ReaClassical

Open Source Classical Music Editing Tools

v23.21pre11

Tested on REAPER v6.80

Typeset in LyX using TeX Gyre Heros font

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 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. Your mileage may vary and I'd love to hear from you if there are functions you feel are missing. There's an easy install option below as well a step-by-step manual approach.

What you need

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 https://reapack.com/user-guide#import-repositories) 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. 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 scripts to work as expected.

Easy Complete Portable Installation (recommended)

1. Follow the installation instructions here. In short, if you are on Linux, use this script, on MacOS, this script, or on Windows, this executable to take care of completely setting up ReaClassical from scratch (including the downloading REAPER and setting up as a portable install). Simply run where you would like the folder to be created.

2. Start REAPER.
3. Sync ReaPack to get the very latest ReaClassical scripts.

Skip to reading about classical workflows on page 4...

Easy Update of an Existing ReaClassical Install

1. Sync ReaPack to get the latest version of the ReaClassical metapackage.
2. Download the latest portable install as per the instructions above (it will create a new ReaClassical folder with a short year + quarter suffix e.g. "ReaClassical_23Q2").
3. Copy across any updated files/settings to your previous install according to the release notes.

Manual Installation (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 guide)
- 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 scripts 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.

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 1.

Figure 1: ReaClassical custom toolbar

Figure 2: “Ripple editing per-track”, “Item edit grouping” and “move envelope points with media items” engaged...

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), Toggle for choosing 3-point edit behaviour (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).

Things to do after installing

Main arrange window

- Uncheck Auto-crossfade, grid lines (optional), snap[1] buttons
- Check Ripple editing per-track (as opposed to ripple edit all tracks), Item edit grouping, move envelope points with media items. See figure 2

Preferences

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

Project > Media Item 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 > Media Item Positioning

- 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]

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

[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.

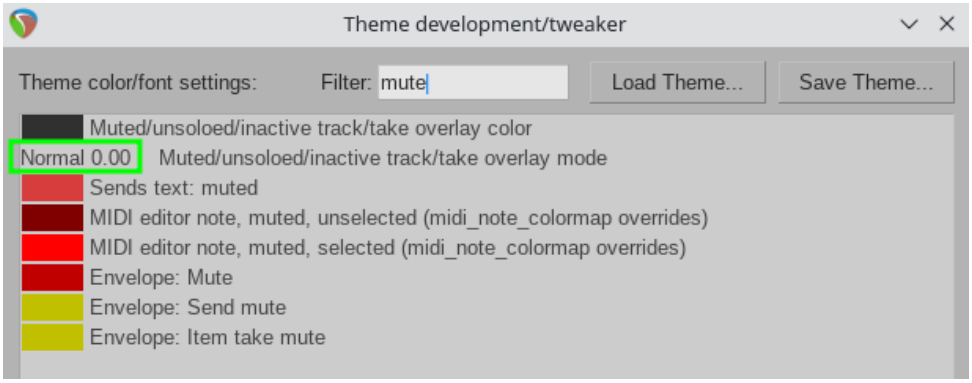


Figure 3: Setting mute overlay mode

Editing Behaviour > Mouse Modifiers

- CHANGE Razor edit area left drag default to "Move areas, disabling ripple edit"

Project Settings

- CHANGE Video > Frame rate to 75[4]
- CHANGE Render resample mode to r8brain free (highest quality, fast)

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 3.

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.

Classical Workflows

Creating Folder tracks

Horizontal Recording/Editing

For horizontal recording and editing, create a single folder with your various channels (main pair, aux pair, spots etc) using the *ReaClassical_Create Folder* script (F7). you don't have to do any more setup because essentially you already have one mixer set for all the various takes. With vertical recording/editing we need to be a bit more creative.

Vertical Recording/Editing

For vertical recording, start with an empty project and run *ReaClassical_Create Folder* script. It will prompt you to enter how many tracks you'd like in the folder. Record using the *ReaClassical_Classical Take Record* function and new empty folders are created as required. Or, if you already have recorded material to import and edit, start with an empty project and run *ReaClassical_Create source groups (vertical).* This is similar to the previous function but it also creates all the source groups too. Easy! You can also choose to run this after

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

creation of a single folder. This time it just creates the additional source groups. The script creates 6 source groups based off the destination/master folder, 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 6 source groups, simply create them on the fly with the *duplicate folder (no items)* script but note that, as of v23.17, Classical Take Record creates a new source group as needed after ending recording.

A typical scenario: You have vertically recorded, or vertically prepared, multiple takes of a concerto movement with 10 channels. You realize half-way 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 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!

Routing and FX: If you want to make any changes to routing or FX, apply them to the first folder (the destination) and then simply run the *ReaClassical_Create source groups (vertical)* script again and it will automatically push routing and fx to the source groups. All items and edits will remain untouched. Note that for v23.19 onwards, this includes any and all routing for the child tracks as well as routing to aux/submix tracks (see below).

ReaClassical Aux and Submix tracks (new!)

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* script. If adding manually, be sure to prefix the track which an ampersand (@). When using any of the scripts 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!

