

# REAPER Update Summary Guide

## Main changes, versions 6.65 to 6.68

This document has been produced primarily for the benefit of those users who have a printed, hard copy User Guide.

It reproduces in each case sections which are either new or which have changed significantly. Relatively minor tweaks and twiddles are not included here. The "litmus test" that has been applied is whether these changes seem likely to have, or might possibly have, any significant impact on your way of working.

The document is intended to assist you in keeping your documentation up to date.

You can print off those pages which are relevant to you, file them, and make a mark or annotation in your hard copy guide to that effect.

This Update Summary Guide will itself be updated regularly with future new releases.

## Summary of Contents

### Version 6.65

- Changes to track pan dialog
- Changes to track FX basics
- Changes to Media Explorer item previewed
- Changes to FX plugin defaults and FX browser options
- File rendering statistics

### Version 6.66

- Video and Media Import preferences.

### Version 6.67

- Region/Marker Manager – new features
- Region Render Matrix – new features
- New feature – Retroactive MIDI recording
- Performance Meter – improvements

### Version 6.68

- Adjusting media item fades
- Smart tools and armed actions



# **REAPER User Guide**

## **Main changes, version 6.65**

August 2022

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Changes to track pan dialog

## **Pan Law and Pan Mode**

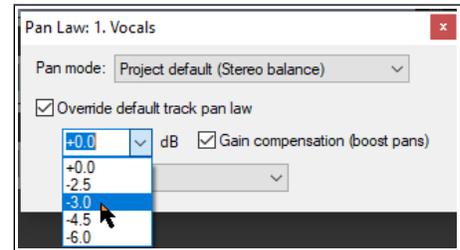
When two channels are mixed the result is louder if both are panned dead center than if they are each panned to the extreme left and right. Pan laws enable you to compensate for this. You can choose a default pan law for new tracks in your advanced **project settings**.

Right-click on the pan control to choose a **pan mode** (see right). Pan modes are explained more fully in Chapter 11 when we look at stereo panning. In brief, however, you have a number of options – **Stereo balance/mono pan** is the default (see Project Settings). This is equivalent to the mode used in versions before REAPER 4. Some of the screen shots used in this guide show dual pan controls.

You can change the **pan law** for individual tracks. Right-clicking over a track's pan fader opens a window with an option to **Override default track pan law**. Selecting from the list (in a range 0.0 dB to -6.0 db) or type in your own value. A negative setting causes the signal at the center to be attenuated as panning increases.

The **Gain compensation (boost pans)** option can be enabled to cause the signal's audio strength to be boosted as it is panned further away from the center. The -3 dB and -6 dB settings correspond exactly to equal power and equal gain respectively.

The last dropdown presents three options – sine taper, linear taper and hybrid taper. In short, with linear taper the overall sound increases as you pan towards the center. Non-linear tapers seek to compensate for this. You'll find more technical information about pan laws here: <https://samplecraze.com/tutorials/the-pan-law/>



Individual FX context menus include options to Add with preset, Rename FX, Create keyboard shortcut and Set default preset.

## Track FX Basics

FX can be used with REAPER, for purposes such as EQ, compression, chorus, reverb and more. Track FX (JS, VST, VST3 and DX, VSTi, VST3i and DXi, and, for Mac users, AU) can be added to tracks and media items from the FX browser or by directly inserting them into the track or item FX Chain. Media item FX are explained in [Chapter 6](#). Many FX plug-ins are supplied with REAPER, including Jesuonic and Cockos effects.

We'll examine many of these later in this User Guide, especially in [Chapters 6](#) and [16](#). For now, let's just focus on some general aspects of how audio FX fit in to the REAPER scheme of things. To access any of these FX, simply follow these procedures:

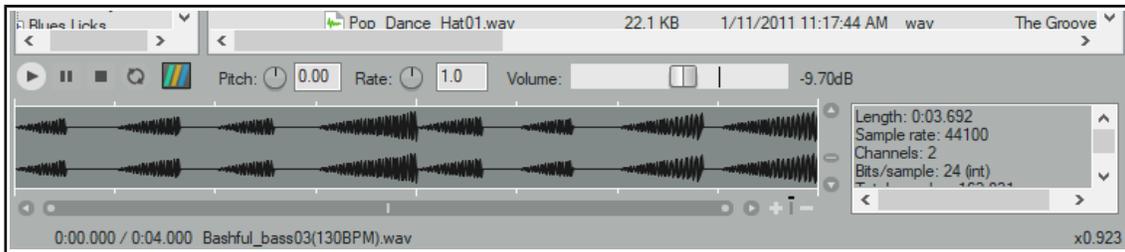
FX can be added to any track or item FX directly from the main FX Browser window. Each track and item also has its own FX window: these are most suitable for managing the individual FX parameters and the FX chain itself, although FX can also be added to individual track and item FX from within this window.

