

Up and Running: A REAPER User Guide

**Version 2.14
21st March 2008**

This guide is a permanent work in progress and will be updated regularly as the software itself is further improved and developed.

You are encouraged to distribute it freely to others so long as you do not charge any money for doing so.

Check for updates and other information at

[**http://www.cockos.com/reaper/**](http://www.cockos.com/reaper/)

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Foreword and Acknowledgements

REAPER isn't just about software, and it isn't just about making music. It's about a whole lot more.

REAPER is a whole community. It represents the way music should be, the way the internet should be, the way computers should be, the way program development and licensing should be in fact, the way the world should be.

It's about collaboration and co-operation. And it is truly awesome.

If you've already laboured or suffered at the hands of some software companies, you'll know exactly what I'm talking about. If you haven't been there, then, believe me, you don't want to.

This User Guide could not have been produced without the help of many of the fine people in the REAPER community. If I try to mention everybody, I'll be sure to miss some out, so I'll just mention those whose assistance has been absolutely invaluable:

Malcolm Jacobson for his extraordinary efforts in getting together the first REAPER manual. Without this valuable resource, this document could not have been produced..

Jason Brian Merrill (and others) for their input into the Cockos WIKI. This has been used extensively in the preparation of this document.

Art Evans for his technical advice, endless patience and constructive input.

Bevan Fowke (aka **Bevosss**) for supplying most of the macros used in the Macro Advantage Section.

Mike Lacey and **Simon Mullings** for the patient hours spent on the tedious job of proof-reading.

Pipeline Audio for those great video tutorials.

And, of course ...

Justin and **Christophe**, for bringing us REAPER

So welcome to REAPER! This User Guide is intended to get you up and running in REAPER, and to help you understand better how the program works, so that ultimately you will better be able to help yourself.

If you are new to the world of digital audio, you'll find that there is more than enough information in here to get you "up and running". You'll probably find that some sections contain information that you'll find difficult to understand and which you might not need at first. You can just skip over those sections and come back to them when you're ready.

If, like me, you have come to REAPER with experience of other DAW software, you'll find that it pays to go over even the most basic sections, to help you understand how REAPER is designed, and how it slots together. You'll find yourself asking, "Why can't they all be like this?" You should also find plenty more to interest you.

It is not intended to be (and nor will it ever be) a 100% reference manual covering every single aspect and detail of REAPER. I've tried to approach the topics in what seems a fairly sensible order, introducing items pretty much on a "need to know" basis. In doing so, I've been as careful as I can be to ensure its contents are clear and accurate, but cannot accept any responsibility for any errors or problems you may encounter in applying it to your work.

Finally, I'd like to make it clear that (apart from the extract from the COCKOS Web Site) any views or opinions expressed here or anywhere else are entirely my own, and have not been endorsed by COCKOS software or any other person or body associated with REAPER. I hope that you get as much from REAPER as I have, and that this User Guide is more than a little help to you along the way.

As REAPER evolves, this User Guide is frequently updated. Be sure to check the REAPER Downloads page (see opposite) regularly to check for updates.

- Geoffrey Francis, Mar 2008

REAPER Web Resources

The REAPER project is a live, dynamic and ongoing one. Be sure to check these web sites often and often:

<http://www.cockos.com/reaper/>

<http://www.cockos.com/reaper/download.php>

<http://www.cockos.com/reaper/features.php>

<http://www.cockos.com/reaper/feat-techspecs.php>

<http://www.cockos.com/forum/forumdisplay.php?f=20>

http://www.cockos.com/wiki/index.php/Main_Page

<http://www.jesusonic.com/resources.php>

The REAPER Home Page

The REAPER Downloads Page

REAPER Features summary

REAPER Technical Specs

The REAPER Forums

The REAPER Wiki

Jesusonic plug-ins and presets

Sample Project Files

These are available for download from http://www.cockos.com/wiki/index.php/Reaper_User_Guide

These files are in .MP3 format. Some of the examples outlined in this book require recording further tracks in MP3 format. In order to be able to do this, you will need to have the file **lame_enc.dll** installed in your REAPER program directory.

This file can be downloaded from a number of locations, including http://www.free-codecs.com/download/Lame_Encoder.htm

After downloading, simply copy this file into your REAPER program folder.

Getting a Printed Copy of this User Guide

A printed copy of this User Guide can be purchased on-line from <http://www.lulu.com/content/1295509>

At the time of writing this, the anticipated price was around **\$20** US, plus postage. Be aware, however, that as this User Guide grows, so might the price.

Getting a Printed REAPER Keyboard Shortcuts Summary

A free PDF file is available for summary with a grouped and tabulated summary of the default REAPER keyboard and other shortcuts. It is recommended that you download this from:

US letter page format: <http://www.cockos.com/~glazfolk/ReaperKeyboardShortcuts.pdf>

International A4 page format: <http://www.cockos.com/~glazfolk/ReaperKeyboardShortcutsA4.pdf>

Up and Running: A REAPER User Guide

From the COCKOS Web Site ...

Cockos Incorporated was founded in 2004 as a software development company with philanthropic goals.

The engineers who founded Cockos were tired by the frustration and oppression of working within large companies. Large public companies often find themselves slaves to their shareholders and while focusing on money, lose sight of what's really important.

The software development background of Cockos is extensive--our employees have developed end-user software, software distribution tools, peer-to-peer network and media streaming architectures that are used by many millions of people (examples include Winamp, NSIS, Gnutella, and SHOUTcast).

Some rules we try to follow:

- *Give new features to customers quickly: the paradigm of batching updates and then selling them is both a terrible experience for the customer, and detrimental to the quality of the software.*
- *Avoid copy-protection and DRM schemes: these schemes are almost always ineffective, and usually result in a poorer experience for paying customers than for pirates.*
- *Price software reasonably, trust your customers*
- *Resources should be spent on product development whenever possible. To the consumer, this translates to more bang for the buck.*

<http://www.cockos.com/company.php>

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The Main Stuff

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1 Setting Up and Getting Started

1.1 Introducing REAPER

REAPER is a powerful Windows application for multitrack recording and editing of audio. REAPER provides a flexible but easy to use interface that is suitable for professionals and non-professionals alike.

For more information on REAPER's large range of easy to use features and in depth capabilities, check out the Features and Technical Specifications pages:

<http://www.cockos.com/reaper/features.php>

REAPER Features summary

<http://www.cockos.com/reaper/feat-techspecs.php>

REAPER Technical Specs

To download REAPER, visit the download page:

<http://www.cockos.com/reaper/download.php>

The REAPER Downloads Page

REAPER is reasonably priced, sustainably developed, uncrippled unexpiring shareware. To purchase your REAPER licence, visit the Purchase Page:

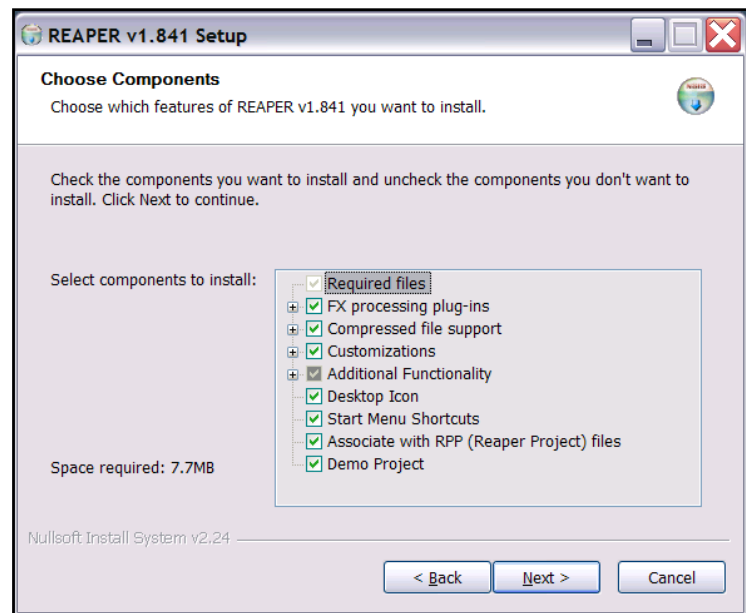
<http://www.cockos.com/reaper/purchase.php>

The REAPER Purchase Page

1.2 Installing REAPER

After downloading the REAPER install file, follow this sequence:

1. In Windows Explorer, find the folder to which the REAPER install file was downloaded. The file name includes the current version number, and will be something like **reaper 201-install.exe**.
2. Double click on this file name to run the install program.
3. If you agree with the Licence Conditions, click the Agree button to continue.
4. Select which elements you wish to install (see picture right and comments below).
5. Accept the default folder offered to you – **C:\Program Files\REAPER** – and click Install.
6. Wait while the program installs.
7. When prompted, click on **Close** to Close the Install program, then **No** to indicate that you do not yet want to run REAPER.



TIP: At the time of writing this, a full and detailed list of all the Install options can be found on the web site at <http://documentwrite.com/reaper/>

If you choose not to install any REAPER program elements or options, you can later change your mind by simply running the install program again.

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1.3 The Install Options

The Install screen gives you the opportunity to decide which REAPER elements you choose to install and which ones you prefer not to install. Listed below is a summary of your main options.

FX Processing Plug-ins	This is a collection of Audio and MIDI FX that is supplied with REAPER – such as a Compressor, a Noise Gate and a Synthesizer. Usually you should make sure this option is ticked.
Compressed File Support	This allows you to work with file formats such as MP3, OGG, APE (Monkey's Audio), FLAC and WavPack as well as Video files. Note that to render (mix down to) MP3 files you will also need to download from the internet the file lame_enc.dll and then copy or move it into your REAPER program directory.
Customizations	This allows for the use of European keyboards and offers you the option to later choose any of a number of colour schemes for REAPER.
Additional Functionality	This allows you to install elements such as the Media Explorer, CD Burning and Rewire. These aspects will be discussed later in this guide. If you are new to REAPER, you might wish not to install at this stage the ReaRoute ASIO driver, nor ReWire nor ReaMote. This makes for simpler options when audio routing. You can always add these later.
Desktop Icon	Leaving this option selected ensures that a REAPER shortcut icon will be placed on your Windows desktop.
Start Menu Shortcuts	Leave this option ticked to ensure that REAPER is added to your Windows Start Menu.
Associate with RPP Files	Ticking this option will enable you to open REAPER with any of your REAPER Project files direct from Windows Explorer or any desktop shortcut that you might create for your projects.
Demo Project	If you leave this option ticked, a sample project file will also be installed along with REAPER. This is not the same as any of the sample project files associated with this User Guide.

1.4 Software Updates

REAPER is updated frequently and regularly, with bug fixes, new features and other enhancements. At the time of writing, updates are being released at the rate of two or three a week.

You can check for updates at any time by visiting <http://www.reaper.fm/> Simply download and install. There is no need to first uninstall any previous version. Existing preferences and settings will automatically be carried over.

TIP: An option is available under Preferences to have REAPER automatically check for updates each time the program is started (provided of course you are on-line at the time). You will be shown how to select this option later.

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1.5 Starting REAPER

To start REAPER, just double click on the REAPER desktop icon.

TIP: You can assign a desktop shortcut key within Windows, to make it even easier to start up the REAPER program. To do this:

1. Right click over the REAPER shortcut icon on your desktop.
2. Choose **Properties** from the menu, then click on the Shortcut tab.
3. Tab to or click on the Shortcut Field
4. Press your preferred shortcut, e.g. Ctrl Alt R.
5. Click on **Apply**.
6. Click on **OK**.

1.6 The REAPER Screen

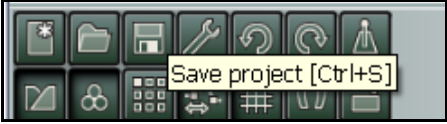



Note: REAPER allows you to select from a large number of different colour themes and skins. It's quite possible that when you first open REAPER a scheme different from that shown above might be applied. Later in this User Guide you will be shown how to select and modify colour schemes.

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When you start REAPER, it displays a screen similar (but not necessarily identical) to that shown above. The example shows a typical project file that has been opened.

Note the following. We'll examine the elements in more detail shortly.

The Main Menu	This is displayed near the top as a row of commands – File, Edit, View, Track and so on. As in other Windows applications, the menu is used to give commands.
The Main Window Toolbar 	Just below the menu are two rows of seven buttons each. This is the REAPER Main Window Toolbar. You might notice it contains fewer tools than do many other apps. Does this mean that REAPER doesn't do as much? No, it just means it's a smarter program! Depending on the colour theme in use, your buttons might not look the same as those shown. However, as with other Apps, you can hover your mouse over any Tool to obtain a tooltip (see example, left).
The Track control panels (TCP) 	These are the areas which are used to control the behaviour of your audio and MIDI tracks – in this example there are 12 tracks, labelled from top to bottom Vocals, Lalala etc. Of course you can have as many tracks as you need, subject only to any limitations imposed on you by your hardware. Notice that each track has its own set of controls, and again, tooltips are available for each of these.
The Main Window and Edit Area	This is to the right of the Track Panes. It displays the actual Media clips (or items) that make up your tracks. This can be any combination of Audio and MIDI items. Video items can also be included, but that is beyond the scope of this guide.
The Mixer	This is displayed (in this example) across the bottom of the screen. Notice that it includes a MASTER output track.

Don't be surprised if your screen doesn't look quite the same as this, or even if it looks a lot different. The REAPER screen can be customised to suit your individual needs. We'll be covering this in Section 2.

1.7 REAPER Selections, Controls and Commands

Working in REAPER consists largely of making selections and giving commands. Sometimes you will want to do something to one item, perhaps just one audio clip. For example, you might have an item (or clip) that you no longer need, and which you wish to be deleted. In this case, you will select that item (usually using your mouse) and then give the appropriate command to tell REAPER to delete it.

Other times, you will want to give a command that affects the whole of your project file. For example, you might wish to save all your work to date. In that case there would be no need to select anything – you would only need to give the commands.

There are four methods commonly used to give commands in REAPER:

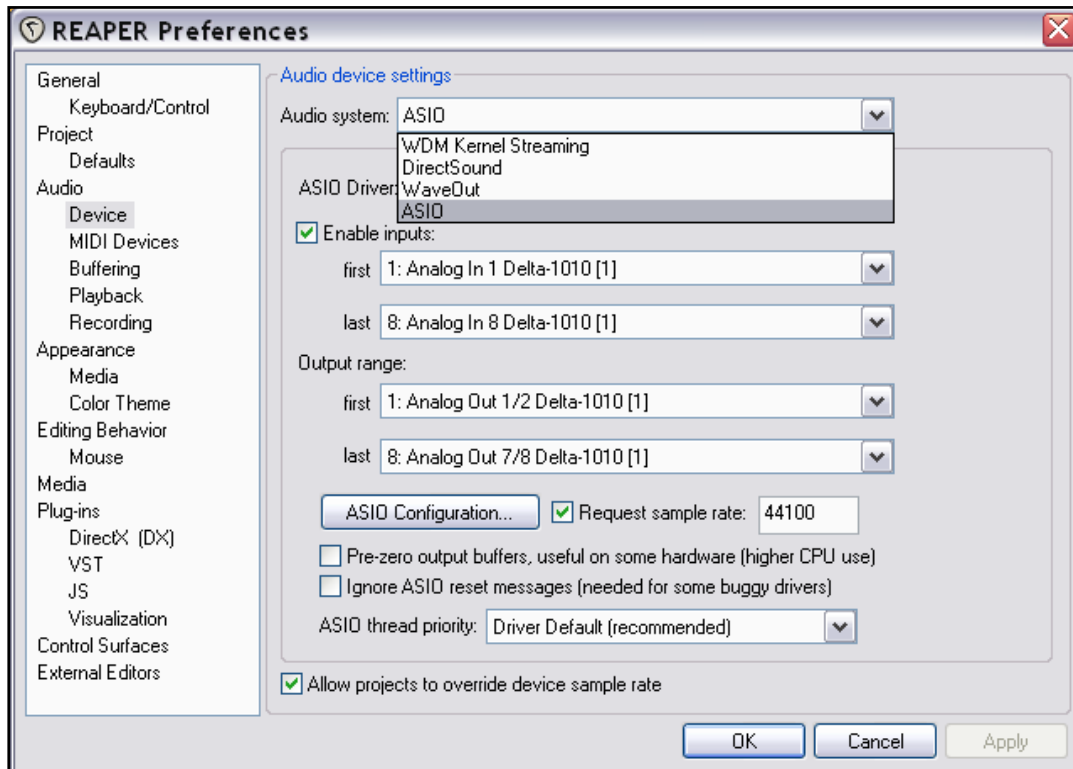
The Main Menu	As with other Apps, this is accessed by the mouse or keyboard.
Context Menus	Clicking your right mouse button over an item or area of the screen will display a menu relevant to where you have clicked.
Toolbars	Clicking your mouse on any tool causes its command to be executed.
Keyboard Shortcuts	Keyboard shortcuts can be assigned to most controls and functions. This is an important and powerful aspect of REAPER. This topic is covered in detail in Section 4.

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1.8 Setting Up For Audio

Before you can record or play anything, there are a few setup options that have to be specified. This section covers setting up audio. This is where you tell REAPER which audio device(s) you have, and how you wish to use them.

To set up your Audio Device, first choose the **Options, Preferences** command from the Main Menu, then select **Device** under **Audio** from the list of available topics:



From this screen, you should select:

Audio System	Choose ASIO if ASIO drivers are available for your PCI sound card or Firewire or USB device.
ASIO Driver	For best results, choose the ASIO driver(s) for your device.
Enable Inputs	This option needs to be turned on (ticked) if you wish to use REAPER for recording.
Input Range	If your device has multiple inputs, specify the first and last device that you want to be available. In the example above, eight inputs are available, This enables up to eight microphones or lines (in any combination) to be used simultaneously for recording.
Output Range	If your device has multiple outputs, specify the first and last that you wish to be available. Usually, your MASTER bus will direct output to a single pair of outputs, but you can use others for other purposes.
ASIO Configuration	Clicking this button gives you access to the Control Software for your audio device settings.

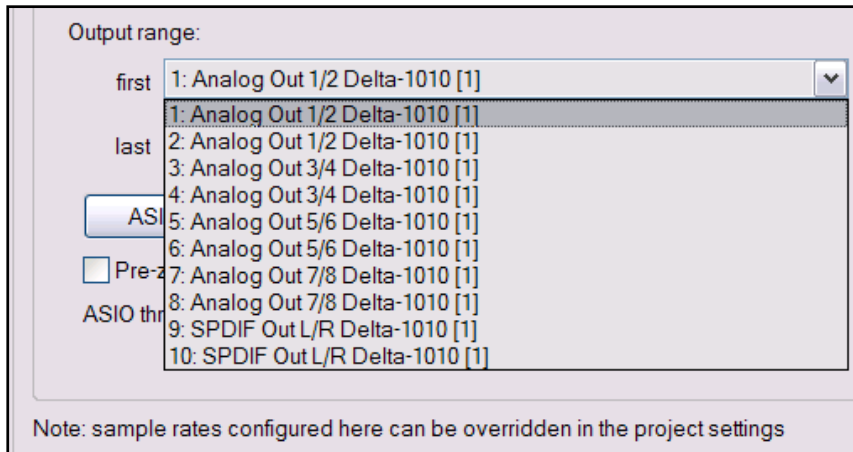
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1.9 Output Aliasing

REAPER supports a feature known as **Output Aliasing**. This enables you to give names to your audio outputs, names that make sense to you.

This is especially useful if your soundcard or other audio device provides multiple outputs. For example, one pair of outputs might be connected to your control room monitors, another to studio monitors, and a third pair to a multi-output headphone monitor.

At the same time your sound card outputs will have names something like this:

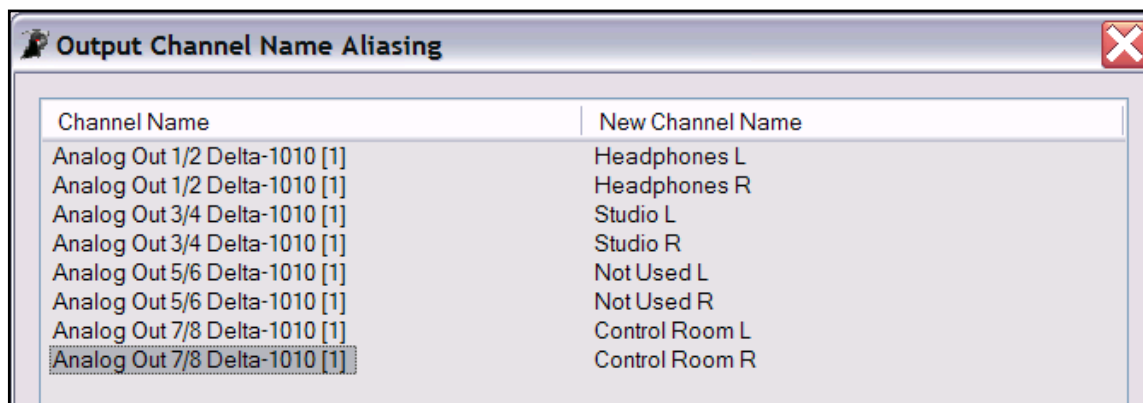


Clearly, these names are not very useful to you.

By assigning Aliases to these outputs, you can ensure that whenever you need to display a list of your outputs (for example, when determining the destination of the output from your Master) your own names will be displayed, instead of the hardware device names.

To create output aliases:

1. Choose the **Options, Preferences** command.
2. Display the **Audio** page and make sure you have ticked the option **Output Channel Name Aliasing** (this is the last item on this screen).
3. Click on the **Edit Names** button for this item.
4. Double-click on the Channel Names (each in turn) to edit them – an example is shown below:

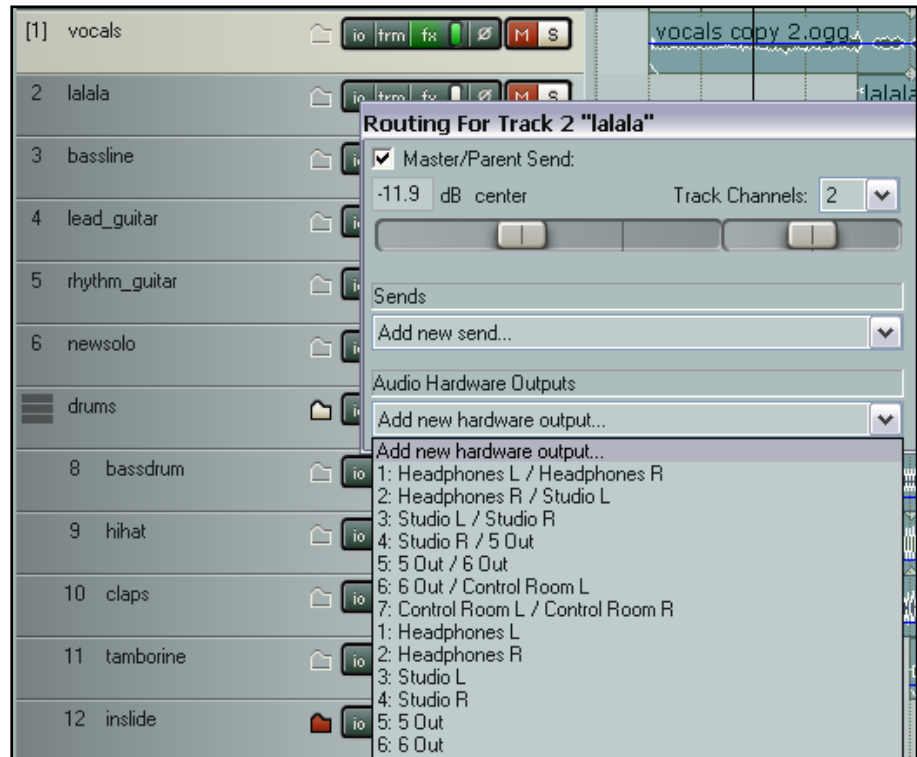


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5. Click on **OK** to close this window and return to the **Preferences** dialog box.
6. Click on **Apply** and **OK** to close the Preferences dialog box.