Recording

I don't have too much to say here other than suggest that you follow the various guides already out there on the internet. Hopefully you are already familiar with how to set up your equipment[5], 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[6] 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 (N) 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 folder (no items)" script (via backslash shortcut) for a quick way to add more empty folders (and their children) from your first recording set (in case you enjoy vertical take management (see below under Editing). You can either 1) run the recorder using the regular REAPER record function for the whole session, 2) stop and start for each new take continuing in a linear fashion along the timeline, or 3) if you want to record takes vertically in preparation for editing that way, I've included a handy "classical take record" script. Position your play cursor, click on a folder track then press the shortcut (F9) to record and press the same again to stop. The script automatically moves to the next folder with the cursor at the same start position so you can immediately press F9 again. If not present, a new folder is created. Note that the tracks shown in the mixer are filtered based on which tracks are currently recording.

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.[7]

[5] For live concerts (i.e. critical one take), I actually prefer to use a SoundDevices MixPre II unit.

[6] 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.

[7] Note that with REAPER it is also possible to record to a second drive as an invisible backup while on location.

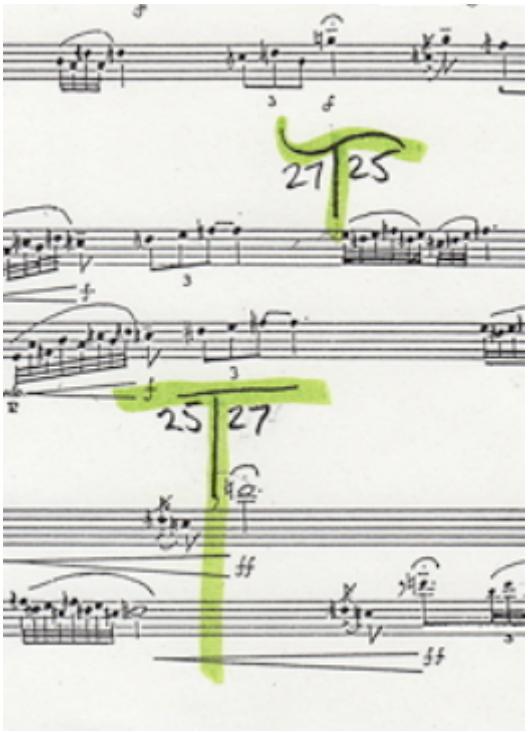


Figure 4: Identifying edit locations on a score

Importing

If you recorded your items in a different session, DAW or portable recorder, you should first create a folder (F7) or folders (F8) the size of the number of channels you plan to import. Import the item(s) onto the folder track itself. Then, if importing multi-channel 'iso' media, select one or more items and run the 'Explode multi-channel item' script (F10) and then say 'yes' 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 Prepare Takes (T) script is able to create a muted guide track. Important to note is that to use the Explode multi-channel item script you should import your multi-channel items into one folder track lined up horizontally before running the script. You can then drag to source groups afterwards.

Editing

Marking the edits

This is best done using a physical, photocopied[8] score by the conductor or lead musician. I advocate for a "T" system[9] 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. See figure 4.

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. I will explain each in detail after this brief introduction. 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

[8] Or printed public domain score where possible.

[9] As described by Frank Lockwood at https://www.lockwoodars.com/

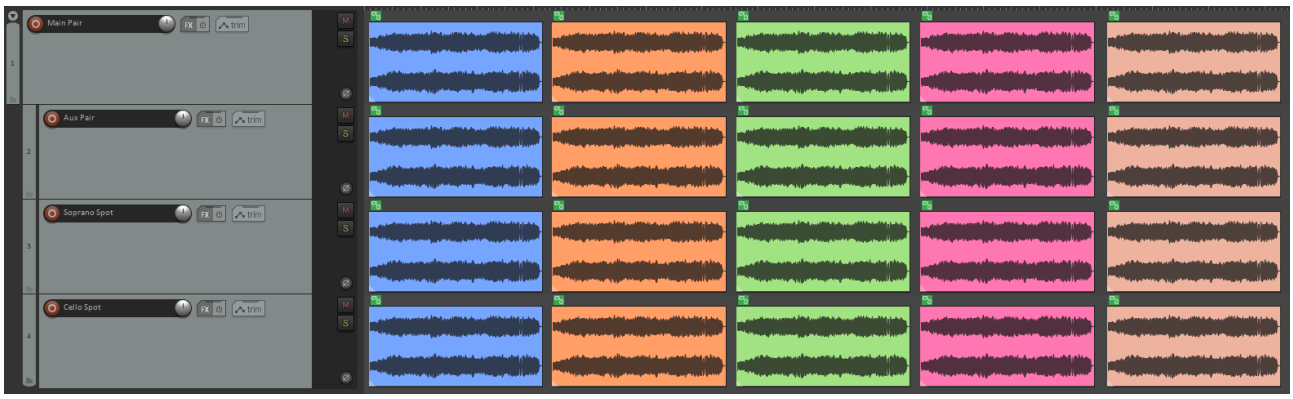


Figure 5: Five takes of a single movement (with tracks comprised of main pair, aux pair, vocal spot and cello spot) given random colours and grouped

source in and out markers, destination in and out markers then press a keyboard shortcut to achieve your 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 script 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 script.

