal)

As mentioned earlier, this is my own favourite method. You set your in-out points using special coloured labelled markers I created with Ctrl+Home and Ctrl+End (Destination) and Shift+Home and Shift+End (Source). Simply press Insert key to make the 4-point edit. You'll also notice that because you prepared the various takes with colors (and grouping), it is really easy to see which takes compose your final edited tracks. It's worth pointing at this point that my S/D and classical crossfade actions place the short 10ms crossfade immediately before the entry and exit points. What this means in practice is that when you select source in-out points or place the cursor for a classical crossfade (see below) is already out of the crossfade. As an example, when you decide visually or aurally that you want an edit immediately before a transient[11], it will be at that exact point having crossfaded 10ms previously. A lot of the time with this setup, I don't even need to visit the crossfade editor view.

---

10 For a detailed guide on how to install ply scripts see here: https://urosbaric.com/updated-scripts-for-3-4-point-editing-in-reaper-6

11 I highly recommend this as the default starting point to mask edits. Ideally you have the luxury of always making your edits during moments of pure room noise but it never seems to work out that way in practice! For a good read see https://www.soundonsound.com/techniques/creative-editing especially the "Editing Tips" section but I can assure you that default, short equal-power crossfades before transients cover 99% of classical edits.

Single-window S/D editing (vertical)

You will have already prepared the audio as discussed above for vertical editing. In this setup, you will use the same source-destination shortcuts as for the single-window horizontal takes workflow (Ctrl/Shift + Home/End) other than for the actual edit you should use the *VERTICAL One-Window S/D Editing action* instead. Assign that to your own shortcut (or overwrite my regular one) if you'll be using that most of the time.

The downside to this workflow is that the source and destination markers can get in each other's way visually but the process still works as expected.

Single-window S/D editing (vertical using razor edits)

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: https://www.youtube.com/watch?v=wQXwnvITQCQ. While Pyramix also has standard source-destination marker workflows, I couldn't help but feel that for professional ensembles that manage a high degree of tempo regularity between takes, it 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 running the action *Swap arrange view…* or selecting it under Preferences → Editing Behavior → Mouse Modifiers → Context: Arrange View (phew!). It's probably worth having a shortcut set up, to be honest.

NOTE: I highly recommend turning off ripple-per-track mode while razor editing so that you don't mess up alignment of your master track items and associated crossfades[12].

OK, so now you have your area selected, simply left drag to move it on top of your destination track(s). You can control drag if you prefer to just copy. Notice that if you set up razor edit preferences as I recommended above, the finalized edits will include crossfades either side and trim material that was previously underneath. It's a carbon copy of the above Pyramix workflow.

Now that you've made your precise edits (not to worry if not!) using S/D workflow or razor editing, it's time to turn back on the ripple-per-track mode and check things through with a good listen and the help of the crossfade editor view.

Crossfade Editor Mode (F)

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[13]. 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? Press F and you are moved into crossfade editor mode. Here, the first track is given full vertical zoom, the two-lanes for

12 As of writing the first version of this guide, I have put in a feature request that razor edits might occur while being able to ignore the ripple mode.

13 If that made no sense and because a picture is worth a thousand words see: https://tinyurl.com/2nh7sxpb. While not the best quality image, you can see the greyed out (non-sounding) waveforms either side of the crossfade.

overlapping items is enabled and the fade editor toolbox appears (I position it to hover over the middle of my mixer. Press F again and you exit that mode. If for some reason you accidentally close just the fade toolbox etc I provide two shortcuts to help get you back to the correct view (F5 and F6 which toggles the zoomed-in first track and two-lane view, respectively. If you just press the shortcuts you are supposed to (F), you won't have any issues.

So, now you are in the crossfade editor mode, you can click on the left item[14] of an overlap (crossfaded or otherwise) and press Z to automatically 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 left item, place the edit cursor just before it, then drag my 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 Z shortcut or manually dragging out edges of each item)
2. Find transient in left item that you want be edit point
3. Place edit cursor just before it
4. Drag right item to align transients
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

You can also forego the Z shortcut and just manually drag out the item edges as much as you like. Given we grouped the tracks as part of the preparation, you'll notice when you drag one edge it drags every other track in the group too. You can audition with the crossfade toolbox which limits the start and end of playback. Don't forget that you can shuttle between crossfades using the next and previous buttons. Once you have your perfectly edited master track(s), you can leave the fade editor mode by pressing the F shortcut again.

Other Editing Tips

In my key map, I include all sorts of useful shortcuts to use during editing. In vertical editing workflows, the Audition (Solo exclusive track under mouse and play) via shortcut 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, 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 etc. There are plenty more for the mastering end of things so I encourage you to explore. There's no rocket science here, simply reasonable single-key shortcuts for actions that are already in REAPER or available via ReaPack.

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). I add the CD/DDP markers (if

14 Essential for the custom action to function properly

not already present), create regions from the markers by double-clicking in the ruler between markers then pressing # (create region from time selection). In a typical classical album this takes no time at all but I wish there was a “create regions from markers” instead of the current SWS “Convert regions from markers”. In any case, you can then use the project regions in the render dialog or use the SWS autorender tool. For those who insist on the absolute best resampling the world has to offer, export your WAV+CUE at highest resolution at 24-bit or 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[15]. Alternatively, you can bring a long converted 44.1/32-bit float or 44.1/24-bit 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 used to use the MPL function to export CUE files so I could use an external resampler (such as Saracon, RX, SoX etc) to get to 44.1/16-bit for published files and then create my DDP via a 3rd-party tool such as the DDP Mastering Tools by Andreas Ruge[16]. 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[17] creation, without leaving my favourite DAW.

You will hopefully notice I have included various shortcuts for creating regions (single or multiple) from items and time selection. 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.

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 combined 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.

Under prerequisites, I included the optional RCInflator which is a clone of the Sonnox Inflator that I had a hand in bringing into this world with its current capabilities of being to null test, almost perfectly[18], against the Sonnox version[19]. I have a soft spot for it on a master but, again, there are plenty of guides on how best to use it in production.

15 I’ve heard it’s best to generate all your lossy files from the 44.1/16-bit in order to maintain some quality control over the process.

16 http://ddp.andreasruge.de/

17 At least in 2022, people, me included, still seem to find value in having a physical classical disc to hand with accompanying booklet and beautiful artwork.

18 To the tune of differences down at -144dB or something similar.

19 I was the OP on the thread https://forum.cockos.com/showthread.php?t=256286 as well as producing various files to aid in the nulling of the two plugins. I also matched the default values and ranges to those of the Sonnox but otherwise had no hand in the actual coding of the plugin.

Closing thoughts

I hope you enjoy the ability to do serious classical editing on REAPER and that my efforts go some way to making things better, easier and more efficient. If you find any oddities with the custom actions or scripts, please add to the dedicated thread on the forums and/or create an issue on my github repo located at https://github.com/ElizabethHarmon/REAPER-Classical-Editing. I'm happy to hear about potential improvements/additions and now that I'm gotten my feet wet with some very basic Lua scripting, I hope do more things in that direction.

Thanks

I am appreciative of the collective contributions of the REAPER community with regards the early source-destination actions, to bachstudies for his original one-window S/D edit function, classical crossfade and other associated classical "helpers", to ply for the most up-to-date two-tab S/D editing workflow, MPL, X-Raym, RCJacH, Sai'ke and many more whose skills provided the rest of the scripts described in this guide. Finally, many thanks to Justin and Schwa for such an amazingly versatile DAW.