Your specified names should now automatically be used throughout REAPER.

Section 2 will deal with assigning outputs, but an example of how one screen might now look is shown on the right.



1.10 Input Aliasing

REAPER also supports **Input Aliasing**.

Input aliasing is a term which refers to the ability to give your own names to your audio inputs.

This is often used simply to shorten the long names that the system will often give your audio inputs, especially when your device supports multiple inputs.

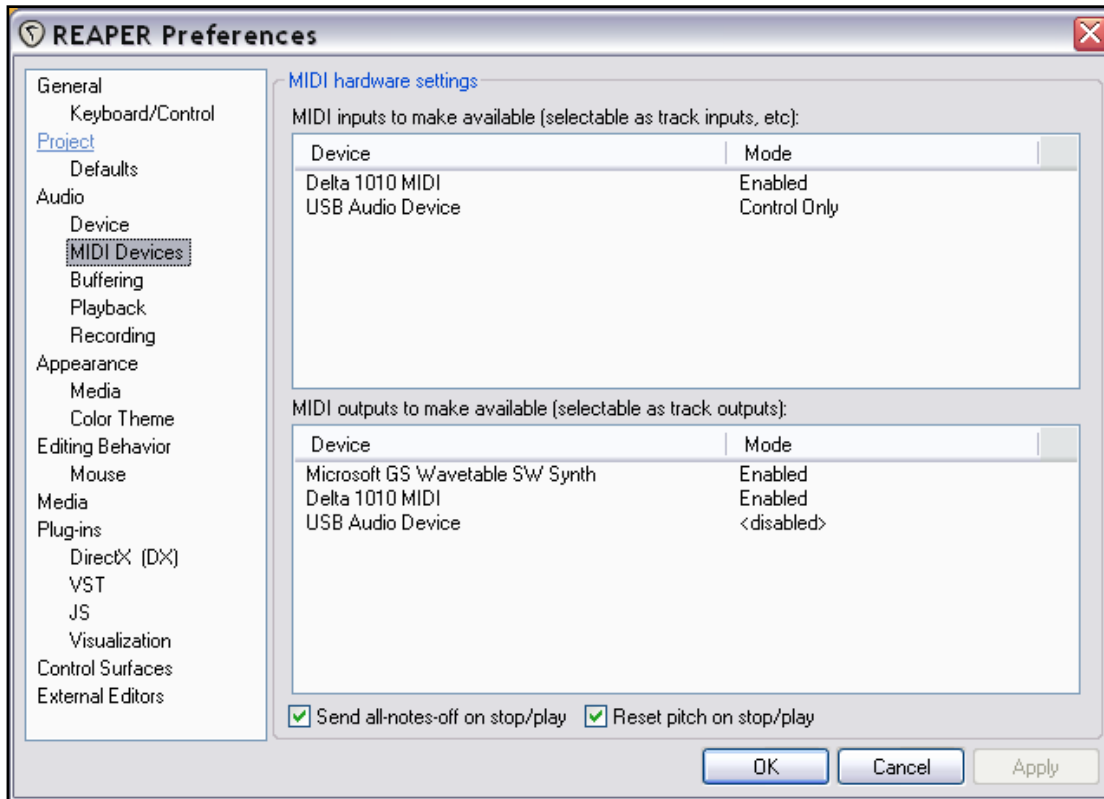
Input Aliasing is performed in much the same way as Output Aliasing, except that on the **Audio Preferences** screen you select **Input Channel Name Aliasing** instead of Output Channel Name Aliasing.

An example of the use of this feature might be to change names like **Analog In 1 Delta 1010 (1)**, **Analog In 2 Delta 1010 (1)** and so on to just **Input 1**, **Input 2**, etc.

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1.11 Setting Up For MIDI

If you intend to use MIDI at all, you should enable your MIDI devices. Many PCI sound cards, Firewire and USB audio devices include a MIDI input and output port (for use, for example, with a MIDI Keyboard). To enable these devices, choose **Options, Preferences** from the Main Menu, then display the **MIDI Devices** screen under **Audio**.



On this screen you should select in turn each of the listed MIDI Input and Output devices and right-click over its name, then choose **Enabled**. If you need to specify a time offset for any MIDI Output device, right click over the device name and choose **Configure Output** from the context menu (see right).

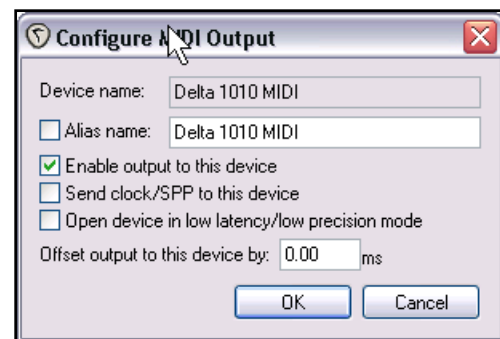
If you have a Control Surface, such as a BCR2000, which you intend to use with REAPER, then you should set its input mode to **Control Only**. The use of Control Devices will be explained later in this guide.

Other Audio Preferences

You can see that there are other Audio Preference screens that we have not yet examined, including **Buffering**, **Playback** and **Recording**.

These will be examined later in this User Guide, in a more appropriate context. When getting started, you should be able to just leave these settings at their defaults, only returning to change them later if you find that you wish or you need to do so.

When finished, clicking on **OK** will, of course, close the **Preferences** box and cause your settings to be remembered.



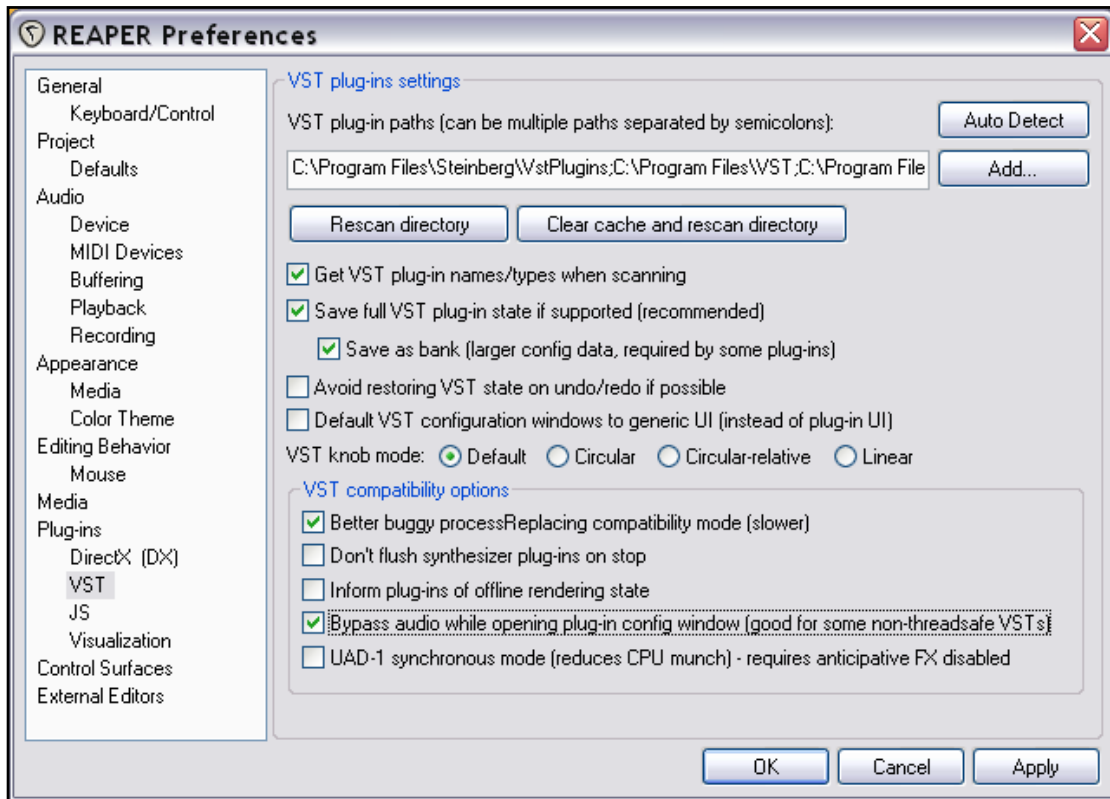
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1.12 Enabling Plug-ins

There's one further Preferences screen you will probably want to visit before you get started – **VST Plug-ins**. As with Audio Preferences, REAPER has several pages of Plug-in Preference screens, but these can (at first at least) be left to their default settings.

However, if you already have a collection of VST and/or VSTi Plug-ins on your computer, you will need to tell REAPER where to find them.

To do this, choose the **Options, Preferences** command, then select **VST** under the **Plug-ins** section.



You can leave most settings as they are (at least for now), but you will need to click on the **Add** button to specify the location(s) of the folder(s) where your VST plug-ins are stored.

If your VST plug-ins are spread across more than one folder (this is not unusual), you will need to click on the **Add** button several times, each time selecting one of your folders. Remember to use the **Apply** button after doing so. When you specify a folder for your VST and VSTi plug-ins, REAPER will automatically also scan any subfolders below that folder. Of course, if you miss any, you can return to this screen at any time and add them to your selection later.

When you have finished specifying the location(s) of your VST Plug-ins, clicking on **OK** will close this screen and cause your settings to be remembered.

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1.13 REAPER's Installed Folders and File Locations

If you are used to working with DAW software that leaves a trail of often unintelligible data scattered all across your hard disk and registry, in a seemingly random fashion that makes it impossible to figure out where all your valuable settings are stored, then you are going to love REAPER!

The exact number of installation and preference files you have will depend to some extent on your Install and Preference options, but in general, the story is this:

REAPER's Installed Folders and File Locations	
The Registry	REAPER does <i>not</i> store any install data, settings or preferences in your Windows Registry. Yes, that's right! Windows will set up an item for REAPER under HKEY_ LOCAL_ MACHINE, Software but it will not contain any data. The only other exception to this is that Windows keeps a record of your file movements in Registry areas such as its MUICache but none of these references will affect REAPER's ability to function in any way.
The REAPER Install Directory	By default, REAPER installs to C:\Program Files\Reaper This folder contains the REAPER program files. You should also ensure that lame-enc.dll is also installed to this folder if you intend to use the MP3 format. Many of the optional install items are held in sub-folders of C:\Program Files\Reaper For example, if you chose to install the FX Plug-ins, you will have a folder called C:\Program Files\Reaper\Effects If you chose to install the Colour Themes, you will have a folder called C:\Program Files\Reaper\Color Themes and so on.
The Application Data Directory	Your preferences and other settings are all held in the REAPER Application Data directory. This is created for you when you install REAPER, using your Windows User Name. So if your user name is Joe Soap, look in Windows Explorer for: C:\Documents and Settings\Joe Soap\Application Data\REAPER In order to view the contents of this folder, you might need to turn on the option in Windows Explorer to Show hidden files and folders . Open up My Computer then choose the Tools, Folder Options command, click on the View tab, then choose Show Hidden Files and Folders , then OK . The exact number of files held here will depend again on which options and preferences you have exercised. Expect at least the following:
reaper.ini	This is a text file that contains your various preferences, such as the Audio and MIDI Device preferences that we set up earlier. The Default Values for the various Preferences (under Options, Preferences) are stored here. These defaults are overwritten by your own settings when you change them. This file can be opened and edited using any text editor (such as Notepad) but it is inadvisable to do this unless you are sure that you know what you are doing.
reaper-dxplug-ins.ini reaper-vstplug-ins.ini	These files store data regarding installed plug-ins.
reaper-reginfo.dat	This file stores your product registration data.

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REAPER's Installed Folders and File Locations	
Sub Directories	<p>In addition, you might find that you have a number of sub-directories here, such as:</p> <p>FXChains ProjectTemplates TrackTemplates</p> <p>These are items that you can create yourself as an aid to managing your REAPER projects. If you do so, the appropriate settings are stored in these folders.</p> <p>The topics of FX Chains, Project Templates and Track Templates will all be covered in later sections of this User Guide</p>

There's one more thing that might interest you.

All of the settings, preference and custom files are text files. Any of them can be opened and modified using a text editor such as Notepad.

This even applies to REAPER's project files, with .RPP extension.

Of course, most probably you will never need to do this, and if you do, you should always take a copy first, just in case of any errors or accidents.

Note also that you should **never** try to use a text editing program to open, view or edit any file ending in **.exe** or **.dll**

Tip: You might wish to back up your **Application Data\REAPER** folder to CD. This will ensure that in the event of system damage you will be able to quickly and easily restore all your REAPER settings and preferences.

Tip: It's not difficult to install REAPER onto a USB key and take it with you wherever you go! An explanation of [how to do this](#) follows shortly in this User Guide.

1.14 Uninstalling REAPER

There is no need to uninstall your current version of REAPER before installing a new one. However, should you need to uninstall REAPER for any reason, you should follow this procedure:

1. Click on the Windows **Start** button, then **All Programs**, then **REAPER** then **Uninstall REAPER**.
2. When the REAPER Uninstall Wizard is displayed, click on **Uninstall**.
3. When the uninstall process is finished, click on **Close**.
4. When prompted, choose **Yes** if you wish to see which files have been left on your Hard Drive, otherwise choose **No**.

Tip: If you are likely to be reinstalling REAPER at some later date, do not remove these files. This will ensure that your previous settings and preferences will be recalled when re is reinstalled.

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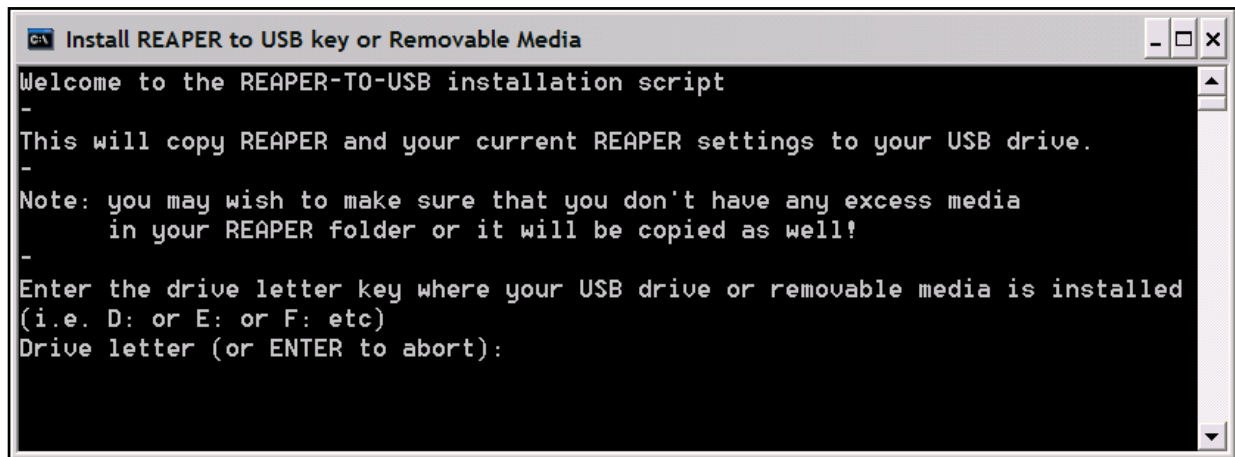
1.15 Running REAPER on a Flash Drive

You can install REAPER on a USB flash device, or other external drive. This ensures, for example, that if you are going to be away from home or your normal workplace, you can take your USB Stick (or whatever portable device you may have) with you, plug it in on any PC, and away you go.

Before you can install REAPER on a flash drive, it must first be installed on your hard drive. When you then install REAPER to an external device in this way, all your settings, preferences etc are also migrated.

Example

1. Insert your external device into an available USB port on your PC. If necessary use Windows Explorer to note its drive letter. This will depend of course on what hard drives, DVD burners, etc you have already installed.
2. Click on the Windows **Start** button, then **All Programs**, then **REAPER**, then **Install REAPER to USB Key or Removable Media**.
3. This causes the following window to be displayed:



4. Type the drive letter followed by a colon (for example, **E:**) and press **Enter**.
5. Wait while the various files are copied. There are a lot of files and this might take quite a few minutes (see tip below).
6. When the process is complete, you will see a message displayed "Press any key to continue...". Press the space bar (or any other key) and the process will be complete.

Note that this process will not copy your VST or DirectX plug-ins to the Flash Drive. You will need to manually copy and install any of these that you may require.

Tip: *You can speed this process up considerably if before commencing this installation you first remove from your C:\Program Files\REAPER\Color Themes folder those colour schemes that you do not use. You can always later reinstall REAPER to your hard drive to restore these.*

To Run REAPER from the Flash Drive

1. Install the Flash drive in a USB 2.0 port on the computer.
2. Open Windows Explorer and display the REAPER folder of your Flash Drive.
3. Double click on **reaper.exe**

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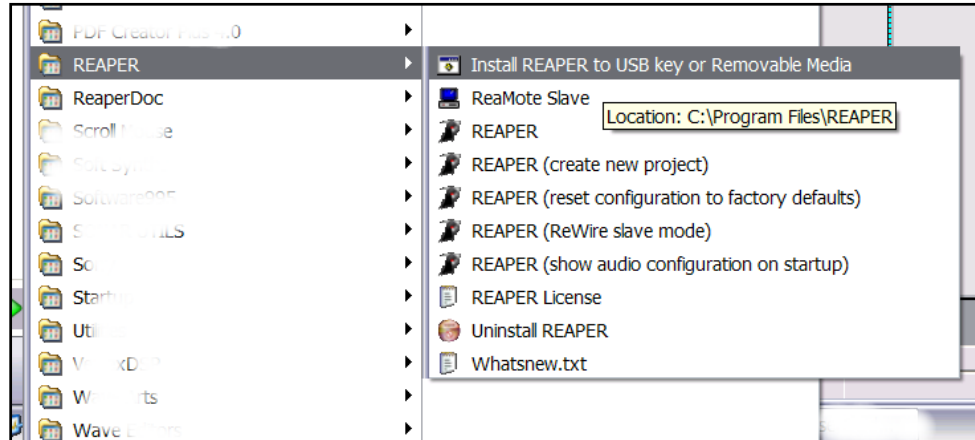
1.16 REAPER Start Menu Options

Most commonly you will probably wish to start REAPER by simply double-clicking on your Windows desktop shortcut. This will cause REAPER to be started in accordance with your existing preferences and settings.

However, for times when you do not wish to do this, you should also be aware of other options available from the Windows **Start** menu.

If you click on the **Start** button, then **All Programs** then **REAPER**, you are presented with a flyout menu of choices.

The main choices are summarized in the table below:



Menu Command	Explanation
Install REAPER to USB key	Use this to install REAPER to a Flash drive or similar device. This is discussed in detail earlier in this section.
ReaMote Slave	The use of ReaMote is currently beyond the scope of this User Guide. However, you can read an overview in Section 21.
REAPER	Starts REAPER normally according to your settings and preferences.
REAPER (create new project)	Starts REAPER with a new project file instead of opening the last used project file.
REAPER (reset configuration to factory defaults)	Starts REAPER and resets all settings, options and preferences to the factory defaults.
REAPER (ReWire slave mode)	Opens REAPER as a ReWire slave. This is beyond the scope of this User Guide, but is discussed in overview in Section 21.
REAPER (Show audio configuration on startup)	Starts REAPER and opens the Audio settings page of your Preferences settings.
REAPER License	Displays License information.
Uninstall REAPER	Uninstalls REAPER. If you need to uninstall REAPER for any reason, you should always use this method.
Whatsnew.txt	Opens the text file displaying a history of new features and changes introduced in each version of REAPER.

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1.17 REAPER Startup Tips

By default, REAPER opens with the last used project. As you will see later, you can permanently change this behaviour if you wish. In addition, you can use hot keys when starting REAPER to override the default settings.

Hot Key(s)	Action
Shift (while starting REAPER)	Opens REAPER without loading last project.
Ctrl Shift (while starting REAPER)	Opens REAPER without loading any default project template.

1.18 REAPER File Types

Like any other software program, REAPER creates a series of files that it uses to store your work. The main file types and their purpose are described in the table below, along with other useful information.

File Type	Example	Explanation
.RPP REAPER Project File	Brad Sucks.RPP	This file is the core of your project. It holds all the information about your tracks and their settings. .RPP files are stored in text format and can be opened and examined using any text editor. In general, however, this is not recommended practice, unless you are encountering a serious issue with the file and you need to examine this.
.RPP-bak Project Backup File	Brad Sucks.RPP-bak	Each time you resave your project file, the previous version is renamed and saved with the .RPP-bak extension. This ensures that if you get into difficulty, you can recover your project from its previous state by opening the project backup file. To do this, simply double-click on the backup file name in Windows Explorer. This will cause REAPER to open with the backup file as a new file, which you can then save.
.RPP-UNDO Undo History File	Brad Sucks.RPP-UNDO	This optional file type will be created if you select the option to save your undo history with your project files. This option is included in the Undo Settings section of the General settings in your Options, Preferences window. This topic is explained more fully later in this guide. As long as you do not delete this text file, you will be able to restore your project at will to any earlier state, even if that is a state that existed days, weeks or even months earlier.
.reapeaks REAPER Peaks File	Guitar.wav.reapeaks	Your reapeaks files contain the information necessary to enable REAPER to draw the waveforms etc. on your media items.
.reapindex REAPER Peaks File	Guitar.wav.reapindex	These files also contain information about your individual media items.

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Notes

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2 REAPER Project Basics

2.1 Opening an Existing Project

To open any existing REAPER Project File, use the **File, Open Project** command, or the keyboard shortcut **Ctrl O**. As with other Windows Apps, you will need to navigate to the appropriate folder to find your project.