Preparing your recorded takes for classical editing

Whichever method you end up choosing you need to prepare your takes in an appropriate way. I strongly recommend using folder tracks for everything (especially given the vertical workflows rely on the presence of such folders). The folder track itself should hold the first of the audio files which for me is invariably the main microphone pair (stereo). If you recorded mono L & R for your main pair (for example via a portable recorder such as a SoundDevices of Zoom unit), use the Explode multi-channel item function. In situations where you are importing already exploded audio, place all your mono tracks as children leaving the folder track itself empty.

Whether working horizontally or vertically, you can use the *Prepare Takes* script. It is intelligent enough to figure out which workflow you are using. Just press the shortcut (T)[10]. Super simple! Every set of items comprising a take has changed colour, is now grouped, folder tracks are grouped (or re-grouped) for razor editing and imported/recorded take names removed if desired. See figure 5. 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 script 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.

When child tracks are hidden by selecting the folder track and using the D and E shortcuts, this gives the engineer the ability to edit multi-microphone recordings as if they were a simple stereo (or mono) track (see below).

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

Single-window S/D editing (horizontal)

You set your in-out points using special coloured labelled markers I created with shortcuts 1 and 2 (Destination) and 3 and 4 (Source). See figure 8. Simply press the shortcut 5 to make the 3 or 4-point edit.

[10] From now on, you can assume that all shortcuts mentioned are all the ones included in my key map.

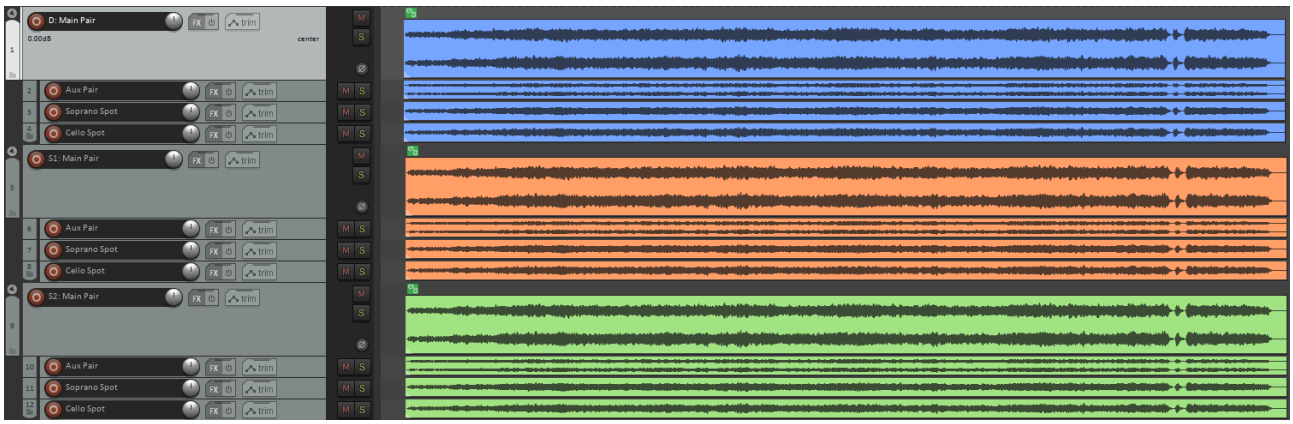


Figure 6: Prepared vertical takes of a single piece after running the *Prepare Takes* script

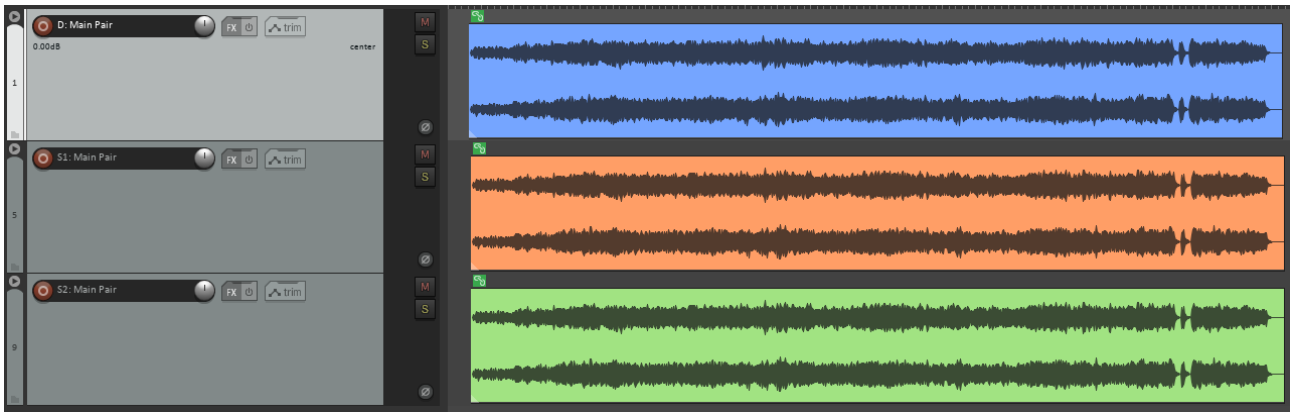


Figure 7: The same project with hidden (super-collapsed) child tracks.