From the FX browser...	You can do this ...
<b>Open the FX Browser</b>	Choose <b>View, FX Browser</b> command or press <b>Shift F</b> .
<b>Add FX to a track or item</b>	Drag and drop FX from FX Browser to track panel or mixer panel or item.
<b>Add FX with preset</b>	Right click on FX name, choose <b>Add with preset</b> from menu.
<b>Add several FX to a track or item</b>	Use <b>Ctrl left click</b> to build selection. Drag and drop selection from FX Browser window to track panel or mixer panel or item.
<b>Add one or more FX to a number of tracks or items</b>	Select the tracks (track panel) or items (arrange view). Select the FX. Right click over any selected FX, choose <b>Add to selected tracks</b> or <b>Add to active takes of selected items</b> .
<b>Rename the FX</b>	Right click on FX name, choose <b>Rename FX...</b> from menu.
<b>Create keyboard shortcut</b>	Right click on FX name, choose <b>Create shortcut ...</b> from menu. This shortcut can now be used to insert that FX into any track or media item.
<b>Set default preset for FX</b>	Right-click on FX name, choose <b>Set default preset</b> and select a preset from the list.
<b>Insert previously saved FX chain in a track or item.</b>	In FX Browser, select <b>Chains</b> in left hand panel. Drag and drop required chain to track panel or mixer panel or item.
<b>Create new track and add FX</b>	Drag FX from FX browser window to empty area of track panel.
<b>Dock FX Browser</b>	Right click on title bar, choose <b>Dock FX browser in docker</b> To undock, right-click on browser tab and deselect <b>Dock FX browser in docker</b> .
<b>Advanced technical default options</b>	More advanced technical options are documented in the section <b>Advanced plug-in defaults</b> .
From a track FX window...	You can do this ...
<b>Open a track's FX window</b>	Click on track's <b>FX</b> button. If no FX chain already exists for this track, click on <b>Add</b> button.
<b>Add FX to track FX chain</b>	Double-click on the required FX in FX browser window.
<b>Add several FX</b>	Use <b>Ctrl click</b> to build selection, then click on FX browser <b>Add</b> button.
<b>Set FX to bypass (toggle)</b>	In the FX chain, click on the FX name, press <b>Ctrl B</b> .
<b>Set FX to offline (toggle)</b>	In the FX chain, click on the FX name, press <b>Ctrl Alt B</b> . Unlike bypassed FX, offline FX will consume no CPU.

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**Section 4.6**

You can now make changes to pitch, rate and/or volume either by using the rotary/fader controls or by typing.

**Media Item Preview**



Usually you will want to audition items before inserting them into a project. The media explorer allows you to do this. The Auto play option (on the toolbar) can be used to ensure that by default an item is automatically played when you select it. You also have a number of options available which determine exactly how the preview feature will behave. Also, as you will see in the section that follows this one, you have a great number of options for determining just how items are inserted into your project.

Use the **Media Information** tool (second on toolbar) to toggle display of the media information box. Also, identify the main playback controls. The **Transport Bar** buttons (L to R) are Play, Pause, Stop and Toggle Repeat. The horizontal fader (far right) adjusts the volume of playback. Now make yourself familiar with the following features:

In order to do this ...	Do this ....
<b>Select a file to audition</b>	Recommended: make sure <b>Always show waveform peaks for selected media</b> on the <b>Options</b> menu is enabled. Click on file in media explorer main panel, or use the keyboard up/down arrow keys on your to move thru the list.
<b>Preview an .RPP file</b>	Ensure <b>Preview REAPER.RPP projects</b> in <b>Options</b> menu is enabled. Select .RPP file within media explorer. You can also enable <b>Do not auto-render .RPP proxy</b> .
<b>Show preview position in fractions of seconds</b>	Enable <b>Display preview position in fractional seconds</b> in <b>Options</b> menu.
<b>Audition a file: play and stop</b>	Select file in media explorer's main panel. To start, click on the <b>Play</b> button in the preview panel, or press the right arrow key or spacebar on your computer keyboard. To stop, click on the <b>Stop</b> button in the preview panel, or press the left arrow key or spacebar.
<b>Play item as a continuous loop</b>	Enable the toggle repeat button on the preview toolbar.
<b>Preview with start on bar enabled</b>	Enable <b>Start on bar</b> (on toolbar). Optionally, enable <b>When start on bar enabled, wait for next bar to start preview</b> (Options menu)
<b>Audition only a portion of a file</b>	Make time selection (as shown here ) then use spacebar to start/stop. Drag and drop from either the start or end of selection to extend/shorten it. <div data-bbox="901 1654 1464 1759" data-label="Image"> </div>
<b>Zoom in/out of waveform</b>	Scroll mousewheel up/down.
<b>Scroll zoomed waveform</b>	Shift drag left/right.
<b>Adjust height of peaks display</b>	Hover mouse over top of display area to show mouse cursor as a double-headed arrow. Drag up or down.

In order to do this ...	Do this ....
<b>Play all files in sequence</b> (needs repeat to be off)	Select <b>Auto advance to next file after preview</b> from the <b>Options</b> menu. Press <b>Spacebar</b> .
<b>Automatically audition file when selected</b>	Enable the <b>Auto play</b> tick box.
<b>Synchronize to current project</b>	Enabling <b>Start on bar</b> will ensure that in auditioning the item during project playback, the item playback will be co-ordinated so as to start on a bar.
<b>Audition item within current project</b>	Click on the <b>Routing</b> button and enable <b>Play thru ... selected track</b> . Insert a new track into your project and keep it selected. If you wish, enable both <b>Repeat toggle</b> and <b>Start on bar</b> . When started, playback will be thru the selected track – you can experiment with volume, panning, track FX, etc. When you also play the project, you will hear the item played with the project.
<b>Use crossfades (optional)</b>	The <b>Options</b> menu has an option to <b>Crossfade when switching between items</b> . The <b>Configure crossfade</b> option lets you set crossfade length,
<b>Tempo match</b> (use toolbar to toggle and choose options)	With this on, the tempo of the selected item is matched to that of the project. Other options include <b>Tempo match half</b> and <b>Tempo match double</b> .
<b>Modify volume</b>	Use <b>Options</b> menu to <b>Apply preview volume to inserted media</b> .
<b>Pitch/Rate rotaries and Volume fader</b>	Use these to make adjustments while auditioning, or type values in edit boxes next to the controls. The <b>Detect pitch</b> toolbar button displays the pitch in the preview window when auditioning. Enable <b>Options, Apply preview pitch rate to inserted media items</b> to apply pitch when inserting a media item.
<b>Pitch and rate options</b>	Right click on either the pitch or the rate control knob for a context menu of options, also available from the Media Explorer Options menu: <b>Preserve pitch when tempo-matching or changing play-rate</b> (toggle) <b>Reset pitch and rate when changing media</b> (toggle) <b>Pitch shift knob behavior</b> (options are <b>Continuous, Cents, Quarter tones, Semitones</b> ) <b>Pitch shift knob range</b> (options are +/- 2, 6 or 12 semitones).
<b>Normalized volume options</b>	The <b>Options</b> menu includes <b>Normalize preview volume</b> [to -0 dB or -12 LU] <b>if peak volume has been calculated</b> , and <b>Apply normalized volume to inserted media items</b> . See also <a href="#">Media Explorer Actions</a> .