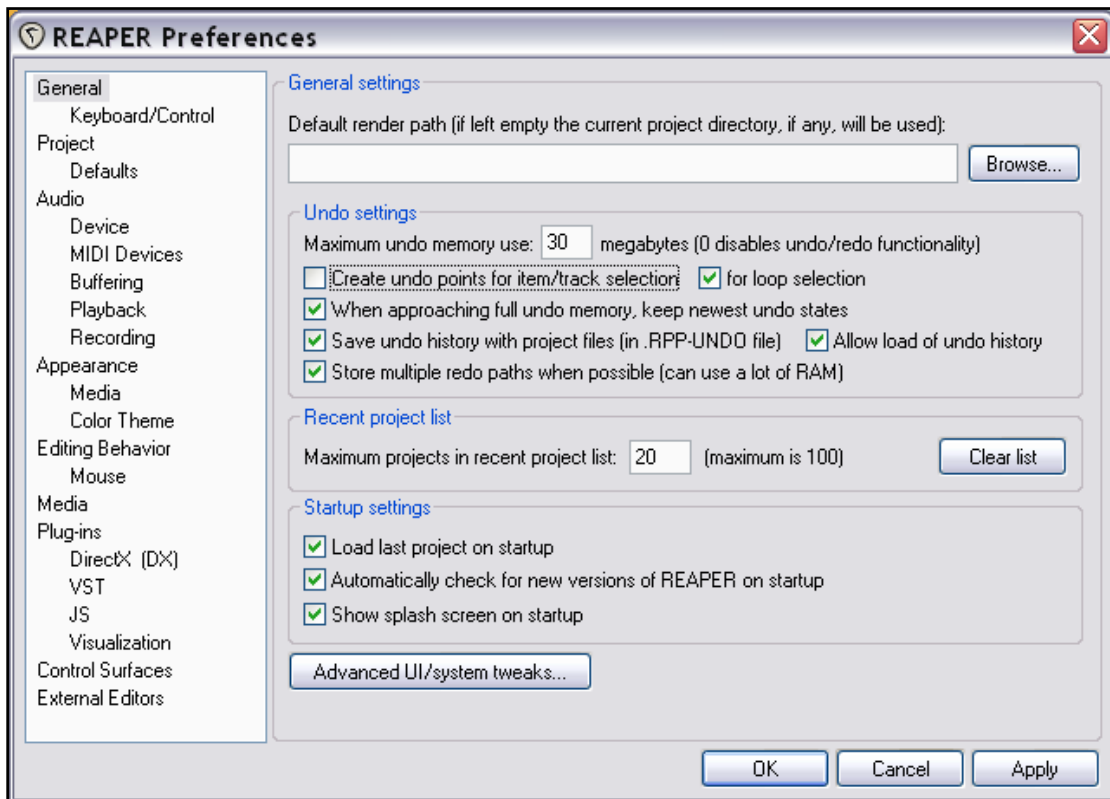
Projects that have been used recently can more easily be opened using the **File, Recent Projects** command.

This causes a list of up to the last 100 recently used project files to be displayed. You can then select any file from that list.

Tips:

1. You can determine the number of files displayed on the **Recent project list** by changing the setting under the **General** category on the **Options, Preferences** screen.
2. On the same screen, you can also specify whether or not you want the most recently used file automatically loaded when REAPER is started. Use the **Load Last Project** option for this.
3. On the same screen you can also specify whether you want to **Automatically check for new versions of REAPER** when REAPER is started.

These three items are shown on the screen below.



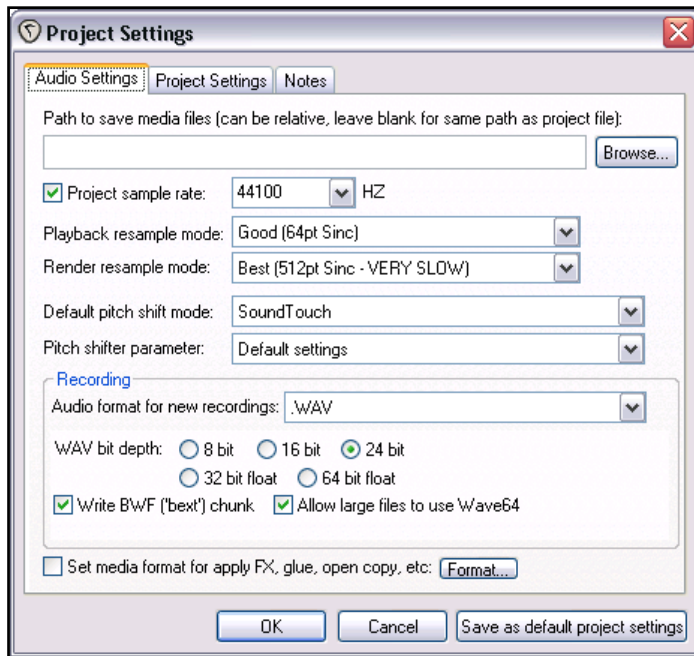
Note: To enhance print contrast, many of the illustrations used throughout this User Guide have been created using colour schemes other than the REAPER default scheme. You should not find this a problem.

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2.2 Project Settings

Every REAPER project has a number of settings that can be defined and changed to meet the requirements of each individual project.

Tip: The examples shown in this section use the project file **All Through The Night.RPP** which is supplied with this User Guide. It might help you to keep that project open while you are using this documentation. Take a copy of this file and work with that. You will then be able to experiment freely without fear of damaging any of your own important projects.



The Project Settings dialog box is accessed by choosing the **File, Project Settings** command, or by using the keyboard shortcut **Alt Enter**. The dialog box has three pages.

Audio Settings

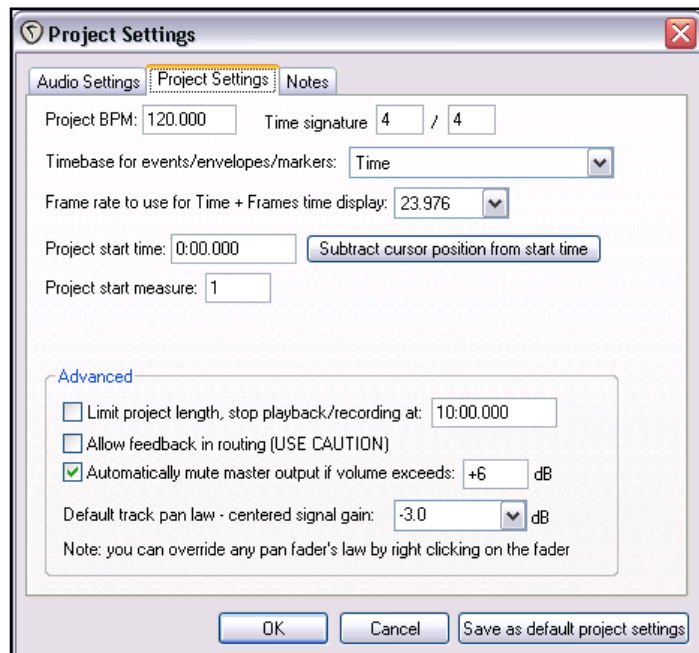
These include:

- Path to store project files (e.g. WAV or MP3 files)
- Project Sample Rate
- Recording format (typically WAV or MP3, but AIFF, FLAC, OGG Vorbis and WavPack are also available)
- Settings and specifications for chosen recording format – e.g. for WAV this includes Bit Depth.
- Default method and parameter to be used for [Pitch Shifting](#).

Project Settings

These include:

- Method for setting the timebase -Time, Beats (position, length rate) or Beats (position only).
- Preferred Frame Rate.
- The option to limit project length and recording time.
- The option to specify the project start time.
- The option to allow feedback in routing. *If in any doubt, do not select this option.*
- The option to automatically mute the Master Output if volume exceeds a specified level. Selecting this option can help prevent accidental damage to your audio device and/or speakers.
- Specifying a default pan law for your



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tracks. The pan law determines how the relative volume of a track behaves when that track is panned more or less to one side or the other.

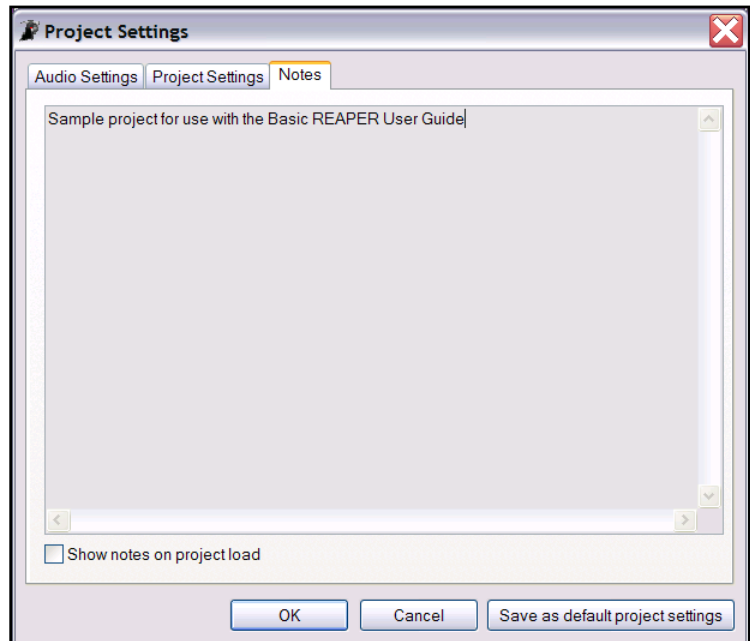
Notes

This is a very handy section that lets you record any notes, comments or information that you would like to be included with your project file.

You can specify that the notes should automatically be displayed each time the project is opened.

Tip: You can save all these settings as the defaults to be used for future new projects. Of course, for any individual projects you can over-write your defaults.

If you are new to digital audio, you probably don't need to worry about pan laws too much. But if you'd care to know more, read on!



Understanding Pan Laws

Panning laws have their origin in analog mixers. With these devices, any linear gain increase in one channel accompanied by a linear gain decrease in the other channel had the result that at the centre position the sum total of the two channels was greater than if the signal was panned full left or full right.

Various techniques were introduced to compensate for this. Pan laws are used to effectively mirror these techniques in the digital world. In short, a pan law of 0db will give you the gain described above. A pan law of -3db will compensate for that gain but will result in a centred mono or stereo file playing back 3dB quieter than its original level.

For further information about panning laws, go to http://www.harmony-central.com/articles/tips/panning_laws/

2.3 Directing Audio Output

This section introduces you to one of the most important core functions of REAPER – **Routing**. Routing is the means by which you ensure that your media (audio and/or MIDI) are directed to where you want them to go, so that your project can be heard exactly as you want it to be heard.

Routing can be very simple or extremely complex – and anything in between. This section introduces you to basic routing concepts. [More complex routing](#) options will be covered later in this Section, also in [Sections 4](#) and [17](#), and elsewhere.



Each track includes an **I/O Button** in its panel toolbar. Shown here, it is the first of the grey buttons on the left.

Clicking that button causes the routing

for that track to be displayed.

To close the Track Routing window, either press the **Escape** key, or click on the little **X** in the top right corner of the window, or simply click anywhere outside the window.

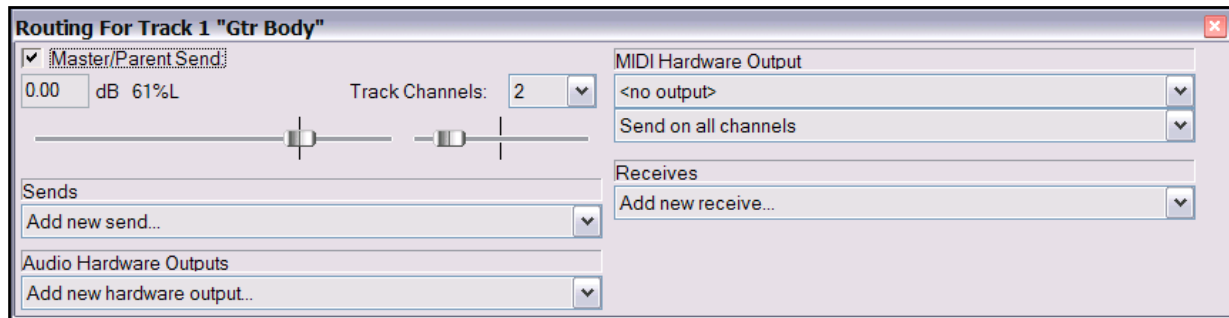
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2.4 The Track Routing Window

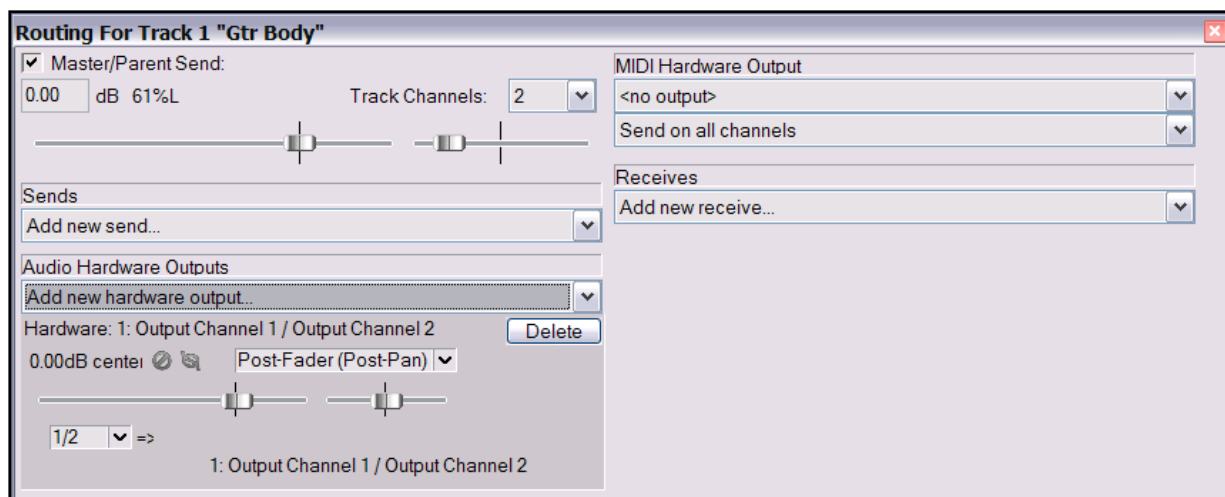
The exact contents of your Track Routing window will vary according to your project structure and your DAW hardware setup (e.g. sound card and audio devices, MIDI devices etc). Setting up these devices is covered in Section 1 of this User Guide.

Depending on the nature of your project, therefore, your display should be *similar* to that shown above, but not necessarily identical. Notice in particular:

- **Master / Parent Send** – Enabling this ensures that the track's output will be directed to the Master. In the sample files provided, you will want to direct the output of all tracks directly to the Master, as shown for Track 1 (below).



- **Sends** – for the time being, we are not using Sends: these will be introduced later. Notice, however, that output can be routed via a Send from any track to any others. This topic will be covered later.
- **Audio Hardware Outputs** – in addition to (or instead of) directing output to your Master Bus, you can also direct output of any track directly to Hardware Outputs on your audio device. If your audio device has multiple outputs, this can be useful, for example, for creating a separate headphone mix, or as series of separate headphone mixes.
- **MIDI Hardware Output** – Use this option to direct MIDI output to an external device or to the Microsoft GS Wavetable Synth.
- **Receives** – again, for the time being we will not be using these.
- Notice (picture below) that when you create a send, you are automatically presented with volume and pan faders which can be used to control this.

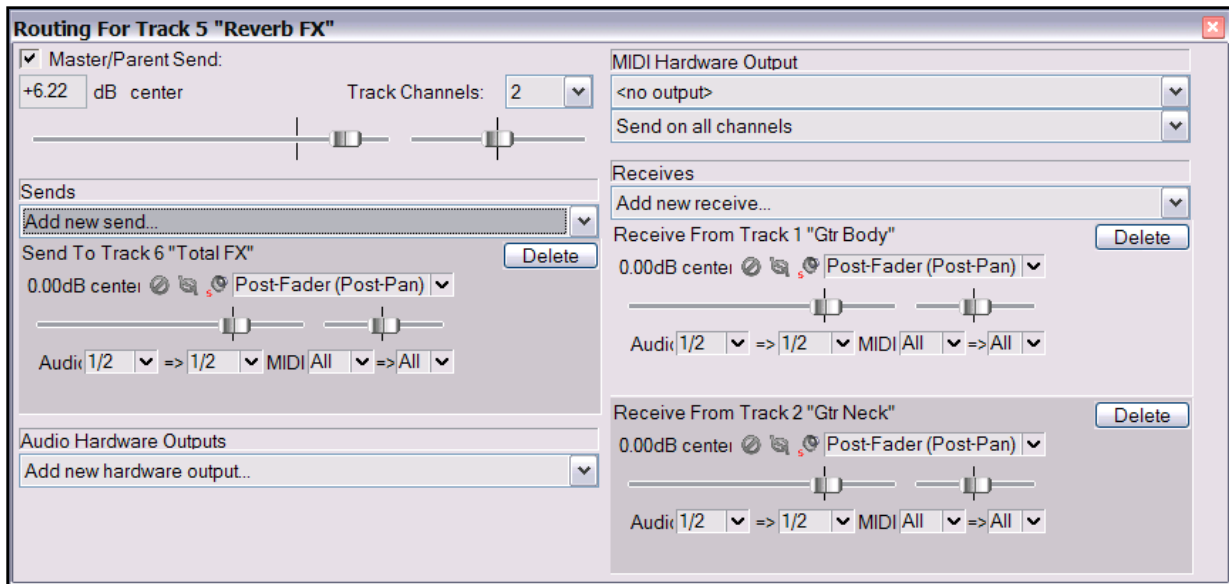


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- Whenever you select any listed track, audio hardware output or MIDI device to be used for a track's routing, controls such as Level and Pan are automatically added to this interface.

When you create a new project, by default the output of each new track is routed to the Master track and from there to the output of your sound card. If that is all you need, you do not need to study the routing options right now. However, understanding REAPER's routing capabilities will almost certainly enable you at some stage to get more benefits from the program, including a more efficient use of your DAW's hardware resources (such as CPU).

The illustration below shows an example of the Track Routing Window for a track for which both **sends** and **receives** have been created. You will be shown how to do this [later in this section](#) and [elsewhere](#) in this User Guide.



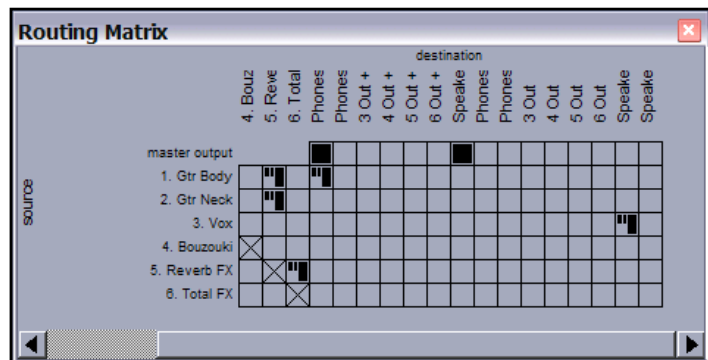
Approach track routing gently at first: it is a very powerful feature of REAPER. The main body of this User Guide will take you through the basics of track routing.

After you have mastered these, you will find some slightly [more complex examples in Section 17](#).

Tip: You can use the **View, Show Routing Matrix** command (Alt R) to display a summary table of your Project's Track Routing. More about this later!

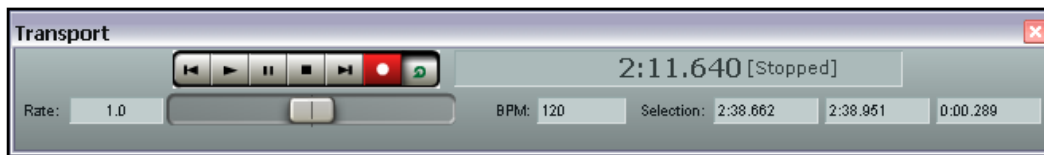
[Get to know the routing matrix!](#)

You will find it to be one of the most useful features of REAPER.



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2.5 The Transport Bar



If the Transport Bar is not visible in your REAPER window, use the **View, Show Transport** command to display it, or use the keyboard shortcut **Ctrl Alt T** to do this.

The Transport Bar might appear as a floating window inside REAPER, or it might be docked just below your track control panels. At this stage, this does not matter.

The Transport Controls (from left to right) are as follows:

Function	Default Keyboard Shortcut
Rewind to start of project	W
Play	Space
Pause at current position	Ctrl Space
Stop and rewind to where play last started	Space **
Go to end of project	End
Record #	Ctrl R
Toggle Repeat (when a loop has been defined) ##	R
Time (current position of the Edit Cursor)	
** May depend on settings under Playback page in Preferences. Optionally, this may be set to <i>Scroll View to Edit Cursor on Stop</i> .	
# To be covered in Section 3 ## To be covered later in Section 2 and elsewhere	

Below the control buttons is displayed a **Rate Control Fader** which can be used to speed up or slow down playback. To the right of that are shown the Project Beats per Minute setting and the start and end positions of any current time selection. Time and loop selection will be covered later in this User Guide.

Other useful Transport Control keys are:

Function	Default Keyboard Shortcut
Go back a little	Ctrl Left
Go forward a little	Ctrl Right
Play (with loop selection skipping)	Alt Space

Right clicking over the Transport Bar displays a context menu. This enables you to:

- Select your preferred time display format.
- Dock or Undock the transport from the Main Window.

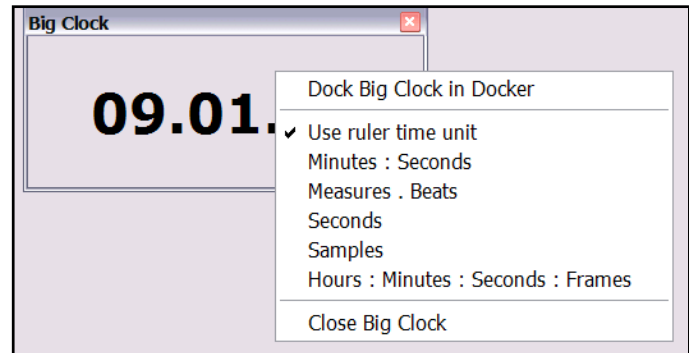
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2.6 The Big Clock

Use the **View, Show Big Clock** command (or press **Alt C**) to toggle on and off the display of the Big Clock, which clearly displays the current position of the Edit Cursor.

This window can be sized and moved at will.

Right clicking over the Big Clock gives you a context menu of options, including changing the display format.



2.7 Track Controls

If you play the project file **All Through The Night.RPP** you will notice that exactly the same sound is coming out of both speakers and that the different instruments and vocals are all competing with each other for the same acoustic space.



That's because no adjustments have been made to the Volume or Pan controls for these tracks.

The larger fader (to the left) is used to adjust a track's volume, the smaller one (to its right) adjusts the panning, sending the signal more to the left speaker or the right speaker as preferred.

To adjust these (or any other faders in REAPER), use any of the following methods:

- Click and hold down the left mouse button over the fader, then drag in the direction required, releasing the mouse when finished.
- Hover your mouse over the fader, and use the Scroll Wheel to adjust the level down/up.
- Click on the fader, then use **Ctrl Down** and **Ctrl Up** to adjust the level down/up.

Tip: To audition possible changes, hold down the **Alt** key while dragging the fader with the mouse. When you release the mouse it will then return to its original position. This can be useful if you need to raise the volume momentarily, perhaps to listen out for a glitch or a phrase.

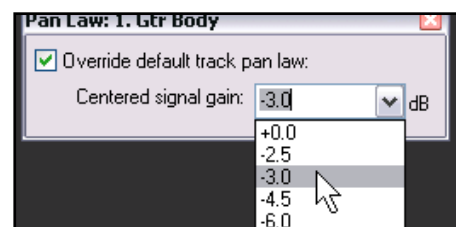
Tip: To perform the same operation on more than one track, hold down the **Ctrl** key while you click on the Track control panel or track number for each track. Then release the **Ctrl** key. Any fader or other movement will be applied to all selected tracks.