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 scripts 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.

A note on listening to 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 recommended to use the Audition (A) script to quickly solo only the folder (or track) you are interested in hearing. Note that similar to the *Classical Take Record* function, the tracks shown in the mixer are filtered based on what is being auditioned.

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 (1, 2, 3, 4) and the same *ReaClassical_S-D Edit* script (5). Make sure you have the source folder selected as you are creating the source IN and OUT markers. 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.

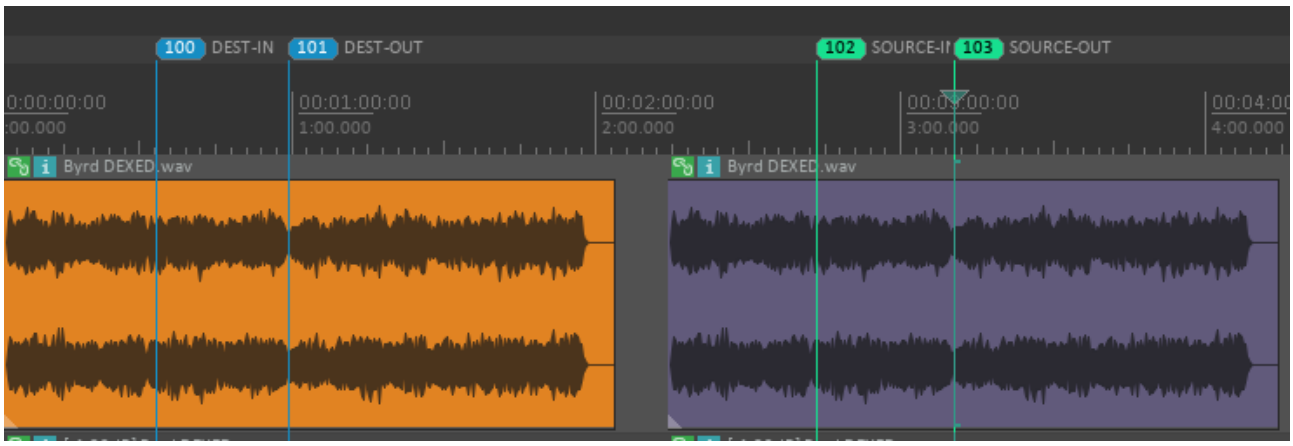


Figure 8: The source and destination markers in action

```
no_meter_reclbl 1
tcp_heights 0 25 50 64   ; supercollapsed, collapsed, small(norecarm), recarm size
tcp_folderindent 0
```

Figure 9: Supercollapsed value should be set to 0 in rtconfig.txt

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

Using Folder tracks and hidden children

Using the shortcuts D (display children) and E (ensconce children) you can work with multi-microphone recordings with ease. See figure 7. Please note that this involves setting tcp_height supercollapsed value to 0 in rtconfig.txt inside the theme zip. See figure 9. For information on how to unpack the theme see https://youtu.be/4MD5IcVGl4I?t=347.

However, for your convenience, I include the default REAPER v6 theme and a few others based on Sequoia, Pyramix and SaDiE colors in my ReaClassical metapackage with this change as well as the mute overlay alpha set to 0.00.

Because the tracks supercollapse state is set to 0 height versus actually hiding them via the track manager, the S/D scripts continue to work as expected (because they rely on selecting the rest of the items in the group). There is also a function to duplicate folders (and their child tracks) for either recording new takes or organizing your editing environment post-recording.

Reminder: In order for this to look visually appealing, please uncheck "Draw faint peaks in folder tracks" under Appearance > Peaks/Waveforms (but, again, this is taken care of in the easy install).

3-point edits (Insert and Replace)

You can complete 3-point editing either using "insert" or "replace" methods with just the destination IN marker set (and both source markers!). "Insert" 3-point edits ripple pastes the source material at the destination IN marker and "Replace" 3-point edits replaces the destination material with the length of the material between the two source markers. As usual, short equal-power crossfades are created at all edit points.

To choose between "insert" or "replace" 3-point edits, toggle the ReaClassical_3-point edit replace.lua script to ON for "replace" and OFF "insert". Even better: use the custom classical toolbar as described above or F3 shortcut.

Insert with Timestretching

Using the *ReaClassical_Insert with timestretching* script (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.

Assembly Line Editing with a 3-point edit

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, use a 3-point edit (most likely you want it set to "insert" mode). A standard 3-point insert edit will happen 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.

Delete With Ripple / Delete Leaving Silence

While perhaps not used as often as 3- and 4-point edits, I have created two scripts 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+Backspace) will also delete but maintain the silence without rippling backwards.