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### Sections 6.8, 6.9

Within the FX browser you can define default global settings for individual FX, including Run as, Compatibility, Keyboard input and Oversampling.

Floated individual FX windows have options to embed UI, access keyboard shortcuts, and for oversampling

### Advanced Plug-in Defaults

There are a number of options available in the Add FX browser which you can use to define default settings for individual plug-ins. These will automatically be applied to that plug-in instance whenever it is added to a track or media item. Most of these deal with advanced technical matters: if you a relative newcomer to digital audio, you might wish to skip over this section.

You can access these by right-clicking over any plug-in name in the FX browser list.

Right-click on any FX in the FX browser for a menu of options. Most of these are explained in the section [Track FX Basics](#). In addition, the following options allow you to set individual plug-in defaults.

Menu Item	Submenu options
<b>Run as</b>	The default setting is <b>Automatic</b> , but you can change this to any of <b>Separate process</b> , <b>Dedicated process</b> , <b>Native only</b> (prevent bridging). There is also an option to <b>Embed the bridged UI</b> . For more information, see <a href="#">Bridging and VST Plug-in Run Mode</a> .
<b>Compatibility settings</b>	This is especially useful for plug-ins that might have known or suspected compatibility issues. You can enable or Options available are <b>Save minimal undo state</b> , <b>Avoid loading undo states where possible</b> , <b>Inform plug-in when track channel count changes</b> , <b>Hard reset on playback start</b> , <b>Hard reset on playback start</b> , <b>Save state as VST bank</b> , <b>Buggy plug-in compatibility mode</b> , <b>HiDPI compatibility mode when floating windows</b> . There is also a further sub-menu to manage <b>Automation notifications</b> . Options are <b>Defaults</b> (set in preferences), <b>Ignore when plug-in window not open</b> , <b>Ignore when not from UI thread</b> , <b>Ignore all notifications</b> , <b>Process all notifications</b> . For more information about some of these options, see the section <a href="#">VST and VST3 FX Compatibility Settings</a> .
<b>Default settings for new instances</b>	Any of these options can be enabled if you wish them to be automatically applied whenever the particular FX is added to a track or item: <b>Send all keyboard input to plug-in</b> , <b>Show embedded UI in TCP</b> or <b>MCP</b> (if supported), as well as a sub-menu of options for <b>FX instance oversampling</b> . Options are <b>Up to 88.2k/96k</b> , <b>Up to 176.4k/192k</b> , <b>352.8k/384k</b> , or <b>Up to 705.6k/768k</b> . The section <a href="#">FX Chain Settings and Preferences</a> explains oversampling.

### Advanced Floated FX Window Options

The essentials of floating individual FX windows have been covered in Chapter 2: see [Controlling Track FX](#). In addition, a number of more advanced options are available from a context menu (right-click on the title bar).

Menu Item	Submenu options
<b>Embed UI in TCP or MCP</b>	Where appropriate, these options will be enabled. See the section <a href="#">Embedding FX GUI in TCP or MCP</a> .
<b>Send all keyboard input to plug-in</b>	Enabling this will ensure that keystrokes such as up and down arrows will be applied within the FX window rather than in the arrange view.
<b>Chain/FX instance oversampling</b>	This allows oversampling to be applied just to the individual FX instance, or to the track or item FX chain. Options are the same as in the table immediately above this one.

Render stats: various improvements including option to open rendered file in media explorer.

### Rendering a Project

#### Sample output from dry run render

Information (including % complete) is displayed in real time while rendering.

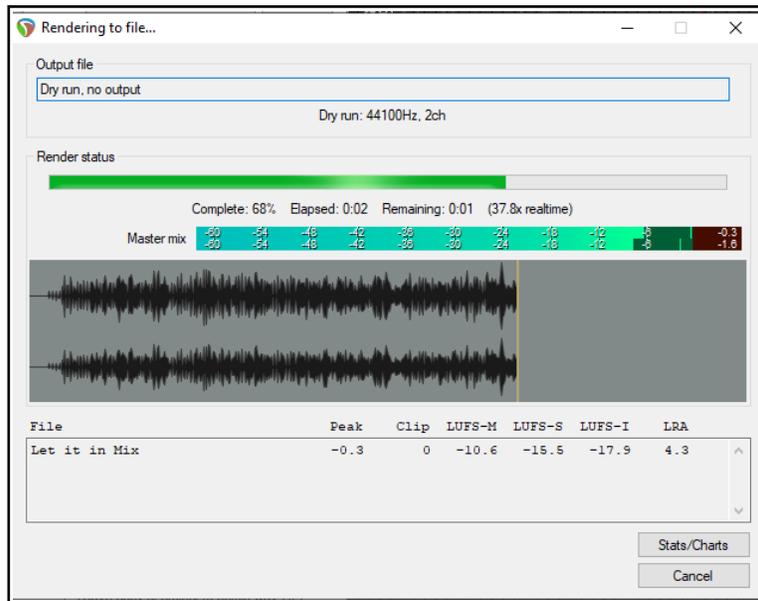
Whether dry rendering or rendering to a file, click on the **Stats/Charts** button to:

- Calculate and display True Peak, LUIFS-I, LUIFS-M, LRA, LUFS-S and/or RMS-1.
- Jump to the first clip position in project.
- Jump to loudest sample.
- Display render statistics information

This button also includes options to **Open statistics charts in web browser**, (with or without **hide file paths**) and to **Jump to the loudest sample position in project**.