The three rightmost buttons on each track's control area have these functions:

Phase Control	Toggles Phase status (normal/inverted) for track or all selected tracks.
Mute	Toggles Mute on/off for selected track (or all currently selected tracks)
Solo	Toggles Solo on/off selected track (or all currently selected tracks)

Notice that by default, track **Solo** causes not only the track itself to be played, but also the output of any sends originating from that track. If you wish to hear only the track, hold the **Alt** key while you solo the track.

You can also change the **pan law** for any individual track. Right-clicking over the track's pan control fader opens a window where you can select from the list or type in your own required pan law for that track.



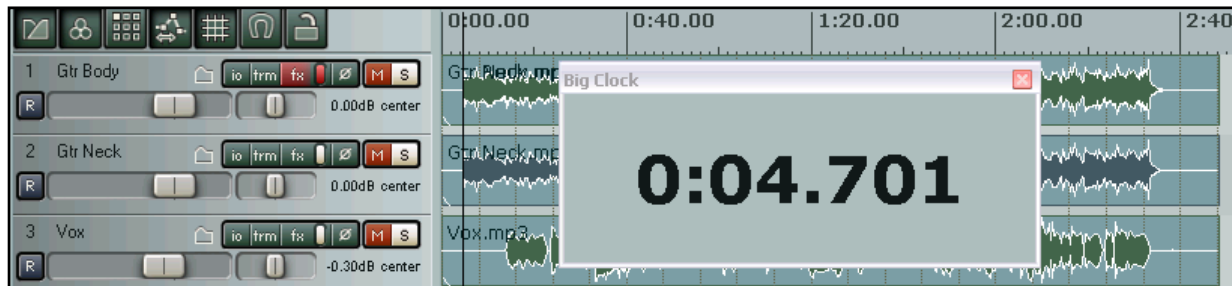
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2.8 Setting the Project Start Time

With most projects, you usually find that you have a few seconds of silence before the recording actually starts. This can create two annoying problems:

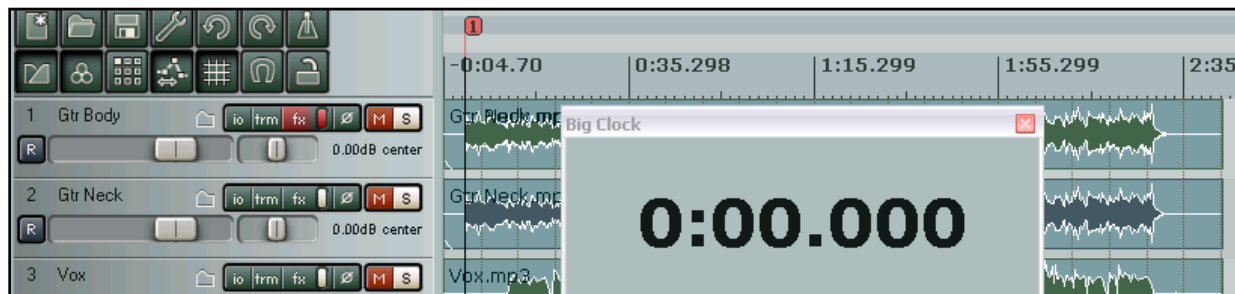
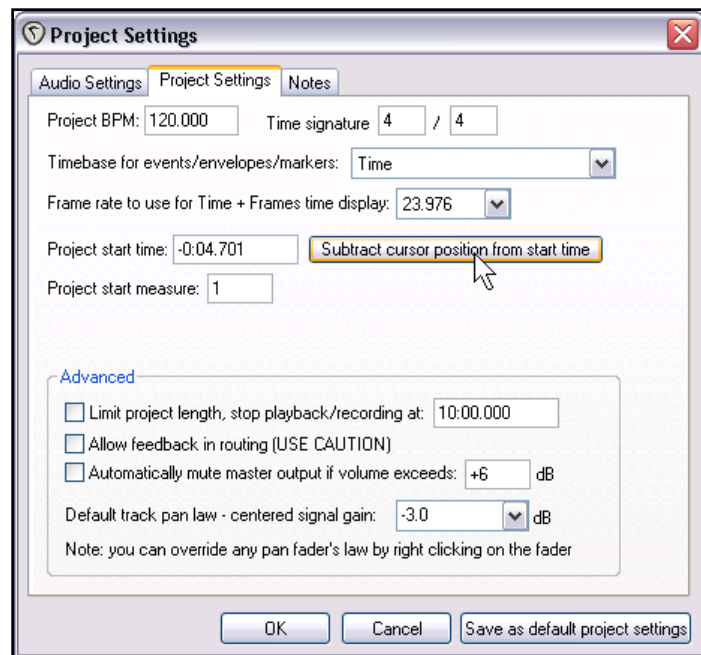
- It means that times shown along the timeline and on the big clock do not accurately represent the time within the song.
- When you go to the start of the project, there are always a few seconds of silence to be played before you reach the start of the song.

In the example shown below the actual start of the song is at 0:04.701. We want to reset this point to Zero.



This is how it is done:

- Place the cursor at the point that you wish to mark as the start of the song.
- Press **Alt Enter** to display the **Project Settings** window.
- Select the tab labelled **Project Settings**.
- Click the button labelled **Subtract cursor position from start time** (see right).
- Click on **OK** to close this window.
- To mark this point, press the letter **M** on your keyboard. This creates a marker on your timeline labelled **1** (see below).
- The position of the marker is now set to **0:00.000** and you can jump straight to this point at any time by pressing 1 on your keyboard.



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2.9 Navigation and Zooming

A REAPER Project can be navigated using the mouse and/or the keyboard.

Adjusting Panel Width

To adjust the width of the track panel area, place your mouse over the vertical border that separates the track control panel area from the main workspace area, until the mouse indicator changes to a horizontal black double headed arrow. Click and hold down the left mouse button while dragging the mouse left or right. Release the mouse button when the desired track control panel width is reached.

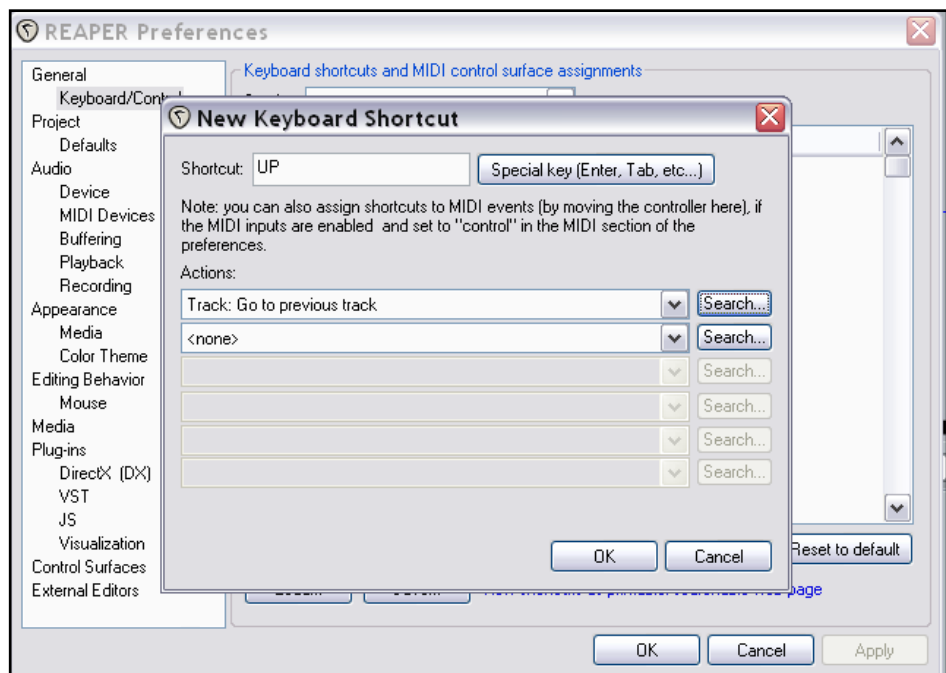
Adjusting Track Height

Click and drag mouse up/down on lower track boundary	Adjust height of single track.
Hold Alt, click and drag mouse up/down on lower track boundary	Adjust height of all selected tracks.
Hold Ctrl, click and drag mouse up/down on lower track boundary	Adjust height of all tracks.

Navigating Between Tracks

You can move from one track to any other by clicking on the required track with your mouse. In addition, by default, **Ctrl Alt Up** and **Ctrl Alt Down** are the keyboard shortcut for moving in the Track Control Panel area from one track to the previous or next track. If you do this a lot, you may prefer to be able to use just one key for each of these tasks rather than three. You can use **Preferences** to [define your own keyboard shortcut](#) for this (or any other purpose). In the example that follows, the **Up Arrow** key will be defined as being used to go to the previous track.

1. Choose the **Options, Preference** command.
2. Select the **Category Keyboard Control**.
3. Click on the **New** button.
4. To define the shortcut key, press the **Up Arrow** key on the keyboard.



5. Display the **Action** drop down list, then scroll down to and click on **Track: Go To Previous Track** (see above)
6. Click on **OK** then (if prompted) **OK** again (to over-ride the existing key binding).
7. Now repeat steps 3. to 6. to assign the **Down Arrow** as the keyboard shortcut for **Track: Go To Next Track**.

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8. Click on **OK** to close the Preferences dialog box. You can save your personal keyboard shortcut setups using the **Save** button.

Toggling Track Height for All Tracks

The following mouse and keyboard shortcuts can be used to adjust the track height for all tracks in a project:

Keystroke	Default Function
` (this is the key immediately to the left of 1 , usually directly above the Tab key).	Toggle between Normal track height and Minimised track height.
~ (this is the Shift key in combination with the ` key).	Toggle between Normal height and Maximising currently selected track.
Double click on vertical scroll bar	Toggles height of tracks between Minimised, Normal and Maximised.

Tip: If you have redefined the function of the Up and Down arrow keys, as described on the previous page, after maximising any track you can then use these arrow keys to move to the next or previous track. This can be very useful when you are editing waveforms or other media.

Zooming In and Out with the Keyboard

The following keyboard shortcuts can be used for zooming within a project:

Keystroke	Default Function
Page Down	Zoom Out vertically
Page Up	Zoom In vertically
Ctrl Num Pad +	Zoom to current selection
Ctrl Page Down	Zoom Out to entire project length
- (the minus sign)	Zoom Out horizontal
+ (the plus sign)	Zoom In horizontal
Shift Up	Zoom In media peaks
Shift Down	Zoom Out media peaks

Scrolling In and Out with the Keyboard

The following keyboard shortcuts can be used for scrolling within a project:

Keystroke	Default Function
Alt Down	Scroll View down
Alt Up	Scroll View up
Alt Left	Scroll View left
Alt Right	Scroll View right

Tip: Pressing the **F1** key will cause a complete list of current keyboard shortcut assignments to be displayed, including any shortcuts you have defined yourself.

Tip: If you wish to print a list of all shortcut keys, go to **Options, Preferences** then **Keyboard Control** and click on **View Shortcuts as Printable Searchable Web Page**.

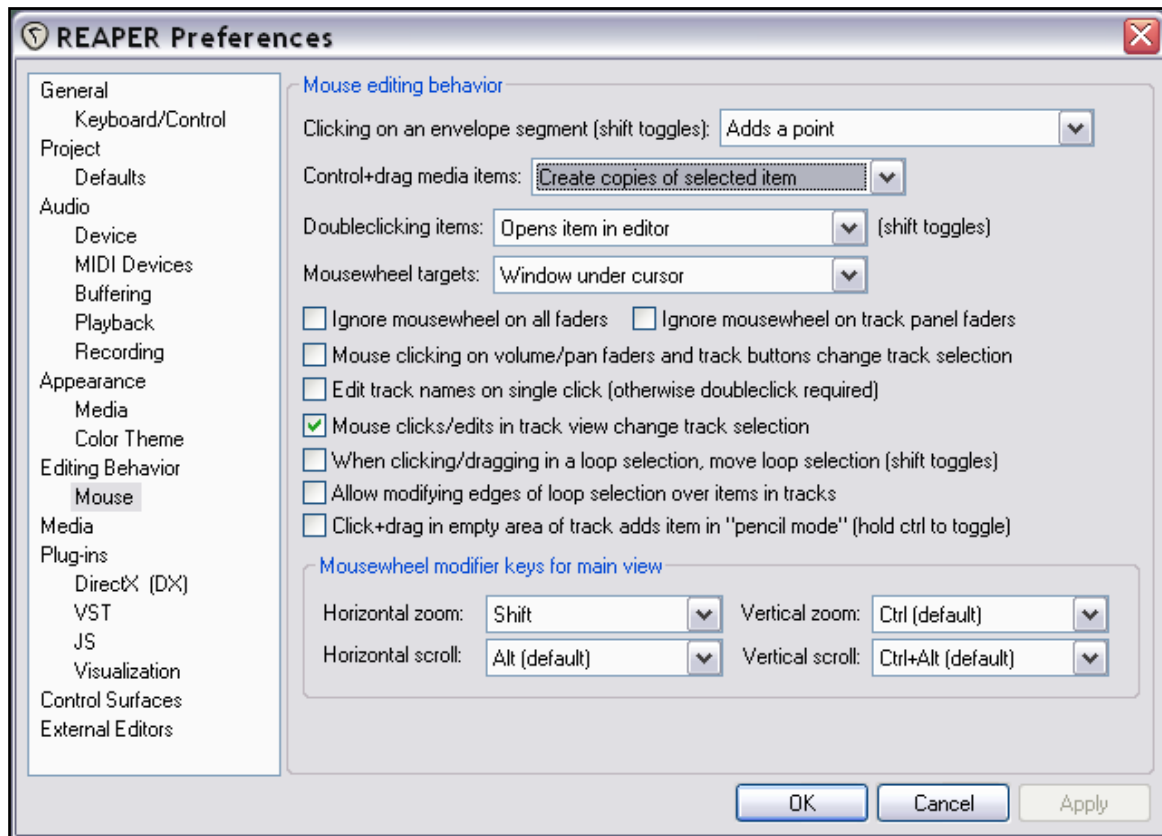
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Zooming and Scrolling with the Mousewheel

The mousewheel can also be used for zooming in and out when you are navigating a project file.

It is recommended that you should check the pre-defined mouse behaviour by going to the **Options, Preferences** dialog box, then selecting **Mouse**.

You can also use this screen to change any of the mouse assignments to suit your own requirements.



In the example shown above, the mouse has been defined, in conjunction with various modifier keys, to behave as follows:

Modifier Key	Behaviour
Shift	Horizontal Zoom
Ctrl	Vertical Zoom
Alt	Horizontal Scroll
Ctrl Alt	Vertical Scroll

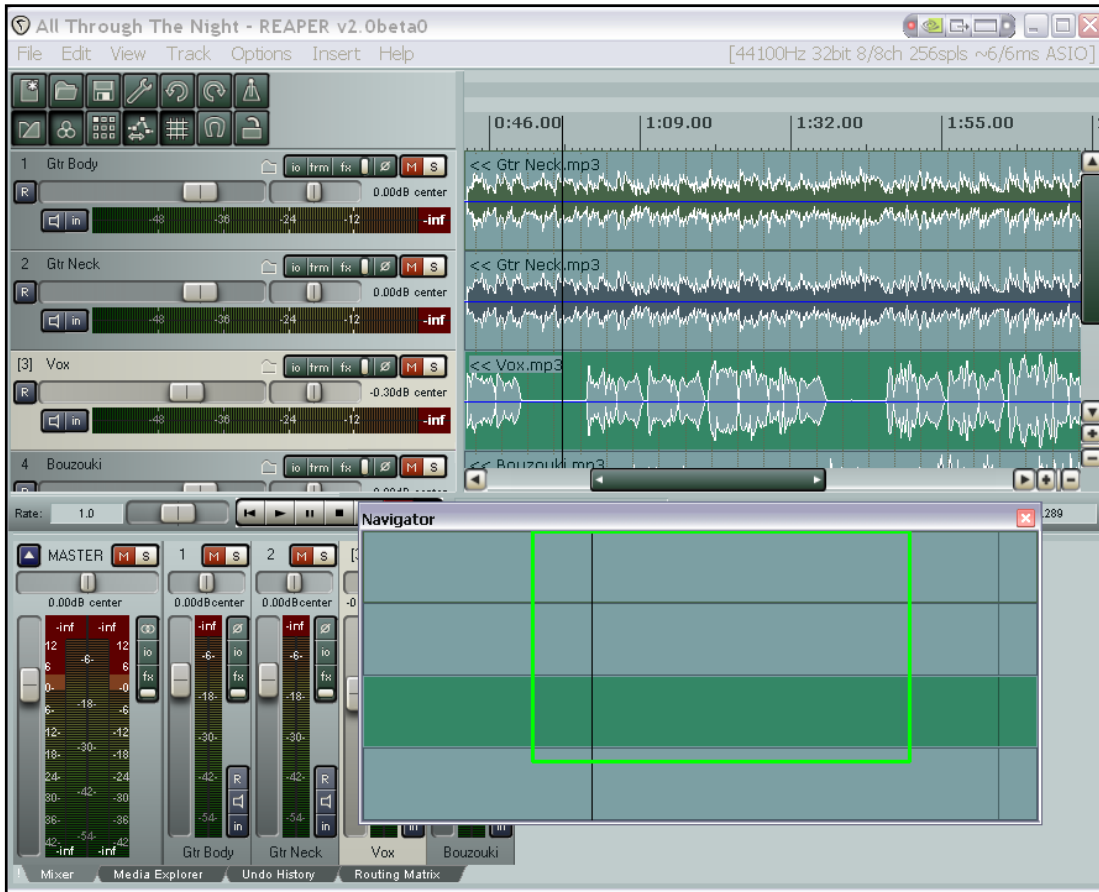
Note: The screen shown above contains a number of other options which enable you to customise your mouse behaviour. These are summarized and explained in Section 15 of this User Guide, Further Customising REAPER.

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2.10 Using the Navigator

The REAPER Navigator shows you an overview of your project. It can be useful to display this when you have zoomed in closely on an area of your project.

To display the Navigator, choose the **View, Show Navigator** command. The keys **Ctrl Alt V** can be used to toggle the Navigator display on and off.



You can also use the Navigator window to scroll through your project.

Simply position the mouse over the box within the navigator window that represents the on-screen area of your project. Then hold down the left mouse button, and click and drag to scroll the display. Release the mouse button when finished. Other ways of using the **Navigator** are:

Method	Result
Hold down right mouse button, click, drag and release	Define new area to be displayed in REAPER workspace.
Left click mouse	Reposition rectangle and workspace display area.
Ctrl Left Click	Reposition and relocate play cursor.
Mousewheel	Use as in workspace to scroll and/or zoom.

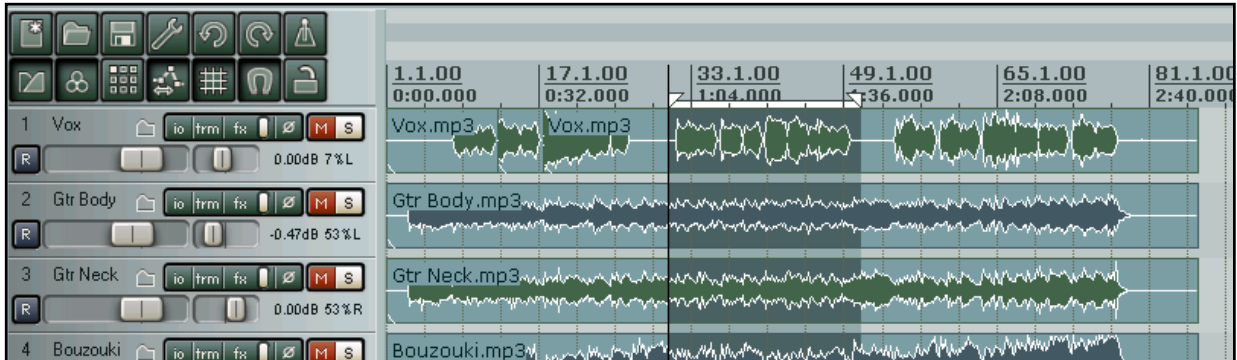
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2.11 Selections and Loops

Often you will want to work with just a part of your project for a while.

In order to do this:

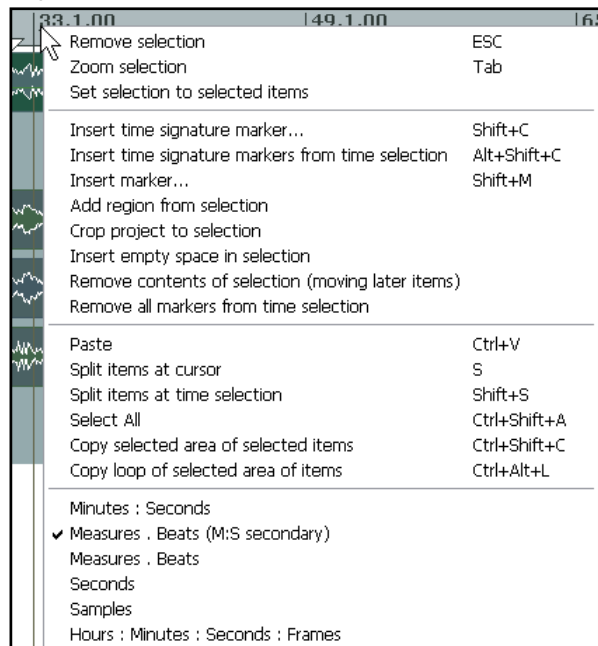
- Stop the playback at or near the point where you want your loop to begin (or click your mouse in the background area to move the Edit Cursor there).



- Place your mouse over the **Timeline** (just above the first track), then click and drag in an empty area of the track view, releasing the mouse to define the exact area that you want to select. The effect of this is illustrated above. *If when you attempt this, the selection snaps outwards to define a larger area than you want, then REAPER has snapping enabled.* Snapping will be discussed in detail in a later section, but for now you can use the shortcut keys **Alt S** to toggle this feature on and off.

Tip: To set the loop selection to match a media item, hold **Ctrl Shift** while you double click on that item.

Now when you play the project, it will replay over again the area selected for your Loop. This is known as the Repeat Function. Note that the start time, finish time and duration of the selection are also shown on the



Transport Bar. Pressing the **R** key toggles this Repeat Function on and off. There is also the option (under **Options, Preferences** on the **Playback** page) to stop playback at the end of a loop when the Repeat Function is disabled.

To change the region defined as your loop, simply repeat the original procedure. To clear the loop altogether, without defining a new one, just press the **Escape** key.

Right clicking on the Timeline gives you a menu of commands you can apply to the Timeline and/or the selection, including **Zoom Selection** and **Remove Selection**. You can also use this menu to change the units used on the timeline – for example, Minutes, Measures, Seconds and Samples (see left).

Other commands on this menu will be discussed elsewhere in this User Guide, as the need arises. These are features that you are likely to find useful when editing your file. You will also be shown how a method similar to that used for defining a loop can also be used to select parts of a track for other functions, such as editing.