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 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 running the action Swap arrange view… or selecting it under Preferences > Editing Behaviour > Mouse Modifiers > Context: Arrange View (phew!). I set this up as the shortcut I in the portable install and keymaps).

Enhanced razor editing with hidden children (see "Using Folder tracks and hidden children" above)

For a perfect classical razor editing experience, v22.12.4+ uses REAPER's native media/razor track grouping feature (requires REAPER v6.72+).

NOTE: As of REAPER v6.57, you can maintain the ripple-per-track mode and set the mouse modifier for moving razor areas to "move areas, disabling ripple edit". Hopefully you set this up already as part of the "Things to do after installing" section. See figure 11. This way your existing edits ahead of the razor drag will be unaffected by any lateral movement. Again, this is pre-configured in the recommended portable install.

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. See figure 10.

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.

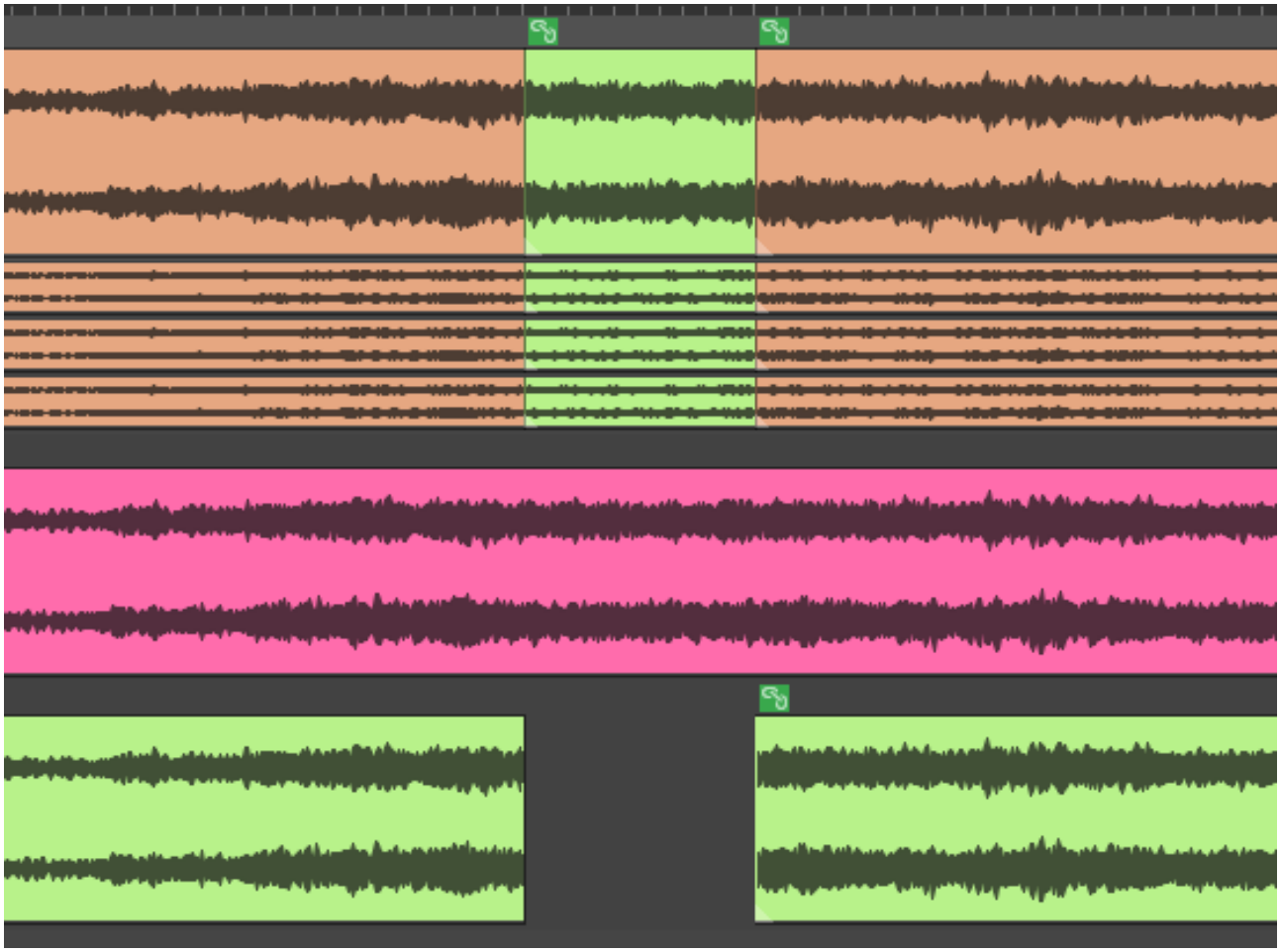


Figure 10: Razor editing with vertically aligned takes using "hidden" child tracks in the sources