This display will include a detailed graph of render statistics, including loudness values. This is the case after both a dry run and an actual rendering.

When you are **rendering to a file**, the information displayed in this window is similar. In addition, there are options to **Close the render window** or **Return to render setup**. Three additional buttons are displayed, to **Launch the file**, **Open the folder**, or to open and display the file in the **Media Explorer**.



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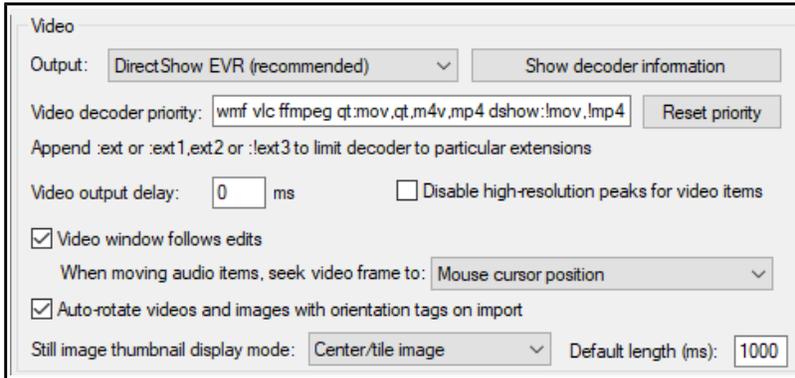
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These sections are best understood when considered together. Only change is that Video Preferences and Media Import Preferences have been separated.

## Video Preferences

**Output** options are shown below that.

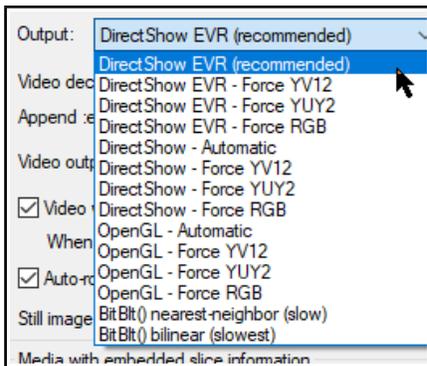


There is an option to open a window within Preferences to **Show decoder** information. You can, if you wish, edit the **Video decoder priority list** to change the order in which priority is allocated. By default, VLC format is assigned the highest priority.

The option to specify **Video output delay** can be used if necessary to improve playback synchronization. This can be a small positive or negative amount. There is also an option to **disable high-resolution**

**peaks**. Enabling the option **Video window follows edits** ensures that the video window will synch to the seek point when audio items are moved or resized.

**Still image thumbnails** can be hidden or displayed in center/tile mode, full height mode or stretch/image mode. You can also specify the **default length** for thumbnail images.



You can further choose your preferred behavior when audio items are moved, so that the video window displays content at the mouse cursor position, the start of the audio item, or a snap offset of the audio item.

Note also an option to **Auto-rotate videos and images with orientation tags on import**.

The **Video file item properties** dialog (accessed by choosing **Source properties** from the item context menu) includes options to **Ignore audio** and for handling **Hi-res peaks**. There is also an option to **Copy audio settings to all video sources**.

In addition, the **File, Render** command can be used to export video from REAPER - see Chapter 21.

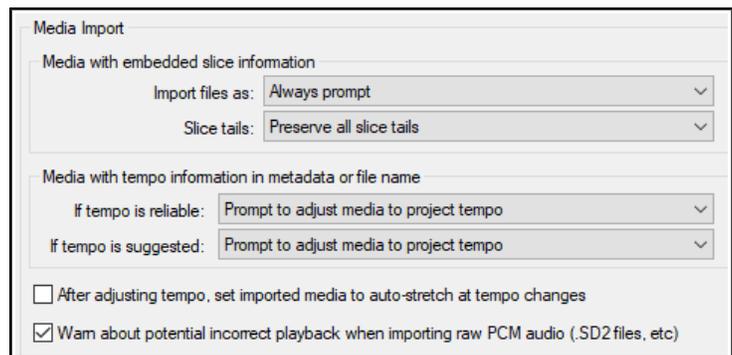
Note also that the **Performance meter** includes an option to **Display video load**.

## Media Import Preferences

For **Video** preferences see Chapter 20.

The **Media Import** options include how you wish to deal with **embedded slice information**, in particular how to **import files** and how to handle **slice tails**.

**Options for importing media with tempo information in metadata or file name** are determined by whether or not the tempo is reliable or suggested. There are options **After adjusting tempo, set imported media to auto-stretch at tempo changes** and to **Warn about potential playback when importing raw PCM audio**.





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## Pages 162-163, 396-398

### Sections 9.9, 21.7

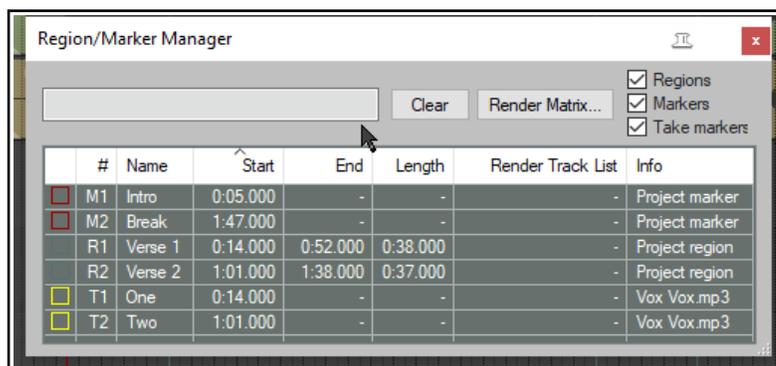
These sections are best understood when considered together. Enhancements include being able to select (within the Region/Marker Manager) individual tracks or any required number of tracks to be rendered within a region and being able to specify a required number of channels when rendering regions.

## The Region/Marker Manager

The **View, Region/Marker Manager** command toggles this display, used to manage regions and markers (including **take markers**).