Tip: Notice that where a keyboard shortcut is available for any command, that shortcut is displayed on the context menu. You will find that learning the keyboard shortcuts for those features of REAPER that you use most will save you a lot of time.

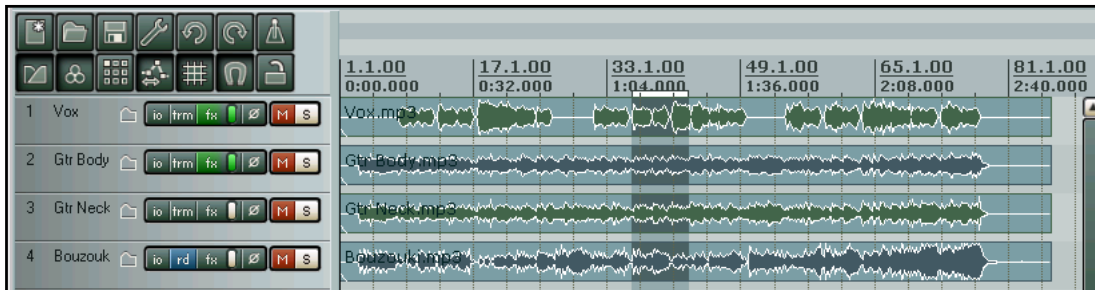
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2.12 Zoom To and From Time Selection

When working with selections, REAPER's behaviour will vary depending on whether (within the **Options** menu) you have **Loop points linked to time selection** selected or not. If this option is off, you should make your selection by dragging in an empty area of the track pane if you wish to leave your loop selection unchanged. If the option is on, you can drag either in an empty area of the track view or along the timeline, as you wish. The examples that follow assume that the option **Loop points linked to time selection** is **on**.

To zoom in on a selected area of a project:

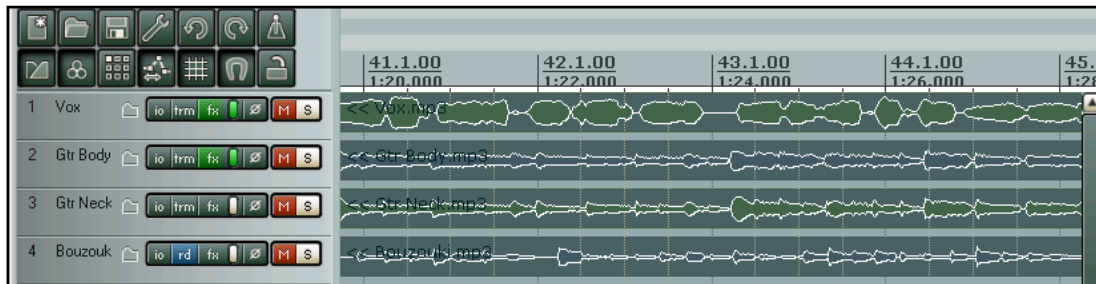
1. Click and drag the mouse along an empty space within the track area to mark the selection (see below).



2. Press **Ctrl Num Pad +**
3. If you wish, press **Esc** to remove the selection.

To zoom out from a selected area to view entire project length:

1. Hover the mouse just above the timeline, so that the mouse indicator changes to a hand.
2. Double-click to select the entire project timeline (see below).

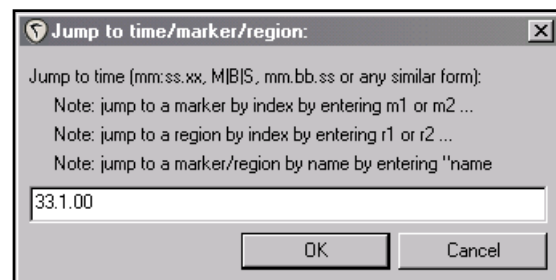


3. Press **Ctrl Num Pad +**
4. If you wish, press **Esc** to remove the selection.

Navigating by Jumping

You can jump to any point along the timeline using the **View, Jump To** command, or by pressing the keyboard shortcut for this command, **Ctrl J**. In specifying the location to jump to, you should use the same format as is used on the timeline.

In the example above, the timeline displays Measures and below it Minutes and Seconds. You could therefore use either format, e.g. **33.1** or **1:04**.



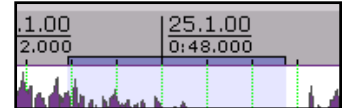
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2.13 Managing Time and Loop Selections

In the last section you learnt how to use your mouse to click and drag within an empty area of the track view to define a time selection. This may or may not also change the loop selection, depending on your **Options, Looped points linked to time selection** setting. As you progress through this User Guide, you will come to see that time selection plays an important role in REAPER, for example when it comes to editing your media items.

You'll probably find at first that it's too easy to make a mistake with the mouse. You can find yourself perhaps selecting too large an area, or else missing part of the area that you intended to select.

To modify a loop selection using the mouse, hover the mouse over the edge at the start or finish of the loop selection on the time line, then click and drag left or right. Dragging left from the start of the selected area extends the selection left, dragging right shortens it. Dragging right from the finish of the selected area extends it to the right, dragging left shortens it.



To move a loop selection, hold the mouse over the selected area on the time line, then hold down **Shift** while clicking and dragging the mouse left or right.

There are also several keyboard shortcuts you can use for managing **Time Selections**, summarised below. If looped points are linked to the time selection, then the loop area will also be modified.

Keystroke	Default Function
, (comma)	Nudge Entire Time Selection left a little.
. (period or full stop)	Nudge Entire Time Selection right a little.
Ctrl ,	Extend Time Selection to left by nudging left edge left a little.
Ctrl .	Extend Time Selection to right by nudging right edge right a little.
Ctrl Alt ,	Shrink Time Selection from right by nudging right edge left a little.
Ctrl Alt .	Shrink Time Selection from left by nudging left edge right a little.
Shift ,	Move Time Selection left by time selection length.
Shift .	Move Time Selection right by time selection length.
Ctrl Shift C	Copy portions of selected media items in Time Selection.
Esc	Remove Time Selection.

In addition, if you wish you can use the keyboard rather than the mouse to define your time selection in the first place. First you need to position the cursor at either the start or the end of the loop, then use one of these:

Keystroke	Default Function
Shift Left Arrow	Drag cursor to the left and create time selection.
Shift Right Arrow	Drag cursor to the right and create time selection.

The following keystrokes can be used to zoom when you are working with a time selection:

Keystroke	Default Function
Ctrl PageUp	Zoom to Time Selection.
Ctrl PageDown	Zoom back to Project.

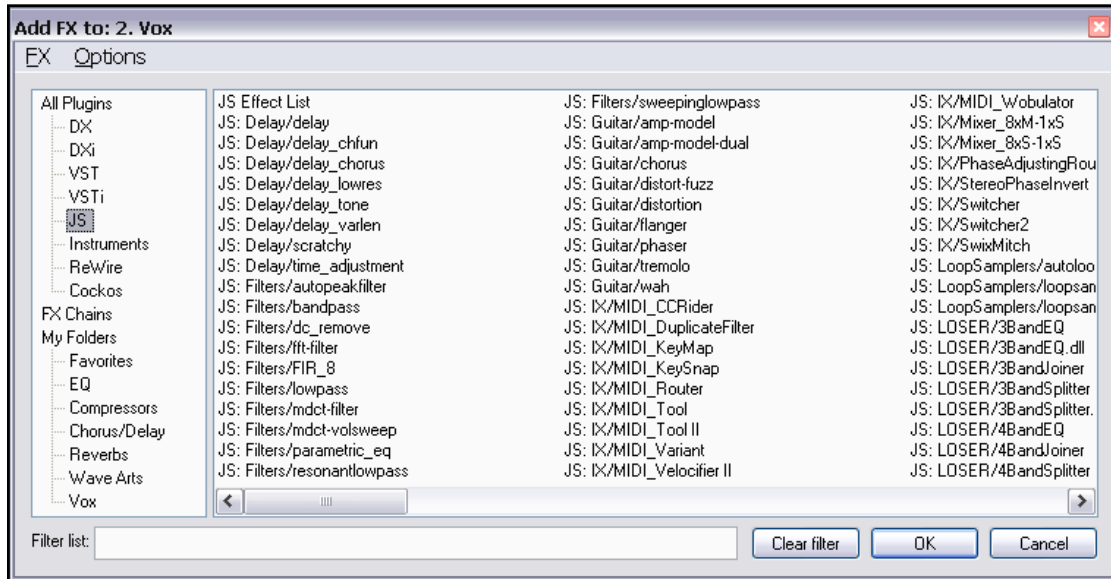
Tip: If you are unable to position your cursor exactly where you wish when creating a loop selection, it may be that you have snapping enabled. **Alt S** will toggle snapping status on and off.

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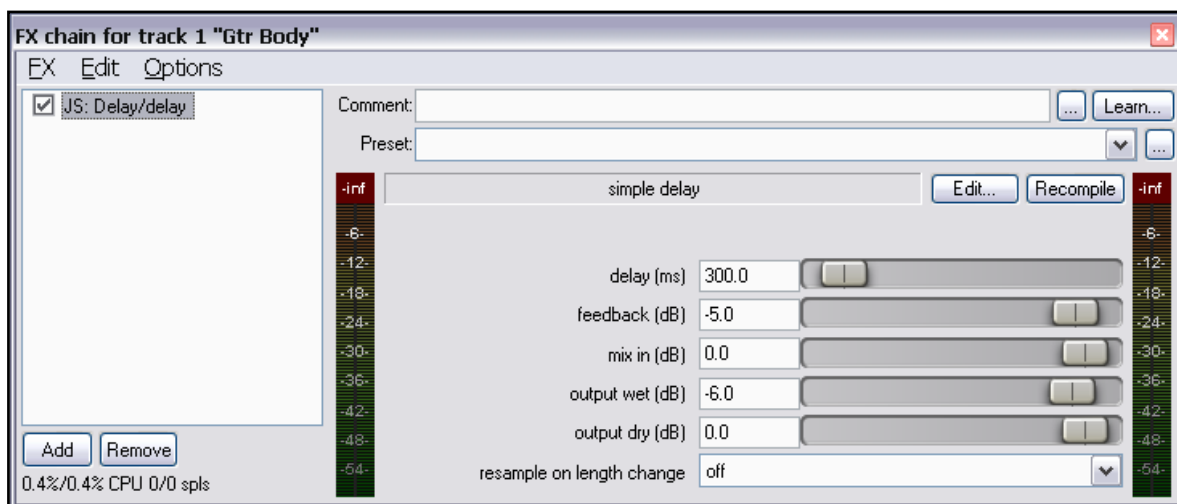
2.14 Track FX Basics

Track FX (VST and Direct X as well as VSTi and DXi) can be added to any track by directly inserting the FX into the FX Window for the required track. In some programs, these are known as *track inserts*.

A good selection of Track FX is supplied with REAPER, including Jesusonic and Cockos effects. To do this, simply follow this procedure:



1. Click on the FX Button in the Track Control Pane of the track to which you want to add the FX. This causes the Add FX window for that track to be displayed.
2. Select a category, e.g. All Plug-ins, Direct X, VST, Jesusonic. This causes all available FX in that category to be listed.
3. Double click on the required FX.
4. To add more FX, click on the **Add** button within the Track FX window, then repeat steps 2 and 3 above.

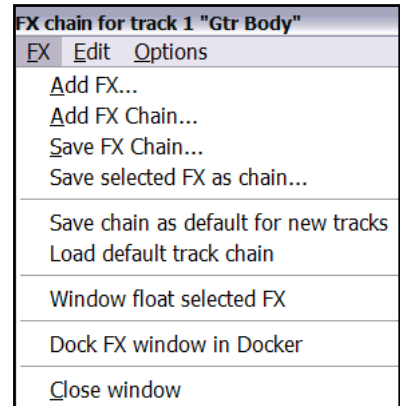


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2.15 Controlling Track FX

REAPER provides you with a number of tools to help you manage your Track FX. For example, you can:

- Change the order in which they are applied.
- Copy or move any FX from one track to another.
- Save (and retrieve) any sequence of FX as a chain that can be easily inserted into other tracks.
- Bypass individual FX or an entire FX chain.
- Specify a default set of FX to be automatically inserted into new tracks for your project.



Task	Method
Adjust the values for Track FX parameters	Drag with the mouse, or scroll the mouse wheel over, the fader that controls the value of the parameter that you wish to change.
Change Track FX Order for a track	Drag and drop the FX Name up or down within the Track FX window.
Copy an FX from one track to another.	Hold down Ctrl , drag the FX from the source track FX window and drop on the FX button for any other track.
Move an FX from one track to another.	Hold down Alt Shift , drag the FX from the source track FX window and drop on the FX button for any other track.
Bypass an FX	Untick the check box to the left of the FX name within the Track FX window.
Remove an FX from a track	Select the FX name within the Track FX window then click on the Remove button.
Remove all FX from a track	Hold Alt while clicking on the track's FX button in the Track Control Panel.
Save the current sequence of Track FX as a chain	In the Track FX window, choose the FX, Save FX Chain command. Current FX parameter settings are saved with the chain.
Save selected Track FX as a chain	Select the names of the FX to be included in the chain (use Ctrl key while clicking the mouse), then choose FX, Save Selected FX as Chain
Make the current Track FX the default for new tracks	Within the Track FX window, choose FX, Save Chain as default for new tracks .
Retrieve an existing previously saved FX Chain	Within the Track FX window, choose FX, Add FX Chain command.
Access the FX Preferences settings	Within the Track FX window, choose the Options, FX Plug-in Settings command.
Bypass all FX for a track	In the Track Control Pane, click on the FX Enable/Disable toggle button. Click again to reverse this.



Tip: The **FX Enable/Disable** toggle can be assigned a keyboard shortcut. Choose the **Options, Preferences** command and go to the **Keyboard Control** screen. Click on the **New** button, then press the shortcut key of your choice (for example, **B**), display the **Action** drop down list, then scroll down to select **Track: Toggle All FX Bypass** then click on **OK**. Click again on **OK** to close the Preferences window.

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2.16 Creating a Default FX Chain

If you have used other DAW software such as Sonar, you might be used to having an EQ Plug-In automatically inserted for you in every track. REAPER allows you to do this by creating a default FX chain which is then automatically applied to every new track that you create. Of course, this default chain can contain any FX that you wish.

To do this, you simply follow this procedure:

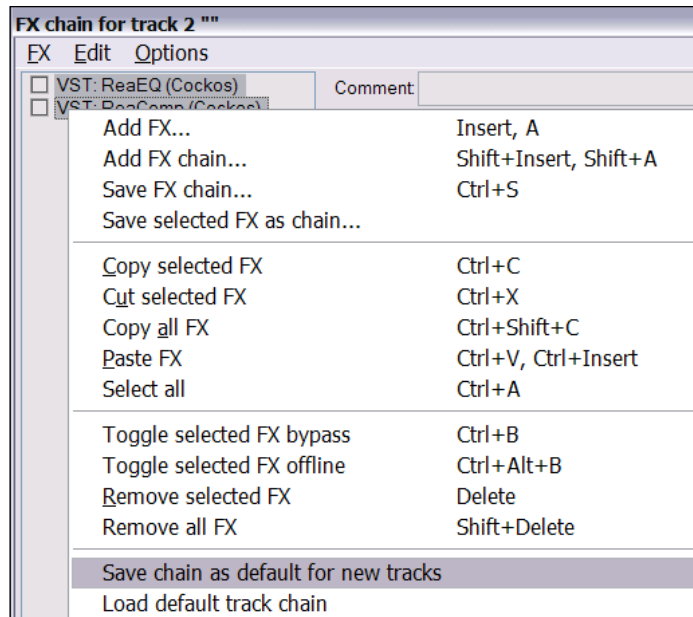
- Open the FX Window for any track.
- Add the FX required.
- With the FX selected, right click and choose **Save chain as default for all new tracks** from the menu.

Tip: If you switch the FX to bypass mode before saving your FX chain, then the FX chain will be saved in bypass mode. This means that the FX in your new tracks will not require any CPU usage until such time as you open the FX window and enable them.

Example

In this example, we will create a default FX chain that consists of ReaEQ and ReaComp, both set to bypass mode.

1. Open any project file and add a new track at the end. We will use this track to create our FX chain.
2. Click on the **FX** button for this track to open the FX Window.
3. Use the **Add** button to add, in turn, first **ReaEQ (Cockos)** and then **ReaComp (Cockos)**.
4. Make sure that both these FX are unticked – this sets them to bypass.
5. Select both these two FX.
6. Right click over the selection and from the context menu choose **Save chain as default for new tracks** (see right).
7. Close the FX window
8. You can now exit REAPER if you wish. There is no need to save the changes to the project file.
9. Re-open REAPER and open any project file.
10. Insert a new track anywhere you wish in this project file.
11. Open the FX window for your new tracks. You should see that the two plug-ins, ReaEQ and ReaComp have already been inserted into this FX bin, in bypass mode.



Tip: If you wish to make changes to the contents of your default FX chain, simply repeat the process described above, this time with the changed set of plug-ins.

Tip: If you hold down the **Ctrl Shift** keys when opening a project file then the file will be opened with all FX set off line. This can be useful if you need to conserve CPU, or if there is a plug-in which might be causing problems.

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2.17 Using an FX Bus

If you have used other DAW software, or an analog (tape) recording and mixing desk, you are probably already familiar with the concept of a **Bus**. The exact meaning of the term can have several variations, but most commonly (and in this example), a Bus is used to enable a number of tracks to share the same resource (such as perhaps Reverb or Chorus FX).

This saves on valuable computer resources such as CPU. For example, instead of requiring multiple instances of the same FX in perhaps three or four tracks or more, by using a Bus you can ensure that only one instance of the FX is required.

Note that when you use a Bus in this way:

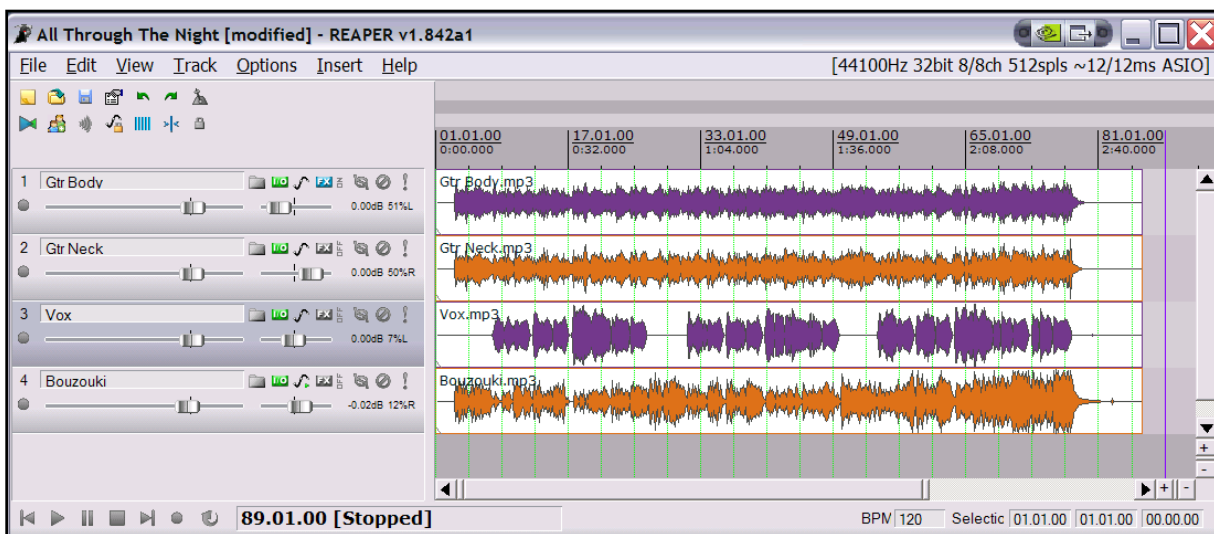
- The output of each track is still directed to the Master, as in the earlier example that we examined in Section 1.
- In addition, a portion of the signal from each track is directed to the FX Bus.
- At some stage, the output of the FX Bus is then mixed back in with the original signal. Typically (and in the example shown here) this is achieved by directing the output of the FX Bus to the Master, although other more complex routing arrangements are also possible.

The Bus can be inserted anywhere in the project that you like. In this example, we will be inserting it just above the first track.

This example uses the sample project file **All Through The Night.RPP**. You might wish to open this file, then save a copy to a new name such as **All Through the Night with Bus.RPP** before embarking on this example.

In this example, we are going to create an FX Bus and insert into that bus a Chorus effect. We will then ensure that both of our guitar tracks use the chorus. You will see that REAPER is different from other audio software in that it makes no inherent distinction between a Bus and a Track. The difference is determined solely by how you use it.

Notice that the illustration below shows that for a more pleasing sound, the guitar tracks have been panned somewhat to the left and right respectively.



Note: This illustration, like many of the others that follow, uses the Classic colour theme rather than the REAPER default colour scheme.

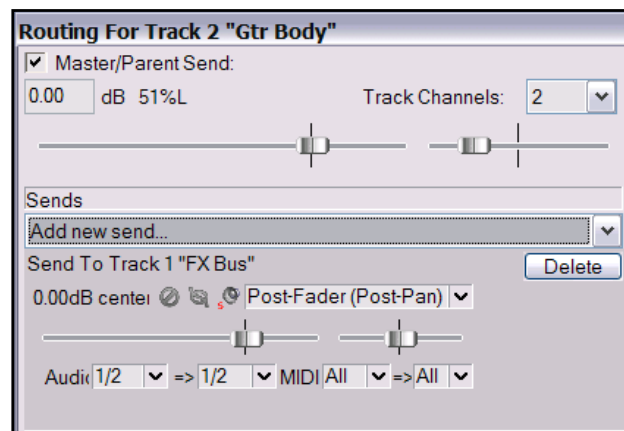
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To Create the Bus and add the FX to it:

1. Select Track 1 (in the Track Panel).
2. To insert a new track either choose the **Track, Add New Track** command, or simply press **Ctrl T**. See above. Depending on which version of REAPER you are using, this may be inserted above or below the current track. If it is inserted below the selected track, position the mouse over the track number for the new track, then drag it up so that it becomes Track 1.
3. To name this new track, click in the area where the name is to go, type **FX Bus** then press **Enter**.
4. To insert the Chorus FX into this bus, click on the bus's **FX** button. From the list of plug-in types, select Jesusonic, then in the list of plug-ins double click on JS: Guitar/Chorus. Close the Bus FX window.

To Create Sends from the Tracks to the Bus:

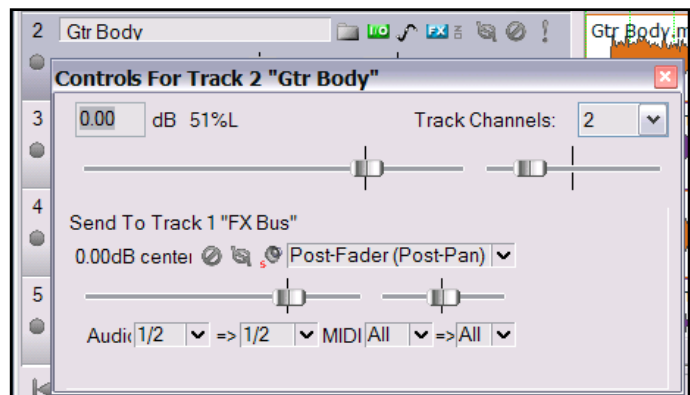
5. What was originally Track 1 has now become Track 2. Select this track.
6. Display the Inputs and Outputs for this track. To do this, click on the **I/O** button.
7. Click on the **Add New Send** drop down arrow to display a track list, then click on **1: Fx Bus**. Your Input/Output window for this track should now be similar to that shown (right), with Volume and Pan faders for your Send.
8. Adjust the Volume fader for this send to about -10db (as shown on the right). With practice and experience you will develop a feel for what is a sensible level to use. Close this Window. Now select Track 3 and repeat steps 6., 7. and 8.