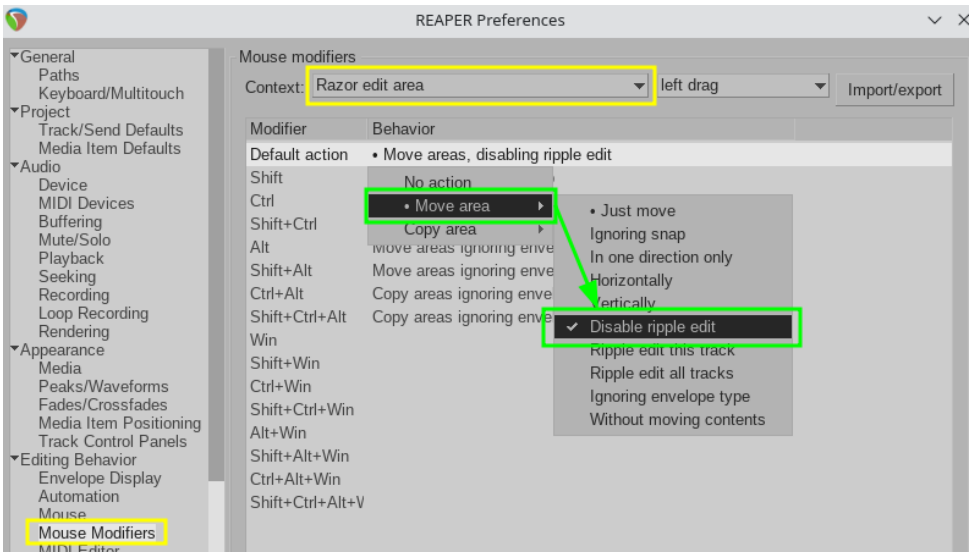


Figure 11: Mouse modifier for “Move areas, disabling ripple edit”

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[11]. The ability to visually align transients and then position the crossfade just before it is absolutely critical (and fun when you have the tools to do it!). So, beyond the standard REAPER crossfade editor what have I provided? Select the left-hand item of a fade, Press F and you are moved into crossfade editor mode. Here, the first track is given full vertical zoom, the two-lanes for overlapping items is enabled, colored red and green, and the fade editor toolbox appears (I personally position it to hover over the middle of my mixer. Note also that you are automatically centred on the crossfade and can use the mouse wheel to zoom in and out. Press F again and you exit that mode. If for some reason you accidentally close just the fade toolbox, either open again using action in the action list or, better still, simply close and re-open the fade editor using the F shortcut.

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). See figure 12. 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 in blank area and pressing Z shortcut)
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.

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).

Auditioning Crossfades

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

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

[11] 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.