The region/marker manager organises markers and regions using its buttons, its controls, and its context menu (displayed by right-clicking on its title bar or in its background area.) This includes options that can later be used within the **Region Render Matrix** for rendering.

For additional options for the display of region names and numbers on the ruler, see **Ruler Layout Options**.



To do this ...	... you do this
<b>Select which region/marker types to display</b>	Use check boxes in top right corner of R/M Manager window.
<b>Choose which columns to show/hide</b>	Right click on any column header, select from list.
<b>Sort rows by any column header</b>	Click on column header, twice to reverse sort order.
<b>Change column order</b>	Drag header(s) left or right.
<b>Edit marker/region name</b>	Double click on name.
<b>Zoom to region in arrange view</b>	Double click region number.
<b>Go to marker in arrange view</b>	Double-click marker number.
<b>Select several markers/regions</b>	Click on first name, then Ctrl click on others to build selection.
<b>Delete markers/regions (but not the media items within them)</b>	Make selection, press <b>Delete</b> .
<b>Change region/marker color</b>	Click in small color box in first column, use color picker.
<b>Change marker name</b>	Double click on marker name, enter new name.
<b>Change marker/region start/end time or length</b>	Double click on current value, enter new value.
<b>Filter marker region list using filter box above the table.</b> See also <b>Using Search Filters</b>	Type text string– e.g. <i>verse</i> to list only markers/regions containing that text string. Supports boolean search, e.g. <i>lead</i> OR <i>break</i> finds names including either of those strings.
<b>Find marker/region in manager from the ruler</b>	Right-click on marker/region name on ruler, choose <b>Select in Region/Marker Manager</b> .
<b>Specify tracks to be included when region is rendered</b>	Build selection of tracks in arrange view, then select region, click in <b>Render Track List</b> cell, and choose <b>Render only selected tracks</b> , or click in the region's <b>Render Track List</b> cell and select tracks from menu list, or <b>All Tracks</b> .
<b>Add tracks to region render list</b>	Select from the region's <b>Render Track List</b> dropdown.
<b>Renumber markers, regions in timeline order</b>	Select command from the Region/Marker Manager context (right click) menu.
<b>List markers and regions separately</b>	Enable this option from the manager's drop down menu.

To do this ...	... you do this
<b>Import regions/markers from .CSV or .TXT file</b>	Choose either to merge or import from context menu.
<b>Add/remove child tracks to render list with parent</b>	Enable this option in the context menu.
<b>Export regions/markers to file</b>	Choose this command from context menu.
<b>Dock R/M Manager in the docker</b>	Choose this command from the context menu.
<b>Seek playback when selecting marker or region</b>	Enable this option in context menu.
<b>Automatically play region thru then repeat or stop when selecting a region</b>	Enable this option in context menu.

## Pages 162-163, 396-398

### Sections 9.9, 21.7

These sections are best understood when considered together. Enhancements include being able to select (within the Region/Marker Manager) individual tracks or any required number of tracks to be rendered within a region and being able to specify a required number of channels when rendering regions.

## Rendering Regions

*This section requires you to have a sound knowledge of REAPER's regions. - see Chapter 9.*

Defining your region rendering requirements can use a combination of three possible windows: **Render to File**, **Region/Marker Manager** and **Region Render Matrix**. For the most part you will not need to use all three together, but it will help you if you understand how these three windows can work together.

Of course, there are many reasons why you might wish to use and work with regions without rendering them as regions. However, there are other circumstances when you might wish to do this. After making your choices in the **Render Track List** column of the Region Render Matrix you could go to the **Render to File** dialog if you wish, selecting **Region render matrix** or **Region render matrix via master** as appropriate, with bounds set to **All project regions**.

However, there can be advantages in taking your **Render Track List** specifications (for example which regions to render and which tracks to include) into the **Region Render Matrix** where those choices will automatically be reflected, as in the example shown here.

### The **Region Render**

**Matrix**, presents you with a number of further options as well as offering a direct route to the **Render to File** dialog. You can access this directly from arrange view, without needing first to visit the Region/Marker manager. Thus, it can be accessed in any of three ways:

- From the main menu choose **File** then **Region Render Matrix**, or
- Click on the **Render Matrix...** button in the Region/Marker Manager window.
- In the **Render to File** dialog (**File, Render...**), select **Region render matrix** from the Render drop down list, then click on the **Region Matrix...** button (see below right).

To understand how this matrix works, look at the example below right. It uses a simple project of five tracks (including a folder). The song includes three regions – Verse 1, Verse 2 and Verse 3 .

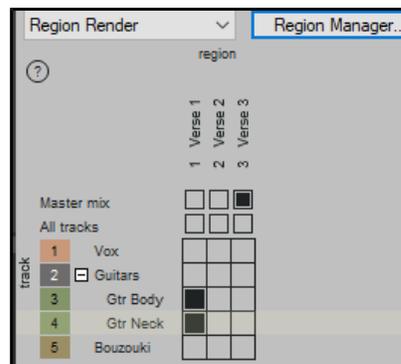
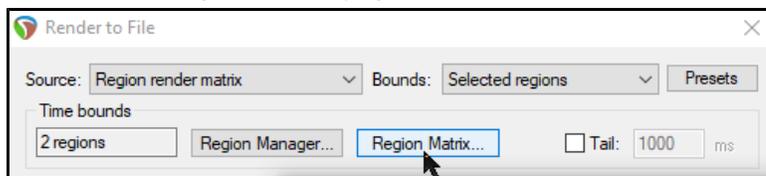
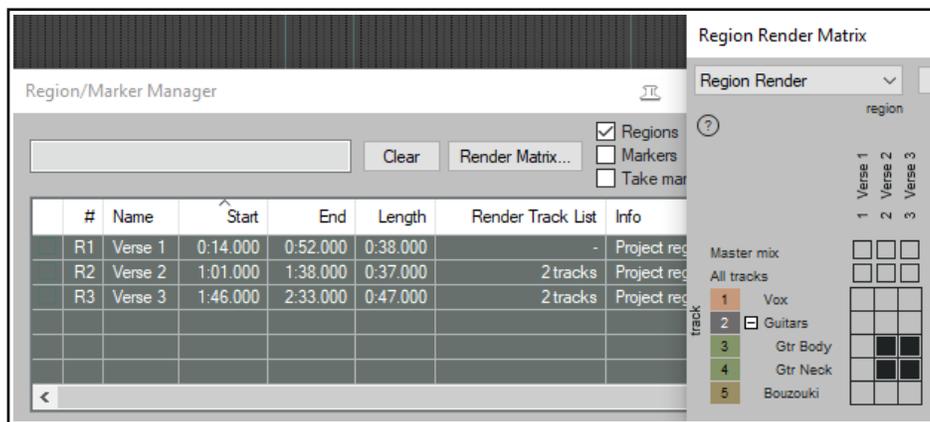
In the first column (Verse 1), the two guitar tracks (tracks 3 and 4) are checked. This would result in two files, one for each of these tracks, being rendered for Verse 1.