Making Adjustments

When you now play the song, you'll probably find that there's more chorus on the guitar tracks than you would like. There are four ways to adjust this. You will need to experiment until you find what gives you the results you want:

1. Adjust the FX parameters in the FX window for the bus. In this case, you could lower the amount of Wet signal in the mix.
2. Adjust the Send levels for each of the two guitar tracks. To do this, for each track in turn, right click over the track's volume fader. This causes a window to be displayed (similar to that shown on the right) which includes all of the Volume and Pan controls for that track.
3. Display the Routing Settings for the FX Bus and adjust the Receive levels for either or both of the two Guitar tracks.
4. Adjust output volume fader for the track called **FX Bus**.

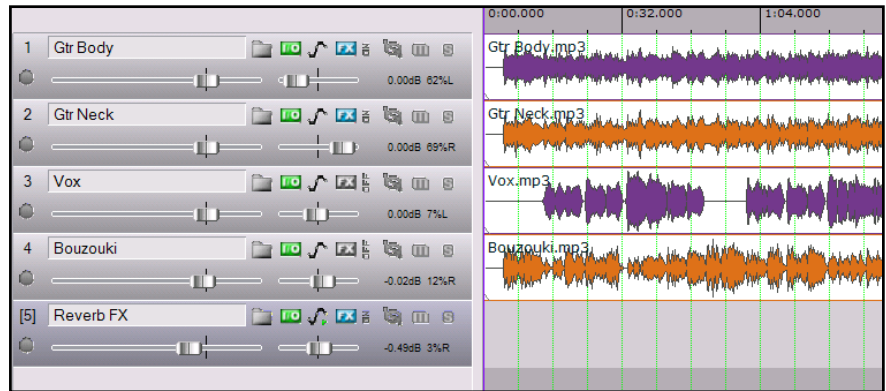


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2.18 Sending Multiple Tracks to an FX Bus

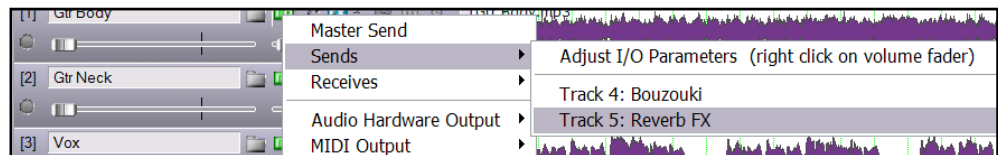
There will be times when you will want to create sends for several tracks, all to the same FX Bus. For example, take a look at the project below:

In this example, we might want to create a send to Track 5 Reverb FX from each of the tracks 1 to 3. To do this, you can follow this sequence. Of course, you could do this as three separate actions – but there is a quicker way:

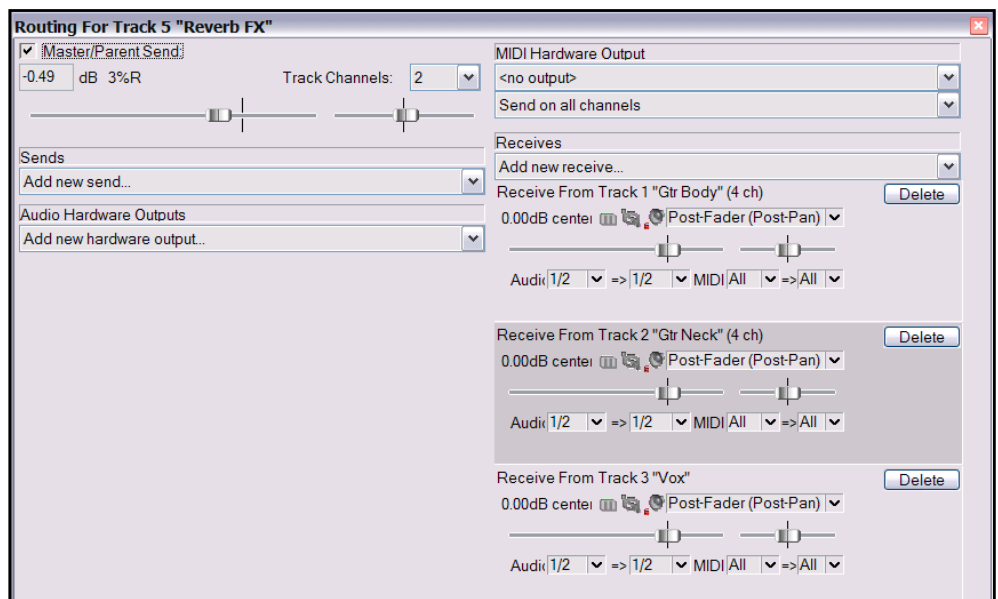


1. To select Track 1, click the mouse on the Track Number for this track.
2. Holding down the **Shift** key, click the mouse on the Track number for Track 3. This selects everything from Tracks 1 to 3 inclusive. Notice that these track numbers are now enclosed in square brackets.

3. Right click over the **I/O** button for any of the selected tracks. From the context menu, choose **Sends** then **Track 5: Reverb FX**.



4. Display the **FX Window** for **Track 5 Reverb FX** and add a reverb plug-in of your choice. You can use the Cockos Reverb, or any other that you have



available. One to try might be **Glaceverb**, available free at <http://www.dasample.com>

5. Adjust your reverb settings to suit, or select a preset if any are available. You may now wish to adjust the send levels for each of the three sends that you have just created. Click on the **I/O** button for the **Reverb FX** track. You can use I/O Window for this track to adjust the levels of each of the receives shown there. Note that each receive shown here corresponds to one of the sends.

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2.19 Monitoring FX Performance

The various plug-ins that you have at your disposal can certainly help (if used wisely) to bring your mixes to life. The only downside is that they can impose quite a heavy overload on your computer's CPU. To help you overcome this problem, 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, Show Performance Meter** command.

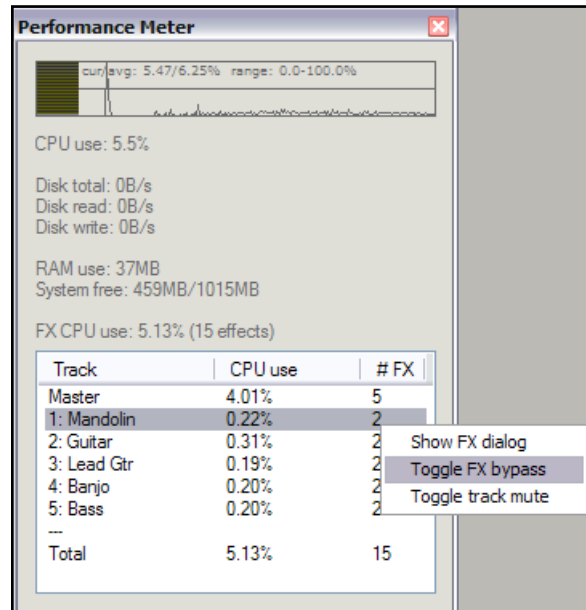
Example

In the example shown (above right), you can see that our project is running at around 50% CPU overall, and that Track 8 is using over 13% of the available CPU.

In this case, you might wish to examine this track more carefully, especially if your project was running closer to CPU capacity.

The first thing you could do is toggle on and on the FX for this track, to enable you to hear exactly what the FX on this track is doing.

To do this, just right click over the Track number in the Performance Meter window and choose **Toggle FX bypass** (see right).



To examine the FX in this track more closely, simply double-click on the track number in the Performance Meter window. This will cause the FX Window for that track to be opened. This feature is especially useful if you have a large number of tracks in your project. You can use the Performance Meter window to browse through your project file, checking it track by track, without having to scroll or navigate through Track View.

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

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

Note: You can find [more information about the REAPER Performance Meter](#) in Section 15 of this guide, *Further Customising REAPER*.

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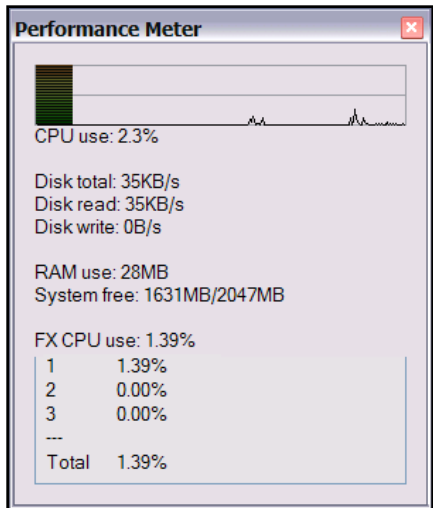
2.20 REAPER Views and Windows

You have already been introduced to working with a number of Windows open in REAPER – for example, the Mixer, the Big Clock, the FX Browser, the Navigator and the Transport.

One glance at the **View** menu will show you that there are several other windows that you may use when working with REAPER.

In this section, we will be looking at:

- The Performance Meter: this indicates how much of your PC's resources (such as CPU and RAM) is currently available.
- The Routing Matrix: this presents you with a handy overview of which tracks are routed to where, including any sends that you may have created.



View	Track	Options	Insert	Help
✓ Show Docker				Alt+D
✓ Show Transport				Ctrl+Alt+T
✓ Show Mixer				Ctrl+M
✓ Show Undo History				Ctrl+Alt+Z
✓ Show Performance Meter				Ctrl+Alt+P
✓ Show Routing Matrix				Alt+R
Show Navigator				Ctrl+Alt+V
✓ Show Big Clock				Alt+C
Show FX Browser				Shift+F
Show Virtual MIDI Keyboard				Alt+B
Show Screen Sets				Ctrl+E
✓ Show Media Explorer				Ctrl+Alt+X
Show Video Window				Ctrl+Shift+V
Show Master Track				Ctrl+Alt+M

To toggle the display of the Performance Meter, use **Ctrl Alt P**

To toggle the display of the Routing Matrix, use **Alt R**

The Performance Meter

Press **Ctrl Alt P** to view the performance meter (see left).

Play the project, and observe the behaviour of this Performance meter. Right clicking over this window displays its settings menu.

The Routing Matrix

The more accomplished you become

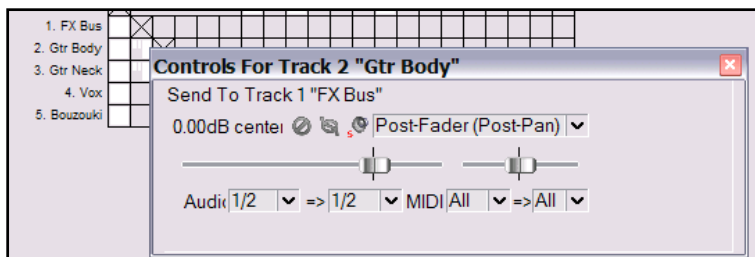
at using REAPER's routing capabilities, the more useful you will find the Routing Matrix.

Press **Alt R** to display the routing matrix. For the project file **All Through The Night with Bus** it should resemble that shown right (although of course your actual Record Inputs may not be the same).

In the example shown, the bottom three rows – labelled Left, Right and Left + Right represent recording inputs. [This topic will be covered later](#) in Section 3.

This matrix isn't just for show. You can use it to make changes to your faders, for example, send levels and panning. This can be an especially convenient way of working if a project file has many tracks.

	master/parent	1. FX Bus	2. Gtr Body	3. Gtr Neck	4. Vox	5. Bouzouki	Phones L + Phones	Phones R + 3 Out	3 Out + 4 Out	4 Out + 5 Out
master output	✓									
1. FX Bus		✓								
2. Gtr Body			✓							
3. Gtr Neck				✓						
4. Vox					✓					
5. Bouzouki						✓				



For example, observe the cell in the matrix where the **Gtr Body** row intersects with the **FX Bus** column. This cell contains two small blobs.

By right clicking over this cell, you can cause the controls to be displayed which determine how the signal from the Gtr Body track is sent to the FX Bus (see illustration left).

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2.21 Simplifying the Routing Matrix Display

If your sound card has multiple outputs, then by default, REAPER's Routing Matrix will display multiple permutations of paired outputs, including several that you may feel that you do not need.

Consider the example on the right, which uses output channel name aliasing.

This matrix shows a setup which uses a sound card with eight outputs. Outputs 1 and 2 are directed to Speakers, outputs 3 and 4 to Headphones, whilst the remaining four outputs are currently unassigned.

Notice that in cases like this, the Routing Matrix includes combinations that you are unlikely to wish to choose, such as **Speaker R + Phones L**.

If you wish, you can prevent these from being displayed by choosing the **Options, Preferences** command, then selecting the **Audio** settings page.

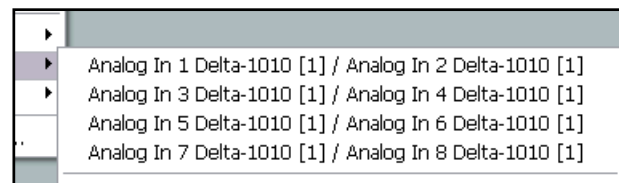
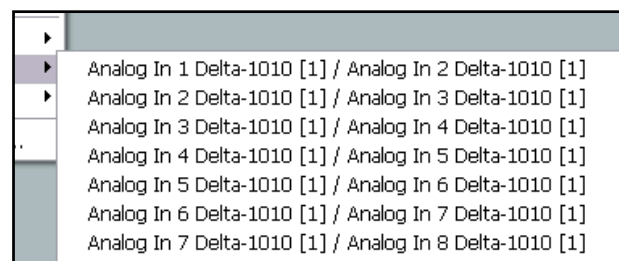
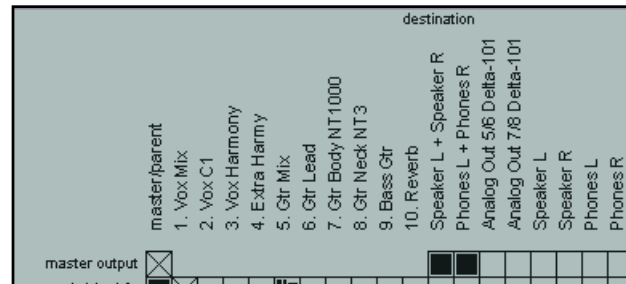
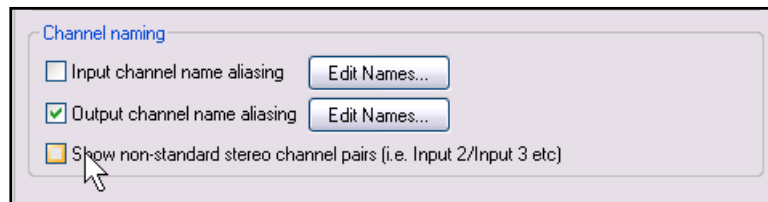
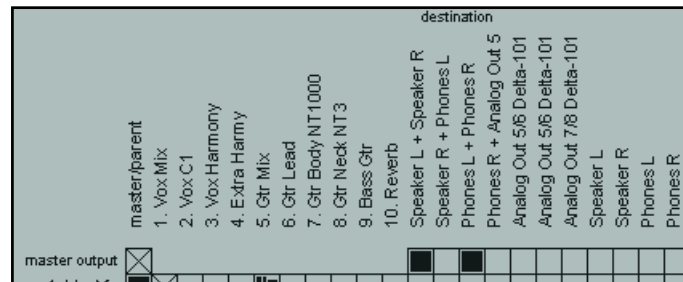
This includes a **Channel naming** section, where you can turn off the option to **Show non-standard stereo channel pairs**.

The effect of turning off this option is shown in the illustration on the right. Notice that if for some reason you did wish to direct your output to (in this example) Speaker L and Phones R, you could still do so by selecting each of these outputs individually on the matrix.

Turning off the display of non-standard stereo channel pairs can also make life a little easier for you when you are recording from paired inputs.

The topic of recording in REAPER will be dealt with in the next section of this User Guide, but, in short the same principle applies. For the most part, it is unlikely that you will wish to record a track using a non-paired stereo input.

By turning off the display of non-standard stereo channels, you will ensure that when selecting paired inputs for a stereo track, the list of options offered to you will look more like the second of the two examples shown than the first one.



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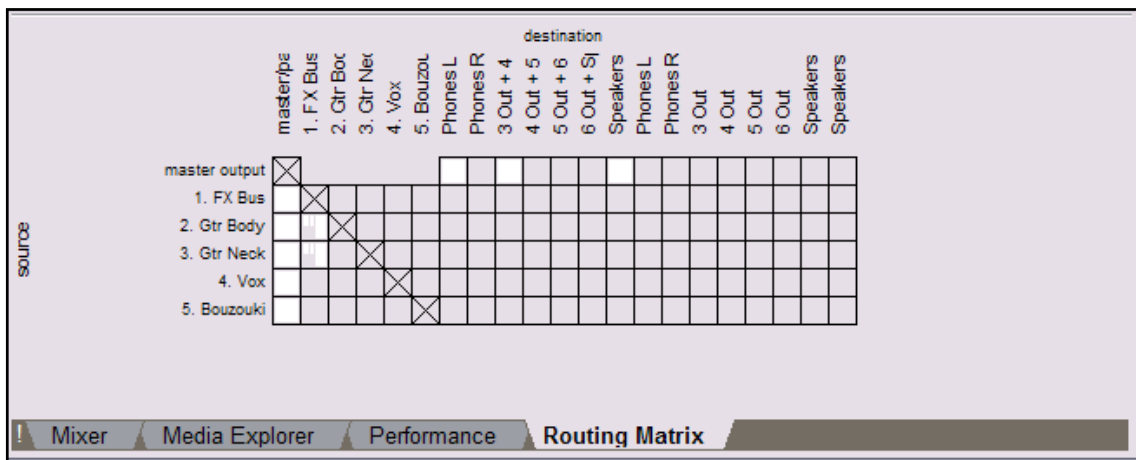
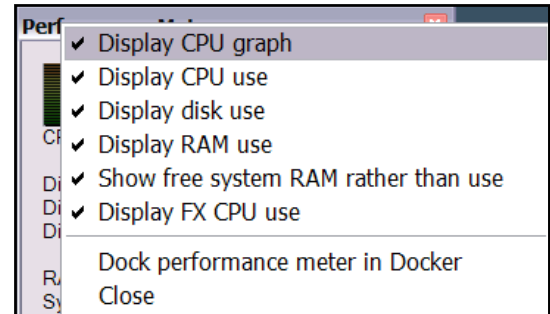
2.22 Docking and Floating

Too many views on the screen at once creates too much clutter. That's when the Docker becomes useful.

Right clicking over the title bar or background area of any window will cause a context menu to be displayed which will offer a list of choices relevant to that window. In many cases, their purpose will be obvious.

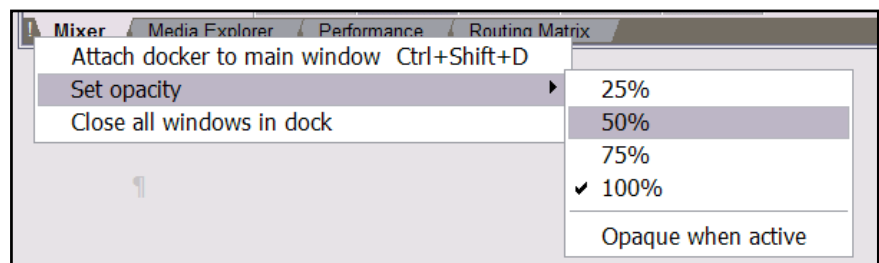
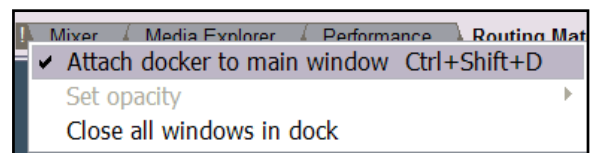
This menu will include the option to **Dock Window in Docker**.

When a series of windows are all docked, at the foot of the Docker you will see a series of Tabs, which are used to select which item is displayed by the Docker at any time:



Notice also that:

- If you close a Window, next time it opens its docking status will be the same as when it was closed. That is, if a Window is docked when it is closed, next time it is opened it will still be docked.
- To undock a window, right click the mouse over the background or tab area of the window and deselect the **Dock Window in Docker** option.
- The Docker can itself be detached and floated. Right click over the small exclamation mark in the bottom left corner of the Docker and deselect the option to **Attach Docker to Main Window** (see above).
- Right clicking over the same small exclamation mark after detaching the Docker from the Main Menu will also give you access to the **Set Opacity** feature. This can be used to ensure that when floated and not in focus, the Docker is transparent.



Tip: The keyboard shortcut **Alt D** can be used as a toggle to show or hide the Docker.

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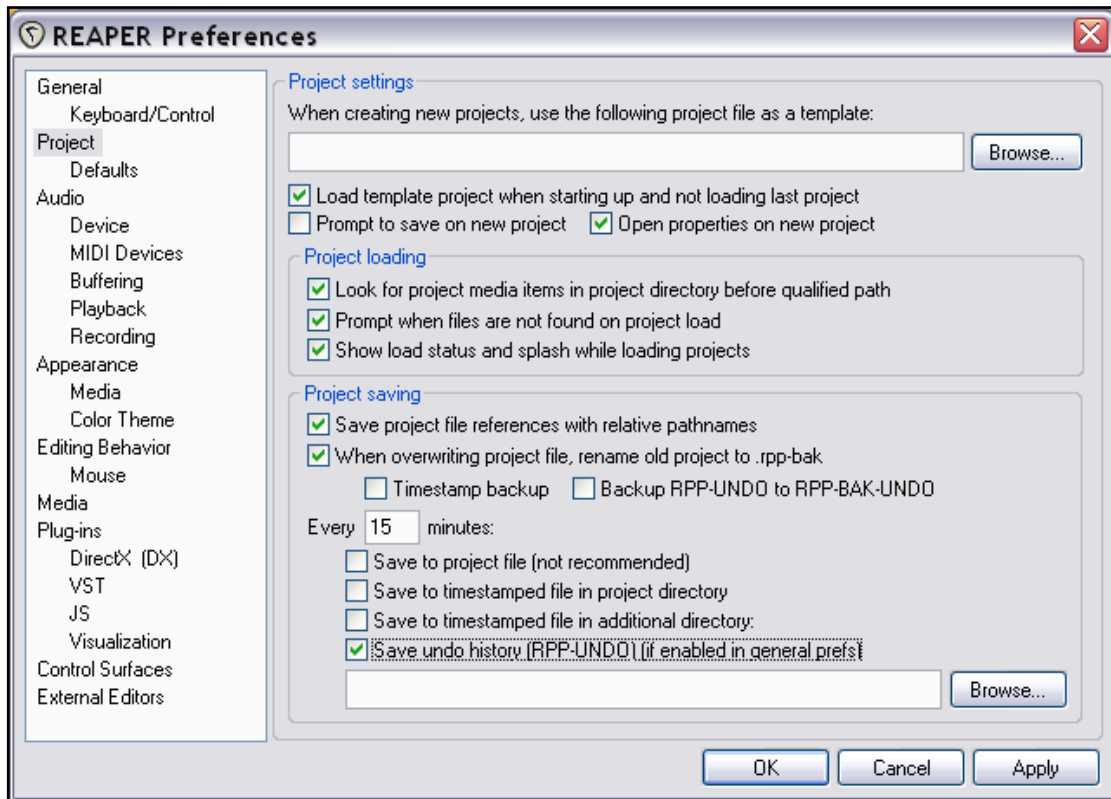
3 Recording With REAPER

This chapter will take you through everything you need to know to get started with recording in REAPER. At the end of the chapter, you will find a helpful checklist.