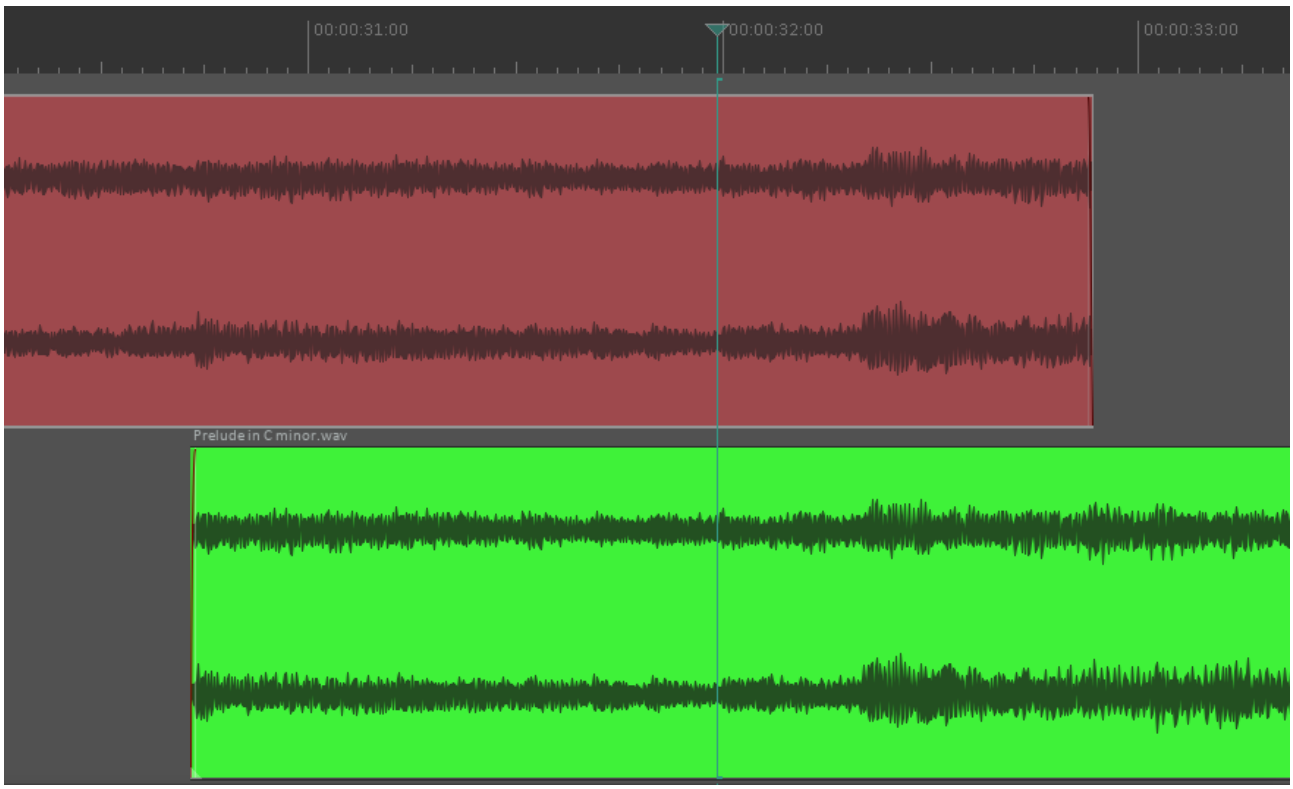
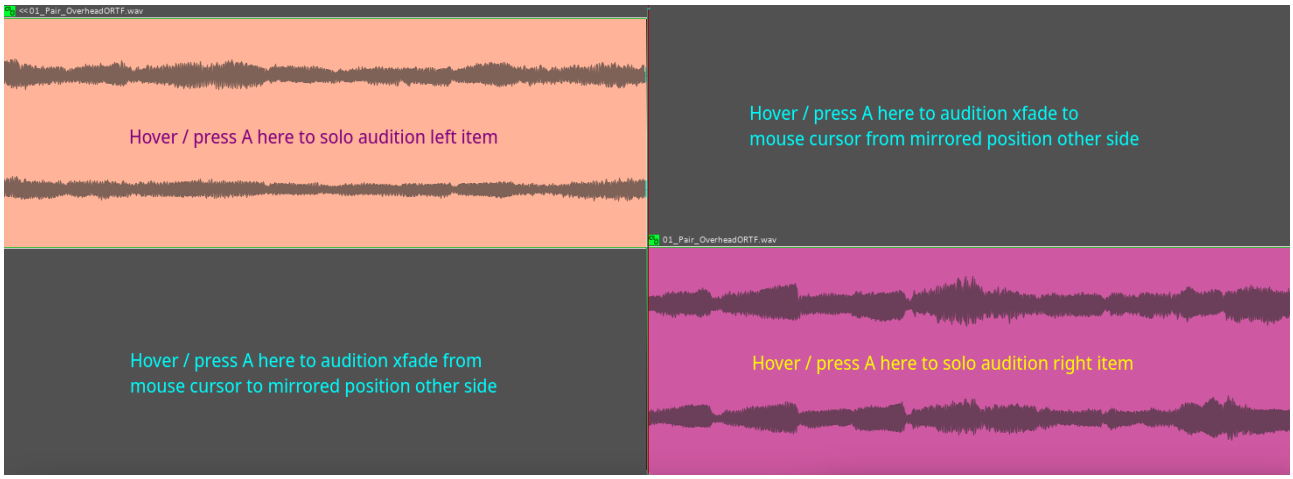


Figure 12: Part of the crossfade window showing two overlapping items, transients aligned, with the edit cursor at the desired crossfade location just before pressing X shortcut

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 script 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.

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 (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 (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. See Appendix C on page 21.

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* script (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 script deprecated given I strongly feel that the Create CD Markers script is now the ultimate way to deal with CD tracks/markers.

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. I have introduced a workflow to automatically add the CD/DDP markers and regions via Y shortcut (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. Preferences such as CD marker offset, pregap and album lead-out can be set via ReaClassical Project Preferences (F5). So it’s now very quick to export a DDP set, a hi-res WAV/CUE via the *Markers to CUE* script (shortcut C) (included in the ReaClassical resource folders, no need to use a time selection) or 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). 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[12]. 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 via my airwindows JSFX ports repository.

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[13] 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.

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 created CD markers at this point as I include a very powerful tool to make light work of that side of mastering.

[12] 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.

[13] 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.

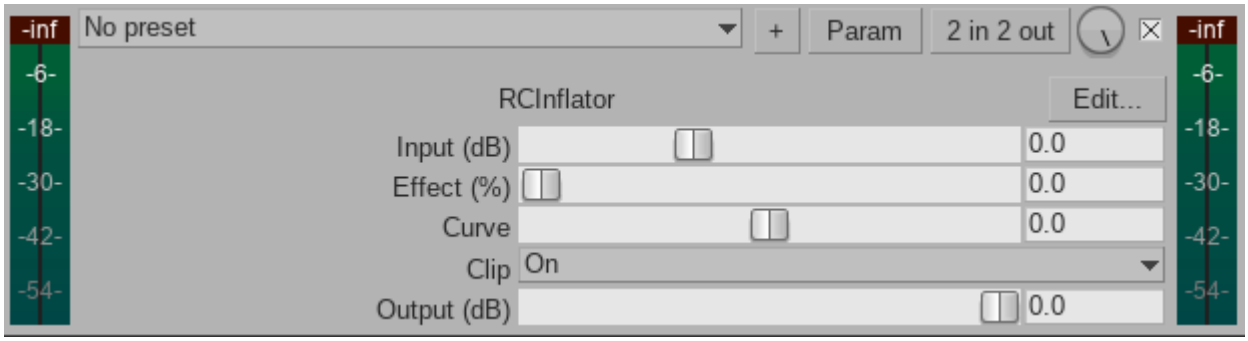


Figure 13: RCInflator in all its generic JSFX glory

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.