If we had checked All tracks, a separate file would have been rendered for each track, including the folder – five tracks in all.

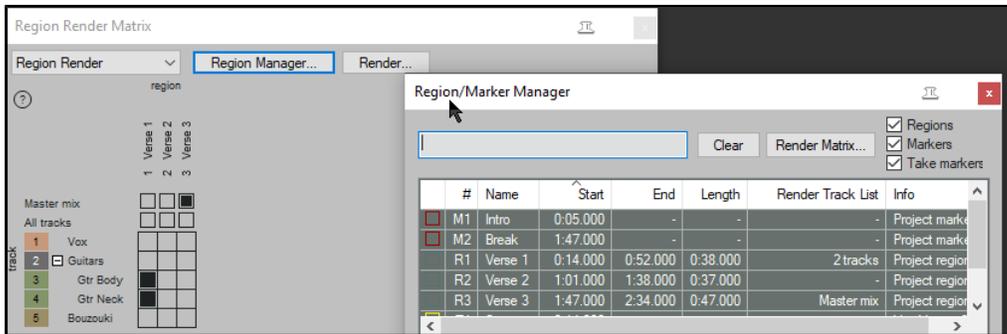
In the second column (Verse 2) nothing has been checked: this verse will therefore not be rendered at all.

In the third column, Master mix has been checked. This would result in one file being rendered for Verse 3 – a master mix of all tracks, with no individual files for any of the tracks.

Within the Region Render Matrix, you can also click on the ? symbol (top left corner) to open a Help screen with more information.



Remember, you can make your selection in either the Region Render Matrix or the Region/Marker Manager – the other one will be automatically updated, as shown here:



The Region Render Matrix right-click menu offers some useful shortcuts for selecting what is to be rendered and other options. This saves you having to keep clicking within the matrix to make your selections.

**Render this track for this region** simply does what it says.

**Render this region** will render all tracks in this region to a single file.

**Render this track** will render all regions for this track to a single file.

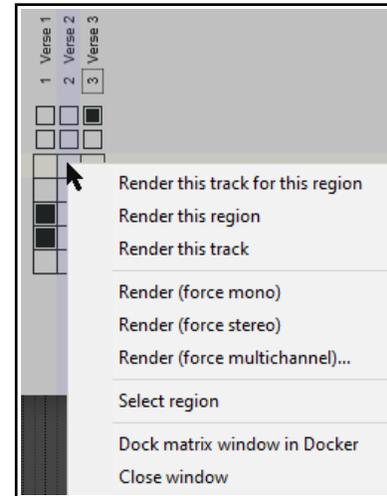
**Render force mono/stereo/multichannel** will render in the selected format (mono, stereo or multichannel) whichever choice you make from

**This track for this region, This region, or This track.** For multichannel rendering you will need to specify the number of channels.

**Select region** simply selects the region.

You can choose to **Dock** or **Undock** the matrix window in the docker.

When you have made your choices, clicking the **Render...** button will open the **Render to File** dialog, then select **Region render matrix** and **All regions**.



Output format, etc. are specified in the usual way. Use a backslash in the file name wherever you wish to create subdirectories. If you choose, for example, as your file name **\$project\\$region-\$track** then the output files produced will include the project file name, region name and track name, with each region's files being placed in its own separate sub-directory. The file name **\$project\$track-\$region** would include project name, track name and region name, with this time a separate subdirectory for each track.

When ready, choose **Render xx files...** or **Queued Renders...** to proceed.

This is a new feature. It enables you to practice your MIDI keyboard skills to your heart's content ... then when you wish you'd recorded that perfect take to retroactively do so!

## **Retroactive MIDI Recording**

REAPER's action list (main section) includes five actions which enable you to record MIDI material retroactively. This enables you to experiment with your keyboard so that if you create a passage that you like you can retroactively record it. These actions (which can be assigned to a toolbar if you wish) are:

**MIDI: Clear retroactive history**

**MIDI: Insert all available retroactively recorded for armed and selected tracks**

**MIDI: Insert all available retroactively recorded for armed tracks**

**MIDI: Insert recent retroactively recorded for armed and selected tracks**

**MIDI: Insert recent retroactively recorded for armed selected tracks**

### **Example**

This example uses REAPER's Virtual MIDI Keyboard, but you could use any installed external MIDI input device.

1. In Arrange view, create a new track and add a virtual instrument (e.g, ReaSynth) to its FX chain.
2. Click on the track's red record arm button to arm it. Right click over the button and enable Monitor input.
3. Right click on the record arm button, select Input MIDI, then your input device (e.g. Virtual MIDI keyboard), then a channel or All Channels.
4. Run the action **MIDI: Clear retroactive history** to clear out any existing history from the buffer.
5. Arm the track but do *not* press the record or play buttons on the transport bar.
6. Make sure that this track is selected and play a few notes on your input device. Stop playing after a few seconds.
7. Run the action **MIDI: Insert recent retroactively recorded for armed and selected tracks**
8. The notes that you have just played will be inserted as a new midi item.