3.1 Creating a New Project

To create a new project file, you can either use the **File, New Project** command, or press **Ctrl N**.

The **Project** page within the **Options, Preferences** dialog box can be used to determine how REAPER behaves each time you create a new project:



Amongst the most useful options on this screen are the following:

- **Specify a template file for project.** This enables you to create a project with, for example, tracks, buses and routing already set up for you in your preferred fashion. This feature will be covered in detail later in this section.
- **Open properties on new project.** If this option is selected, the **Project Options** dialog box will automatically be displayed every time you create a new project. This can help ensure that you select the correct recording format and other settings that you require.
- **Automatically create a backup each time your file is saved and overwritten.** This helps protect you against accidental loss of work.
- **Automatically save to a timestamped file at intervals you specify.** This can help to protect you from the consequences of an unforeseen circumstance such as a power outage or a computer crash.

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3.2 Saving the Project File

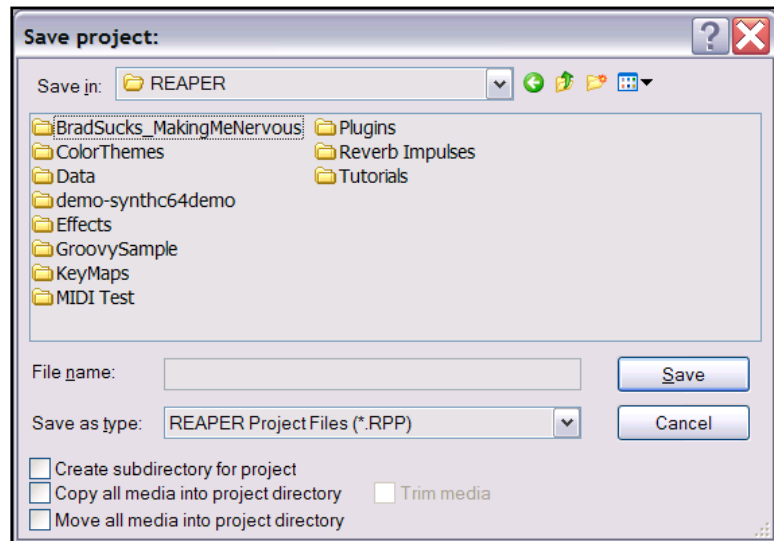
As soon as you have created your file, it is a good idea to save it, using the **File, Save Project** command, or the keyboard shortcut **Ctrl S**.

You will need to specify a name for your project file.

If you select the options to **Create subdirectory for project** and **Move all media into project directory** (see right), the project and all its media files will automatically be saved into their own folder.

You should also make sure that you get into the habit of frequently resaving your project after making changes.

The easiest way to do this is simply to press **Ctrl S**.



3.3 Creating and Naming Tracks

Assuming that you have created a new empty project file, the next thing you will want to do is to create a track or a number of tracks for recording.

A project can contain as many or as few tracks as you want. You can add tracks using the **Track, Add Track** command or by pressing **Ctrl T**. Depending on which version of REAPER you are using, the new track will either be inserted immediately before or immediately after the currently selected one.

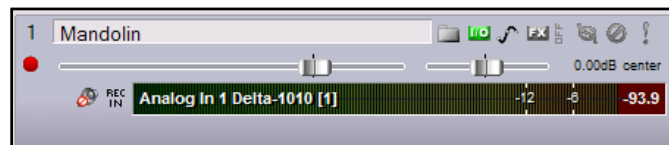
It is advisable to name the tracks before you start recording. To do this, double-click in the track name area and type the name. This ensures that the Wave (or MP3, or whatever) file that is created when you record will be given a sensible name that matches the track. Note that under **Options, Preferences** you can display the **Recording** settings page and decide which items are automatically included in your track's file names. These can be any combination of Track Index (number), Track Name, and the time of the recording.



REAPER supports multitrack recording. The number of different sources that you can record at the same time is limited by the number of inputs on your audio device or soundcard.

Before commencing recording, for each track you will need to:

- Arm the track for recording.
- Assign the Input that is being used.
- Check that the sound level is right for recording.



Optionally, you may also:

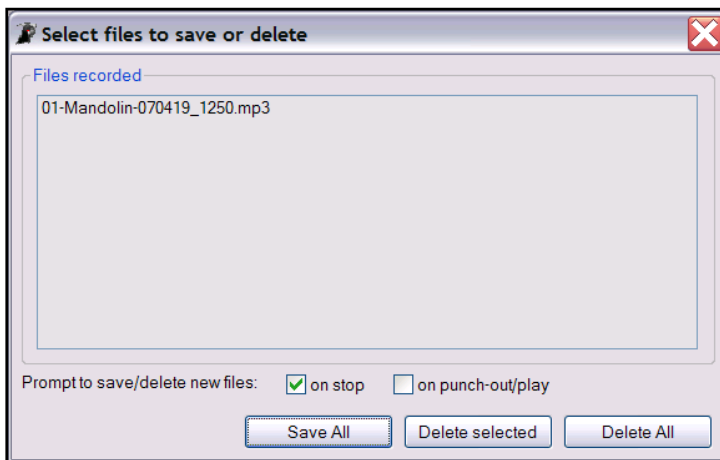
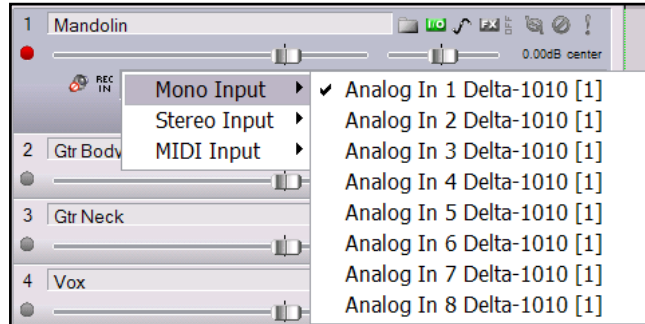
- Select a recording format other than the default
- Turn input monitoring on.

Note: You do not need to specify when creating a track whether it is to be a Stereo or Mono track. Notice, however, that when assigning the track input for recording, that can be either a single mono input or a stereo pair.

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3.4 To Prepare and Record One Track

1. Choose the **Options, Record mode: Normal** command to make sure that **Record Mode** is set to **Normal**.
2. Click on the **Record Arm** button for that track (it's just below the track number). This will cause the track's VU meter to be displayed.
3. Click the mouse over the left hand end of the VU meter for that track. This displays a menu (right). The exact options on that menu will depend on which sound card and audio device(s) you have installed.
4. Select the required input from the menu. This will be the one to which the microphone or line that you are using for recording is connected. In most cases, this will be a **Mono Input**.
5. Audition the sound while you adjust the volume on your audio desk or sound input device, so as to get a good strong signal without clipping. If in doubt, aim to peak at about -10dB . *Note that the recording level cannot be controlled by adjusting the Track's volume fader: that controls only the playback level.*
6. Press the **Record** button on the **Transport**, or use the keyboard shortcut **Ctrl R**.
7. To finish recording, either press **Stop** on the Transport, or press **Space**, or press the **Record** button again, or press **Ctrl R**. Now click on the **Record Arm** button for this track to "disarm" it.



Note 1: if you stop recording by pressing the **Record** button or with **Ctrl R**, the recorded media are automatically saved.

If you press **Space** or **Stop** a dialog box will be displayed which offers you the opportunity to save or delete any of your recordings (see left).

This can be useful, for example, if you have armed and recorded more tracks than you intended.

Note 2: REAPER supports "on the fly recording". This means that you can also arm additional tracks after the recording has started. Those tracks will then also be recorded.

3.5 To Prepare and Record Multiple Tracks

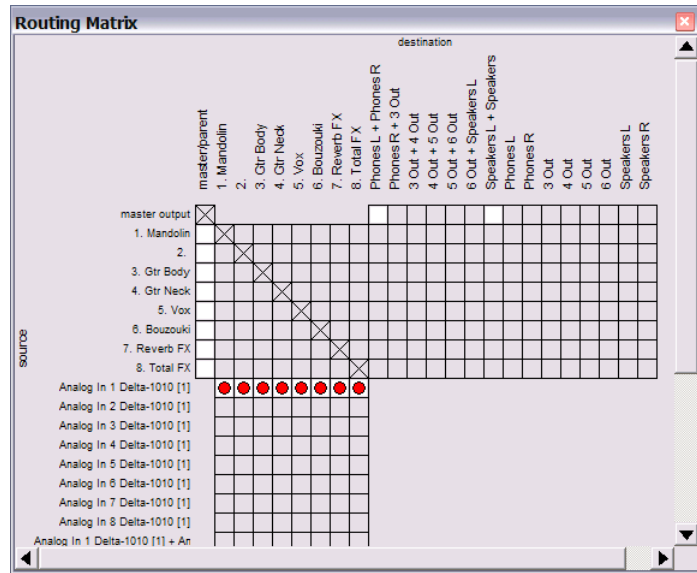
Of course, to prepare multiple tracks for recording, you could repeat steps 1. to 3. (above) as many times as you have tracks, but that might be tedious – and besides, it's too easy to make a mistake in selecting one or more of your audio inputs. You could end up with one input being recorded more than once, and perhaps another input being accidentally missed out.

This is something that, at one time or another, is likely to happen with most DAW software.

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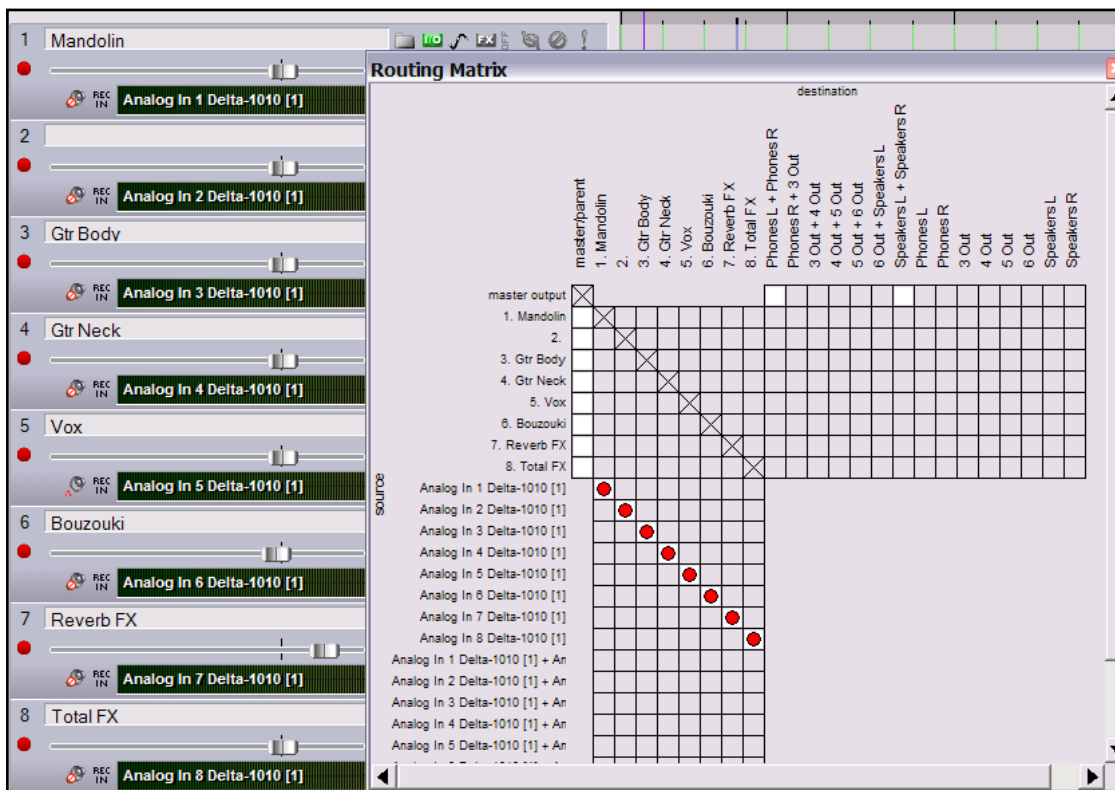
To avoid this problem, follow this sequence:

1. Select all tracks to be recorded. After making your selection, click on the **Record Arm** button of any one of them to arm the entire selection.
2. Display the **Routing Matrix** (right). In this example, we are assuming that we are recording six tracks at a time. Notice that by default, all six tracks are assigned to the first input. If you were to record now, the signal from the first input would simply be recorded six times!
3. Click in the appropriate cells in the Routing Matrix to assign each track to its required output.



In this example (see below), we are assuming that Input 1 is to go to Track 1, Input 2 to Track 2. Input 3 to Track 3, and so on.

4. Monitor the strength of the signals and record as before.

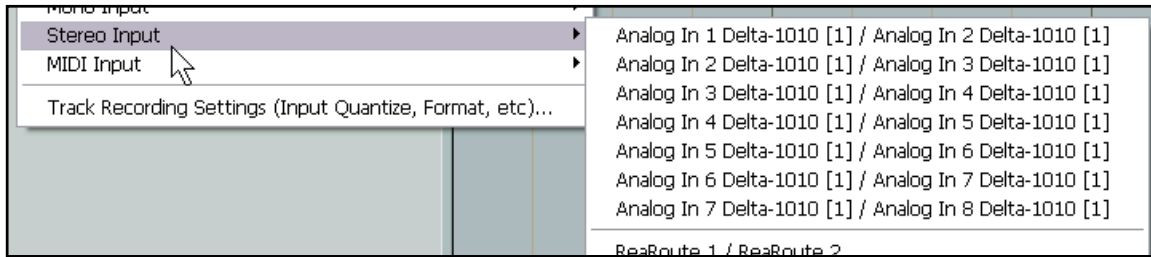


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3.6 Recording Stereo Tracks

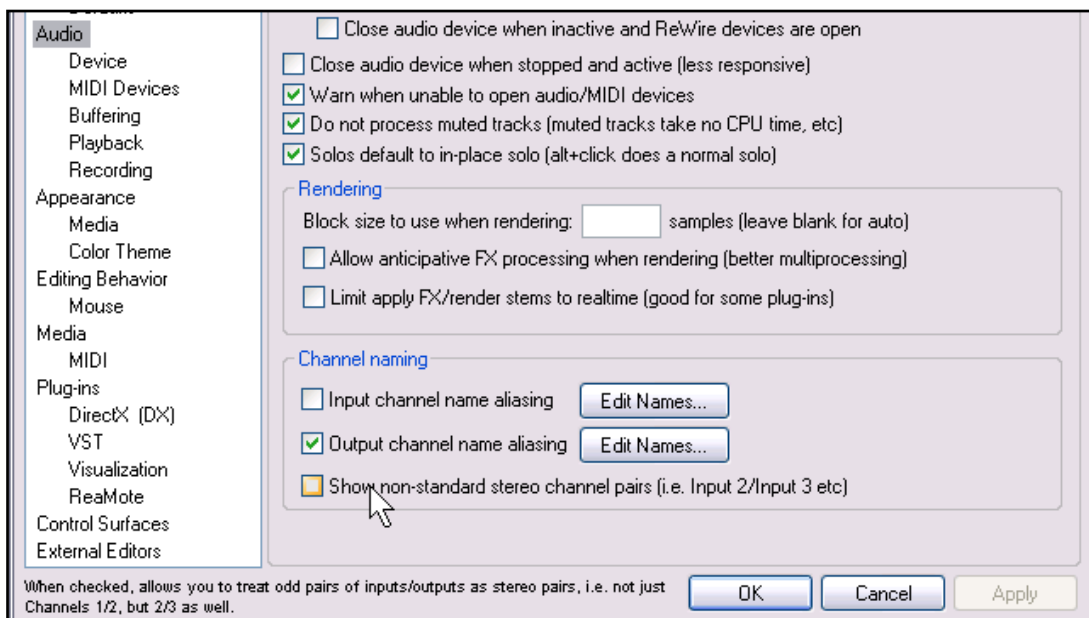
At times, you may wish to record from two inputs direct to a stereo track. This might be the case, for example, if you are uploading some old recorded material from audio cassette into REAPER.

By default, when you specify a stereo input for your recording, REAPER offers you a selection of options which includes a number of pairings that you might wish to disable.

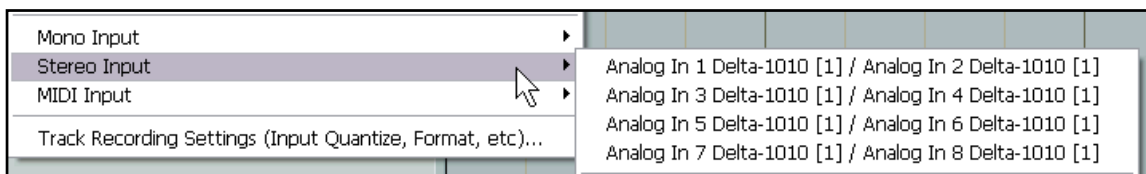


Consider the example shown above. It's quite likely that you might wish to record using a paired input such as In 1 and In 2, or In 3 and In 4, but unlikely that you will wish to choose, say, a combination of In 2 and In 3. If this is the case, you can make life easier for yourself by removing these unwanted options.

Simply choose the **Options, Preferences** command, then select the **Audio** settings page. Near the bottom of this page you can turn off the option to **Show non-standard stereo channel pairs** (see below).



With this option turned off, you will be offered a much simpler menu of choices when selecting inputs for recording with stereo inputs.



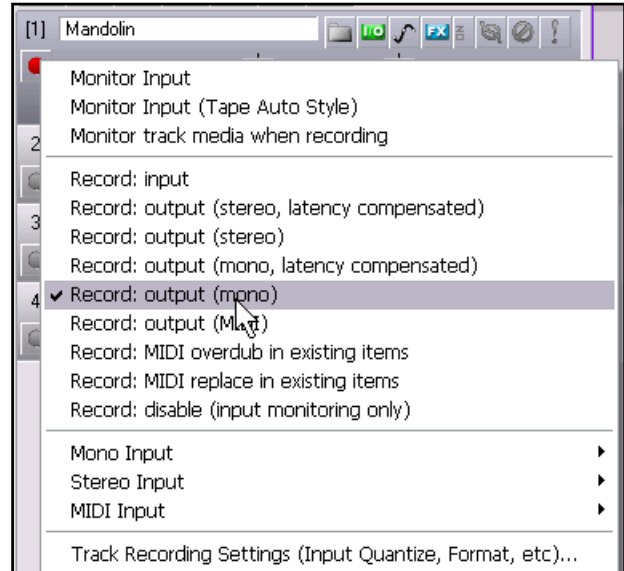
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3.7 Recording a Track's Output

When you record a track's input, you record the signal exactly as it comes into the computer, without any FX that are in the FX bin being recorded with the signal. This is the method of recording that is most commonly used. Of course, you will still be able to hear the FX being applied later when you play the track back.

However, with REAPER it is also possible to have FX applied to a signal and recorded with that signal, as the track is recorded. Of course, if you choose to do this, you cannot simply remove the FX from the track afterwards if you change your mind. To do this:

1. Select the track, and arm it for recording as before.
2. Select the required input as before.
3. Open the FX bin and insert the required FX.
4. In the Track Control Panel, right click on the **Record** button or the **Recording Mode** button, and select the required **Output Mode**. This is usually likely to be **Mono** (see right).
5. Still in the Track Control Panel, right click on the **Monitor Input** button and make sure that Monitor Input is turned on.
6. Monitor the signal strength and FX level.
7. When ready, record as before.



Note: As well as recording with software FX (as in the above example), REAPER also lets you record using an external FX device in the same way as you might use an insert device on an analog desk. We'll cover this towards the end of this section.

3.8 Recording the FX On Their Own

One real fun feature of REAPER is that when you have set up a track to act as an FX Bus (see [Section 2.12](#)), you can record just the FX on its own to a separate media file (usually WAV or MP3). This can, of course, be the output of a single FX or an entire FX chain.

Doing this opens up all sorts of creative options later when it comes to mixing.

To do this:

1. Select the FX Bus track and arm it for recording.
2. You might wish to also turn up the track's **Receives** to get a good strong signal – you can always turn down the volume when playing it back later.
3. Set the track to Monitor Input and chose the preferred **Recording Mode**. This is likely to be **Output, Stereo**.
4. Play the song and monitor the signal level.
5. Rewind to start and press Record.
6. Stop recording when finished.

Tip: If you do record a track's FX in this fashion, you will most likely want to set the FX to bypass mode after doing so. It is nevertheless a good idea to leave the FX inserted in the track's FX bin, as a record of how the FX was produced.

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3.9 Track Templates

After you have set up a track (or a number of tracks) for recording, you might think that you may wish to use this same track set up again in some future projects. This can be done using **Track Templates**.

To create a Track Template from an existing track (or selection of tracks):

1. Select the track or tracks.
2. Choose the **Track, Save Selected Tracks as Track Template** command.
3. When prompted, give your template a name, then click on **Save**.

To import an existing Track Template into a project:

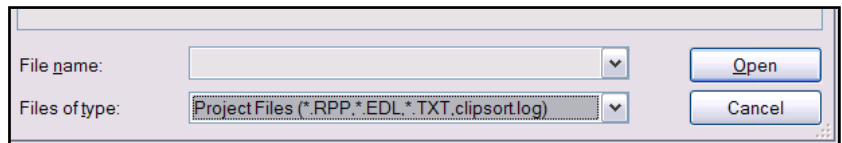
1. From the REAPER menu, choose the **Track, Insert Track from Template** command.
2. Depending on how your templates are stored, either select the required template from the menu, or choose **Open Track Template**, then choose the required template and click on **Open**.

Note: All of a track's properties and settings are saved into the template, including track name, inputs and outputs, any FX (with their parameters), sends and receives. However, if a track included in a track template includes any sends to or receives from any track or tracks that are not included in the template, then those sends or receives will not be saved into the track template.

3.10 Importing an Existing Project

You can use the **Track, Insert Track from Template, Open Template** command to import an entire existing REAPER project into your current project. Everything comes in exactly as it is in the original project file – media items, track settings, FX, routing, etc. Note however that items that are not track specific (such as markers) are not imported.

To do this, simply select **Project Files** as the File Type when the **Open Track Template** dialog box is displayed, navigate to select the file you wish to import, then click on **Open**.



The tracks from the imported project file are inserted immediately below the currently selected tracks.