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.

Under prerequisites, I included the optional RCInflator[14] (See figure 13) which is a clone of the Sonnox Inflator that I had a hand in bringing into this world with its current capabilities of being able to null test, almost perfectly, against the Sonnox version[15]. 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. More recently, I have introduced many jsfx effects (over 50!) that are 'mastering grade' quality which are again available in my airwindows JSFX ports repository by searching for 'chmaha'. For classical use, I suggest starting with the 'RC' plugins (you can search for 'RCPlugs' in ReaPack) for all your EQ, compression, limiting, deessing and dither needs. Also try any of the console metapackages (with included project templates) for an analog or digital console sound in combination with MagicFairyDust or ELSA saturation which in my own mastering have taken over duties from RCInflator on the final 2-bus. Please see Appendix C for more details about the jsfx.

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 scripts, 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. I'm very happy to hear about potential improvements/additions.

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.

[14] 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.

[15] To the tune of differences down at -144dB or something similar.

Appendix A

Descriptions of ReaClassical Scripts (in a quasi-workflow order)

Preliminary Note: 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.

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 script automatically sets up the tracks for group media and razor-editing.

Create Source Groups (vertical) (F8)

Description: A multi-use script 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 script 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 (A) script 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 script 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* script (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 script 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 script 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 script again until you are happy! The script 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 script will no longer offer to group or colour items due to potentially unexpected editing behaviour. The script 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 script 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 script 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 script collapses them. If fewer than two folders, the script 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* script 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 destination IN and both source 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 shortcut 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 (3- and 4-point editing)

Notes: Once you have placed your S-D markers (either all 4 or just destination IN and both source markers) press shortcut 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. When using 3 markers, the destination IN marker is retained and moved to the end of the edit so you can do assembly-style editing with ease (with 3-point mode set to *Insert*). 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. Crossfade length is set via ReaClassical Project Preferences (F5).

3-point insert/replace (F3)

Description: Toggle between *insert* and *replace* modes for 3-point editing.

Notes: When using a destination IN marker and both source markers the material between the source markers is either inserted (rippling all material to the right of the edit point) or replaced (no rippling). To make any source-destination edit (3- or 4-point) use shortcut 5.

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 (Backspace)

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 + Backspace)

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 1-4 replace any existing version of the marker. Also when running *Create CD Markers* script 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 script 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 script 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 script 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+left/right)

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.

Notes: This might be the biggest time-saving script 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 script 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 script 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 script 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 script 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 script will always place the marker on the earlier of the two. By default, the script 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 script 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 script*, it is now extremely easy to generate a CUE file 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. Any data entered is stored and recalled the next time you use the script. Before or after using the script, 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 script is now deprecated but I will leave in place for now. It was useful before the new *Create CD Markers* script 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 script. The lock toggle icon on the custom toolbar has now been replaced by a mug to represent the *Create CD Markers* action.

Appendix B

ReaClassical Keyboard Shortcuts

Navigation

Home	Project Start
End	Project End
‘	Whole Project View (Horizontal)
Ctrl+‘	Whole Project View (Vertical)
Ctrl+Up	Increase peaks display zoom for project
Ctrl+Down	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
TAB	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
Ctrl+up	Increase waveform display
Ctrl+down	Decrease waveform display
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)
K	Lock Toggle
V	Toggle per-track ripple editing

S-D Editing

1	Add Destination IN marker
2	Add Destination OUT marker (without does 3-point edit)
3	Add Source IN marker
4	Add Source OUT marker
5	Make S/D Edit
ctrl+Del	Delete all S-D Markers
bksp	Delete with ripple (between 2 source markers)
ctrl+bksp	Delete Leaving Silence (between 2 source markers)
F3	3-point Insert/Replace toggle
F4	Insert with time-stretching (All 4 S-D markers)

Mastering

Y	Automatically generate DDP markers from items
Ctrl+Y	Reposition CD tracks
Ctrl+Left	Shift CD track one track to the left
Ctrl+Right	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 from project CD markers
R	Render

Miscellaneous

F5	ReaClassical Preferences (set crossfade length, CD track offset, INDEX0 pre-gap length, Album lead-out time)
H	Open ReaClassical help system (currently the PDF guide)
O	Options (Preferences)
P	Project Settings
B	Batch file converter
Ctrl+U	Check for REAPER updates (using REAPER update utility lua)

Appendix C

Recommended cross-platform free mastering-grade plugins for classical work

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:

- **RCEQ** (ReaClassical EQ, available in ReaPack via my repository). Uses DSP from airwindows 'Baxandall' and Stillwell's RBJ Highpass/Lowpass Filters for 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.

Restoration:

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