These two sections are closely related. Main improvements are in options for displaying CPU utilization and Real Time CPU meters.

## Analyzing FX Performance

FX plug-ins can impose a heavy load on your computer's CPU. To help you overcome this, you can use the **Performance Meter** to closely monitor your FX in the following ways:

- You can check how much CPU is being used by the FX in your various tracks and in the master.
- You can disable and enable FX chains for individual tracks, quickly, easily and conveniently, all together in one place.
- You can toggle on and off the mute status for your tracks, again all in one convenient place.

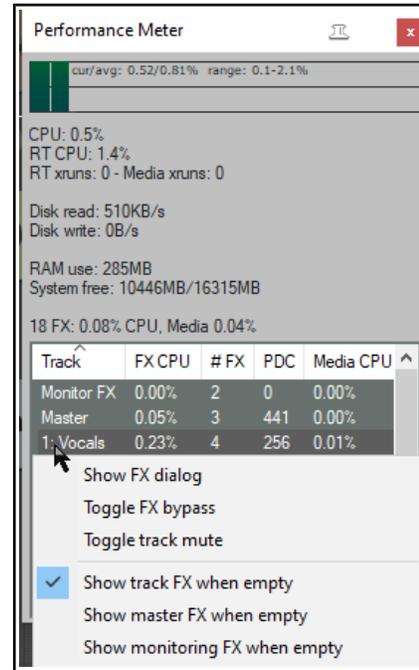
To display the Performance Meter, press **Ctrl Alt P**, or use the **View, Performance Meter** command.

### Example

In the example shown (right), the Master track with 3 plug-ins is using 0.05% and the Vocals, with four plug-ins, is using 0.23%. Media items on this track are using a further 0.01%.

If any track shows an unexpectedly high reading examine the track FX f to help identify the reason for this. To open a track FX chain, double click on the track name or number in the Performance Meter window.

This feature is useful if a project has many tracks. You can use the Performance Meter window to browse your project file, checking it track by track, without having to scroll or navigate thru Track View. You can also toggle FX Bypass for any track, selection of tracks, or all tracks in the **Track View** or **Mixer View**. The table below summarises these options.



In order to do this ...	In Mixer or Track View, do this ...
<b>Toggle FX Bypass On/Off for that track.</b>	Click the <b>FX Bypass</b> button for any track.
<b>Toggle FX Bypass On/Off for all tracks in the selection.</b>	Select a number of tracks ( <b>Ctrl Click</b> ) then click the <b>FX Bypass</b> button for any track in the selection.
<b>Toggle FX Bypass On/Off for all tracks.</b>	Hold <b>Ctrl</b> key while clicking any track's <b>FX Bypass</b> button.

The first of the performance meter's two right click menus is accessed by right clicking in the track list area.

In order to do this ...	In the Performance Meter window do this ...
<b>Open FX Window for that track.</b>	Right click on track name, choose <b>Show FX Dialog</b> .
<b>Toggle FX Bypass On/Off.</b>	Right click on track name, choose <b>Toggle FX Bypass</b> .
<b>Toggle track mute for that track.</b>	Right click over any track, choose <b>Toggle Track Mute</b> .
<b>Show in/hide from Performance Meter (PM) list tracks with no FX.</b>	Right click on any track, enable/disable <b>Show track FX when empty</b> .
<b>Show hide in PM master track/monitoring when these have no FX.</b>	Right click on a track, enable/disable <b>Show master FX when empty</b> and/or <b>Show monitoring FX when empty</b> .

The other menu (see below) selects what you want shown in the window. Right click anywhere in the main Performance Meter area to display this. You can also use this menu to move the window to the docker.

**Tip:** You can select several tracks – using **Ctrl Click** – then right click over any of their track numbers in the Performance Meter to Toggle FX bypass and/or Track Mute status for all tracks in the selection.

## Customizing the Performance Meter

You can customize the information shown on the performance meter, making your selections from its context menu (see right). Amongst the items that can be displayed or hidden are:

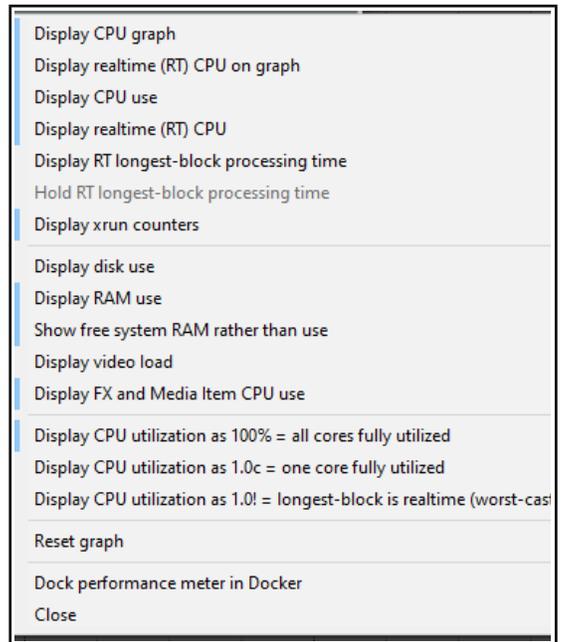
CPU Graph      CPU Use      Disk Use  
RAM Use      Free System RAM      FX CPU use

There are also options to display CPU utilization with all cores or one core fully utilized, or longest block is realtime (worst case scenario). The last of these can help diagnose problematic real-time plug-ins.

The Performance Meter track list can be sorted by clicking on any column heading. It can also be docked or undocked.

If [ReaMote](#) has been installed and enabled (see Chapter 23), the Performance Meter will display an additional ReaMote column.

**Note:** The RT ("Real Time") CPU meter measures the amount of CPU time used by the audio thread servicing the sound device. Since it is measuring a single thread, it reflects only the CPU time used by one core, and gives you an indication of how much leeway you have in processing. With anticipative FX enabled (and few tracks record armed), RT CPU will generally be pretty low, as most things should be done asynchronously, allowing the real time thread to quickly put things together.





# **REAPER User Guide**

## **Main changes, version 6.68**

September 2022

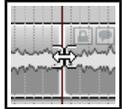
This document reproduces those sections of the User Guide that are either new or have important modifications.

Any minor tweaks and twiddles are not included here, but are listed on page 13 of the main document.



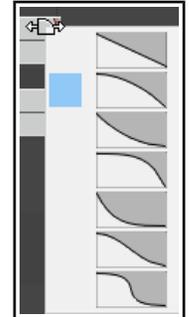
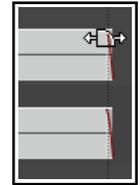
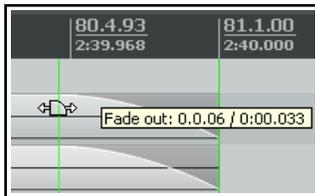
This section has been edited mainly to include relative edge edits.

## Adjusting Media Item Fades



If you select any item in a track and zoom in close enough, you will see a fadeout curve at the end of that item. You can change both the shape and duration of this curve, either using the mouse, or thru the **Item Properties** dialog box.

1. Select the rightmost item on one or more tracks. In this example (right) two tracks have been selected. These items might be, but need not be, vertically aligned.
2. Hover your mouse over the vertical white line that marks the start of the fade. The mouse changes to display a curved shape.
3. Click and hold down the left button. Drag left to increase the length of the fadeout (see below left) then release the mouse. Notice that the fadeout curve is now more gradual. If you were to slip edit any or all of these items, the fadeout would keep its shape and duration – it would just begin sooner.
4. Make sure that your media items are still selected.
5. Right-click over the vertical line that marks the start of the fade. A menu of different curves will be displayed (see right). You can select any of these.



Instead of using a mouse, you can use the **Item Properties** dialog box (press **F2**) and make changes there. Also, you can use **Alt left click** to delete a fade, or **Ctrl left click** to cycle thru the different shapes.

The **Options, Preferences** dialog box includes an option on the **Project Media Item Defaults** screen to specify default fade and crossfade length, overlap, and shape characteristics. See also **Chapter 22**.

In addition, the **Preferences, Mouse Modifiers** page (shown right) gives you additional functionality by using modifier keys with your mouse when working with fades and crossfades. Options are available for left click, left drag and double-click.

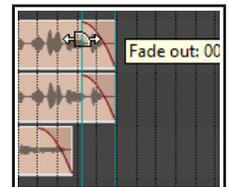
Mouse modifiers	
Context: Media item fade/autocrossfade	
left drag	
Import/export	
Modifier	Behavior
Default action	Move fade ignoring snap
Shift	Move crossfade ignoring snap
Ctrl	Move fade ignoring snap and selection/grouping
Shift+Ctrl	Move crossfade ignoring snap and selection/grouping
Alt	Move fade and stretch crossfaded items ignoring snap
Shift+Alt	Move crossfade and stretch items ignoring snap
Ctrl+Alt	Move fade ignoring snap (relative edge edit)
Shift+Ctrl+Alt	Move crossfade and stretch items ignoring snap and selection/grouping

For example, holding Shift while dragging the mouse left or right will move a crossfade left or right. Alt drag will move and stretch the fade. Other default settings are shown above. These actions can be used on a single media item, or on a selection of media items, and can be customized (see **Chapter 15**).

### Relative vs Absolute Edge Edits

Unless defined as relative, media item fade edits work in absolute mode: this means that within a selection, only those items whose edges align exactly along the timeline will be affected. Actions which work in relative mode (in this context, for example, Ctrl Alt left drag) will be applied to all items in a selection, regardless of where they lie on the project timeline.

In the example shown here (right), relative edge fading is being applied to three tracks by using **Ctrl Alt left drag**. All three are edited, even though their positions do not all align.



This section has been renamed and edited to place more emphasis on and a clearer explanation of armed actions

## Smart Tools and Armed Actions

If you have used other DAW software (such as Cubase, Pro Tools or Sonar) before coming to REAPER, then you might be used to using a toolbar for various editing tasks, such as splitting, deleting or muting items. You have already seen that this method of working is not native to REAPER. However, if you wish, you can create your own smart tools whose actions can be armed and used in a way similar to that with which you are familiar.

The Actions List includes numerous of actions suitable for this sort of treatment.

This example will use the action. **Item: Split item under mouse cursor**. Other suitable actions include **toggle item mute**, **item properties toggle solo**, or to **delete items**.



Without armed actions, any tool which makes reference to the mouse cursor, for example, would otherwise be useless – because the mouse cursor will be over the toolbar, not any media item, when the tool is clicked! By using smart tools we solve this problem.

To create a Smart Tool for any action or custom action, you first need to assign the action or custom to the toolbar, as explained in the section before this one. In this example, we have created a button to **Split Item Under Mouse Cursor**. Then, to use it as a smart tool, simply do this:



1. Right click over the tool. If you hover the mouse there long enough, a tool tip will be displayed. Move the mouse over any media item and it will change to a letter **A** (indicating that the toolbar action is armed).
2. Left click on (in this example) the item to which you want the action applied, at the exact position that you want the action to occur. In this case, the item beneath the mouse cursor will be split.

Once a tool is armed it will remain armed until you “unarm” it. For example, as long as a smart tool to toggle item mute is armed then every time you click on an item the mute status of that item will be toggled on/off. To unarm it, either right click on the armed tool. or press **Esc** immediately after using it.