3.11 Project Templates

A Project Template goes further than a Track Template in that it can be used based to create an entire Project File, based upon the structure and settings of the current file.

Thus, Project Settings (including Audio Settings) are saved with a project template, along with the screen layout, which views are open, how they are sized, whether they are docked, and so on.

However, unlike when creating a Track Template, you should remove the media clips and items from a file before saving it as a project template, otherwise every time the template is used to create a new file, those media items will be inserted. (Unless, of course, there are media clips that you actually *want* saved into the template).

To create a Project Template:

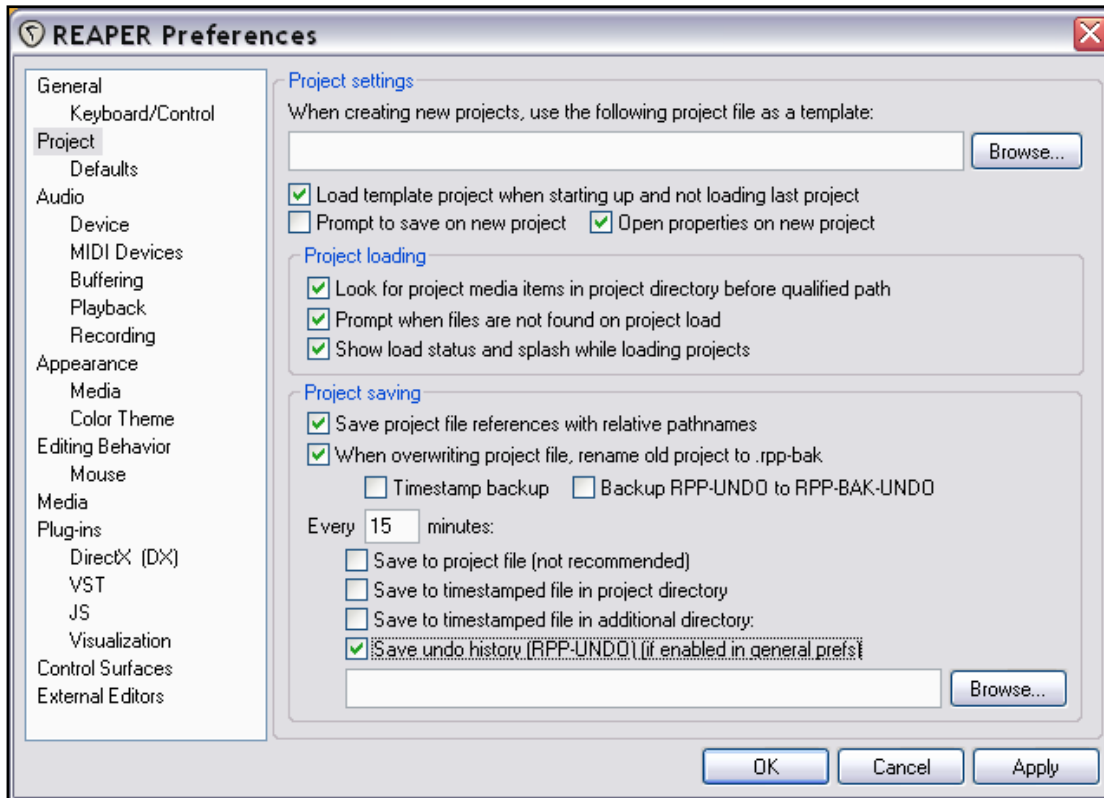
- With the source project file open, choose the **File, Project Templates, Save As Project Template** command. When prompted, give the template a name, then click on **Save**.

To create a new file based on a Project Template

- Choose the **File, Project Templates** command, then click on the name of the required project template.

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To use a Project Template as the basis of all new project files created:



1. Choose the **Options, Preferences** command.
2. Display the **Project** settings screen.
3. Click on the **Browse** button near the top right corner of the screen. Navigate to your Project Templates folder – this will be **C:\Documents and Settings\UserName\Application Data\REAPER\Project Templates** (where **UserName** is your user name)
4. Select the required Project Template file.
5. Click on **Open** to return to the **Preferences** window.
6. Click on **Apply** then on **OK** to close this window.

Tip: If you are specifying a default project template (such as in the above example) it is a good idea to also save an empty project as a project template called **Empty Project**. Then, whenever you want to create a new file that doesn't use your default project template, you can do so by simply choosing from the menu **File, Project Templates, Empty Project**.

Tip: When you are recording, make sure that the incoming signal is not too loud, or you can damage your recording equipment. Here's what to do:

1. Turn the input or gain control on your input device (e.g. firewire device or desk) all the way **down**.
2. If recording an instrument in-line, insert one end of the line into the instrument and the other end into your input device. Turn the output on the instrument fully **up**.
3. Audition the instrument, gradually raising the input or gain control on your input device until it is about right.

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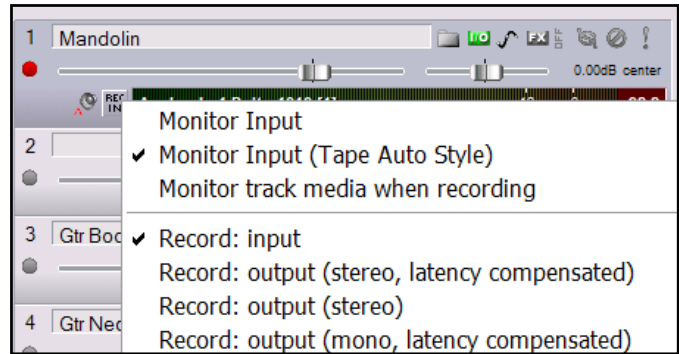
3.12 Layered Recording

The term *layering* refers to a recording technique in which two or more instruments and/or voices are recorded for the same song, but not all at once. Usually, the tracks are recorded one at a time.

An initial track is laid down – this is often a guide track which will be discarded at the end of the recording process. Then each other track is recorded while the musician or singer listens through headphones to a mix of what has already been recorded and what she is recording now.

In order to use this layered recording method:

1. With Record Mode set to Normal, record the initial track, [as detailed in Section 3.4](#).
2. After recording this track, make sure that the output of this track is directed to the Master. *Make sure also that you "disarm" this track.*
3. Make sure that the Master is directed to whichever audio hardware outputs are connected to your headphones or headphone amp.
4. Add another track. Name it. Arm this track for recording. Select the Input used by the microphone or line that is to be used to record this new track.
5. Make sure that Input Monitoring is turned in for this track, and that the Record Input option is selected (see right).
6. Adjust the Volume levels of the previously recorded track (using the track fader) and the volume level of the incoming signal (using your external mixer desk or audio device, or audio device control software) until you are happy with your headphone mix.
7. Press **Ctrl R** to start recording, and **Ctrl R** again to stop when finished. Again, disarm this track when you have finished recording on it.
8. Repeat this procedure for all other tracks to be layered. Of course, at step 6. you can feed into your Master a mix of all tracks previously recorded up to that point.



Tip: Many sound cards and USB or Firewire audio devices are supplied with software that can be used for input monitoring and headphone mixing. This is especially the case for those devices that have multiple inputs and outputs. If you use that software for input monitoring, then you should turn off the input monitoring option within REAPER.

Try it now! Open the supplied project file **All Through the Night.RPP** and save it as **All Through the Night LAYERS.RPP**. Have a go at recording another instrumental track of your choice to go into this project. Any instrument you choose!

3.13 Overdubbing and Punch Recording

At times, you might want to go back to an existing track to re-record a section of that track with which you are not satisfied, to correct perhaps just a few notes of an instrument, or a line or two of a vocal.

Punch recording makes it easier to do this.

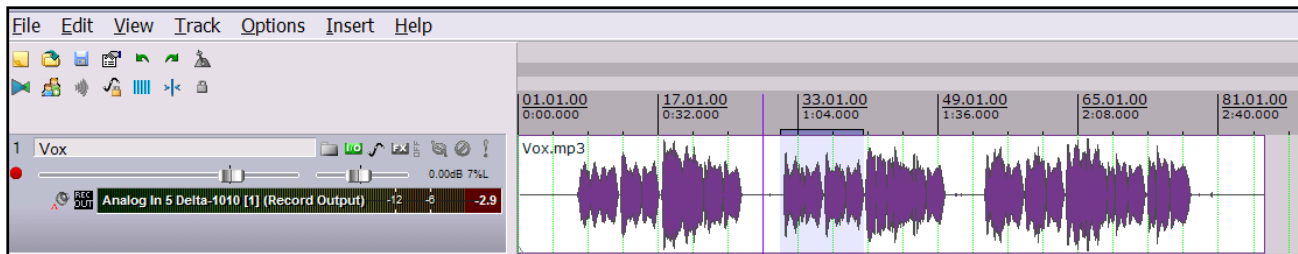
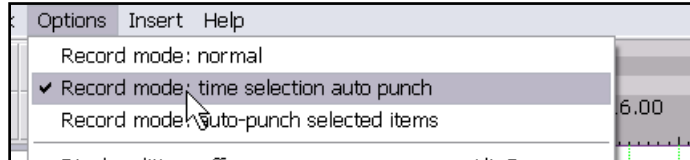
With punch recording, you can play back in your headphones the previously recorded track, along with any other instruments while you record. At the point where you want recording to begin, however, the track on which you are recording will cut out, and the recording will commence. At another point specified by you, the recording will stop, and the existing recording will come back in.

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3.14 Punch Recording

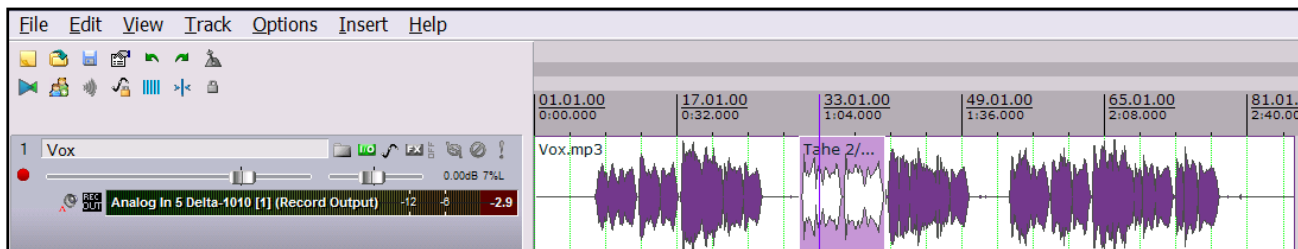
To use Punch Recording, follow this sequence:

1. From the menu, choose the **Options, Record mode: time selection with auto punch** command (see right).
2. Select the track and arm it for recording.
3. Make sure that the track output is sent to the Master and that Input Monitoring is enabled.
4. Make sure that the Master output is directed to the audio hardware outputs to which your headphones or headphone amp is connected.
5. Click once on the existing media item to select it.



6. Click and drag along the timeline above the first track to select the region that you want to be re-recorded (see above).
7. Rewind the track to a point a short way before the position where you wish to start recording. This can be done by simply clicking at the required place on the timeline.
8. Press **Ctrl R**. You will now hear the existing recording up to the start of the defined region, where you can re-record the required passage.
9. When prompted, accept the option to save your recorded media.

Notice that your track now contains two media items, with the new one superimposed on the old:



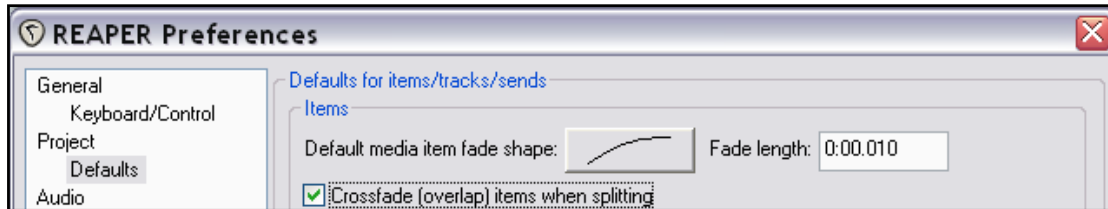
Tip: REAPER supports the standard Windows editing techniques. Editing will be covered in detail in [later sections](#), but for the time being, if you make a mistake or change your mind when overdubbing, you can use **Ctrl Z** to undo the recording or you can select the unwanted media item and use the **Delete** key to remove it.

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3.15 Fades and Crossfades

REAPER offers you the option to apply automatic crossfades and fades in and out of your recorded items.

This feature can be turned on and off or customised through the **Options, Preferences** menu, Project Defaults.

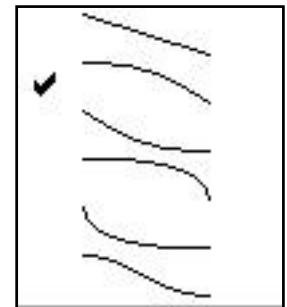


You can select a preferred shape and duration (length) for your fade curves. Clicking on the image of the curve (shown above) causes you to be offered a number of choices (see right).

If you prefer not to use automatic fades, set the default length to 0.0:000

As you will see later, you can easily change the default fade type and/or length for individual media items.

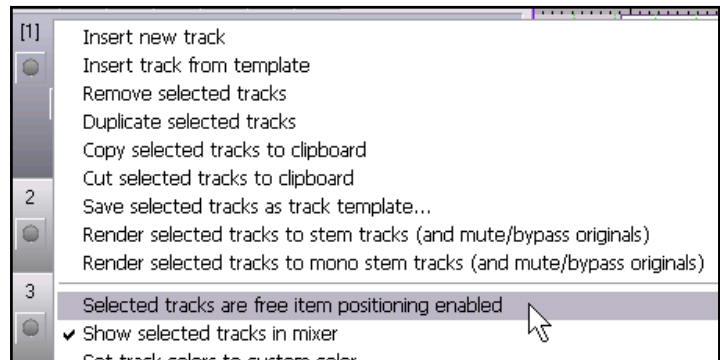
Tip: After you have finished your punch recording, you should be sure to reset recording mode to normal (**Options, Record Mode: Normal**) if you then want to record more new tracks in this project.



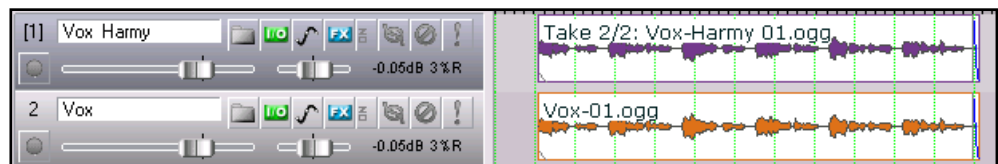
3.16 Recording Multiple Alternative Takes

REAPER's multiple takes feature can help you when you want to record several versions of a track to see which you prefer. It works like this:

1. Set record mode to normal (**Options, Record Mode: Normal**).
2. Make sure that **Free item positioning** is *not* enabled for the tracks being recorded. Right click over the Track Control Pane for the selected tracks and make sure this option is not ticked.
3. Record your first take of the track.
4. Rewind to the start then record your next take.
5. Repeat step 3. as many times as you wish.



In the example shown here, an initial vocal track has been recorded, then above it two takes have been made of a vocal harmony track. Notice the text displayed with the name of the media item displayed for the Harmony Vox track. It begins with the text **Take 2/2**.

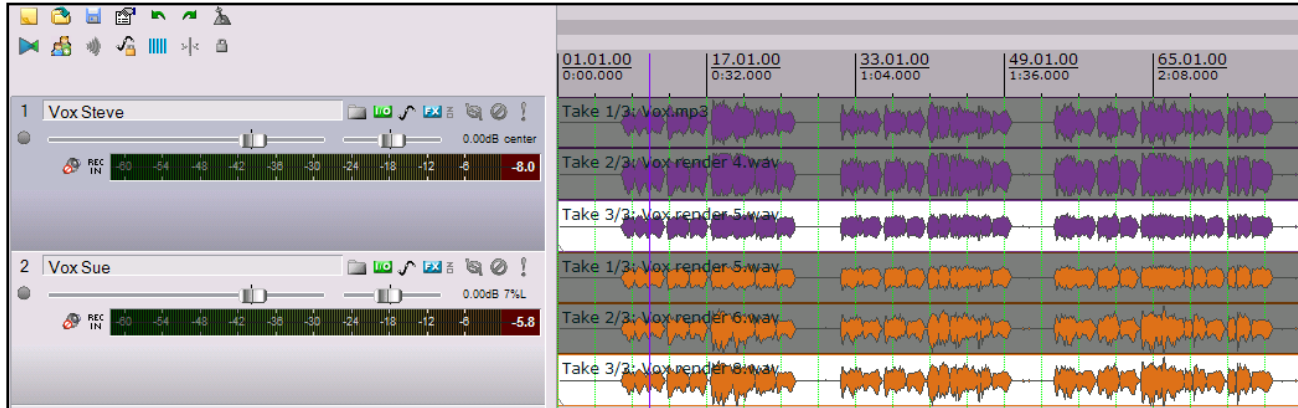


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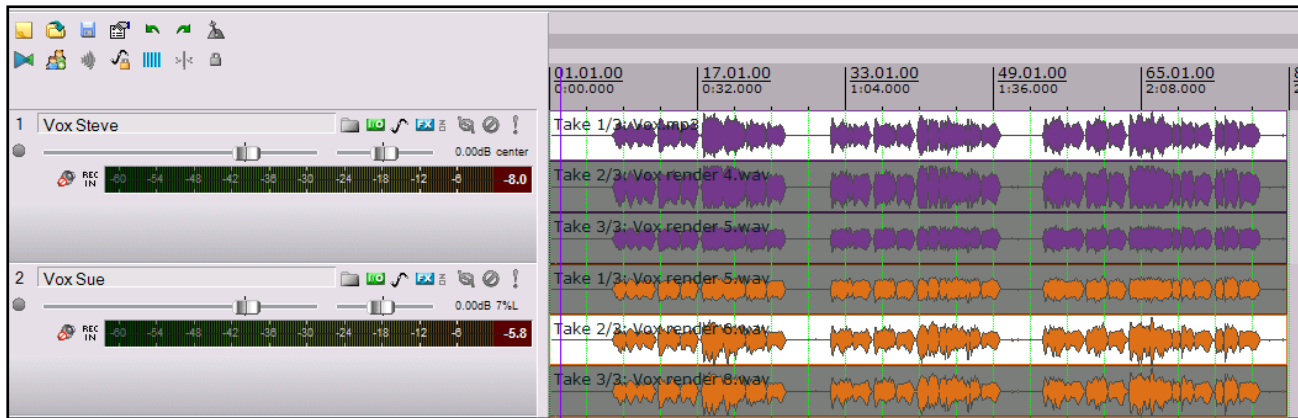
3.17 Showing Takes in Lanes

Optionally, when you have multiple takes, you may choose to have them displayed in lanes. This of course takes up more room on the screen, but has the advantage that it makes it easier to see for your various tracks which take is currently selected. This option is toggled on and off by pressing **Ctrl L** or by choosing **Options, Show All Takes in Lanes (when room)** from the Main Menu.

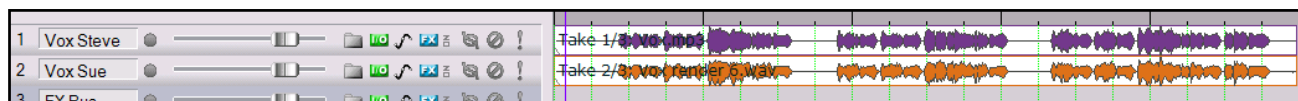
In the first example shown below, three takes have been made of a vocal duet. For both tracks, the third take is currently selected and will be played:



In this second example, Take 1 has been selected for the first track and Take 2 for the second track.



In this third illustration, the tracks have been minimised, so only one lane is visible. However, as long as the option to Show All Takes in Lanes remains active, the lanes will automatically be restored to view when the tracks are expanded.



Note: When you create multiple alternative takes in this way you will later be able to easily pick the best passages from each of your takes and join them together as a single item. The method for doing this will be explained later in this User Guide.

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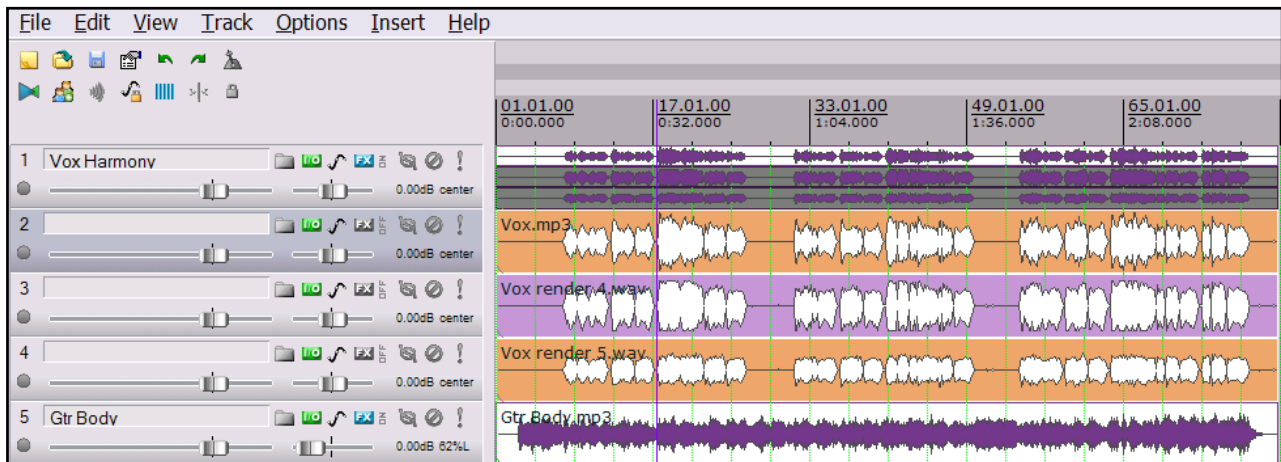
3.18 Working With Multiple Takes

To work in a project with multiple takes, select the displayed media item for the track (or group of tracks) for which you have multiple takes. This can be especially useful if you do not have room to display your takes in lanes.

You can right click over an item and use the **Take** command to select and manage your multiple takes:

Next Take	T
Previous Take	Shift+T
Delete Active Take	
Crop to Active Take	Alt+Shift+T
Explode All Takes to New Tracks	
Implode Selected Items to Takes	

Command	Shortcut	Effect
Next Take	T	Displays next take for selected track(s).
Previous Take	Shift T	Displays previous take for selected track(s).
Delete Active Take		Deletes currently displayed take for all selected track(s).
Crop to Active Take	Alt Shift T	Deletes all takes except currently active one for all selected track(s).
Explode All Takes to New Tracks		Creates a separate track for each take (see below).



Explode All Takes to New Tracks differs from **Show All Takes in Lanes** in that it lets you edit each take separately as a separate track. Later, in Section 7, you will be introduced to an example of [working with a project with multiple takes](#) which shows you how to do this. This will include how to select the best of each take for your final track.

Tip: Be careful about using the **Delete** key when working with multiple takes. You might end up accidentally deleting all takes for all selected tracks. If you do this by mistake, you can press **Ctrl Z** to immediately undo this.

Try it now! Open the project file **All Through The Night LAYERS.RPP** (which you saved earlier) and add a vocal harmony track to this project. Use this track to record three takes – then save the file.

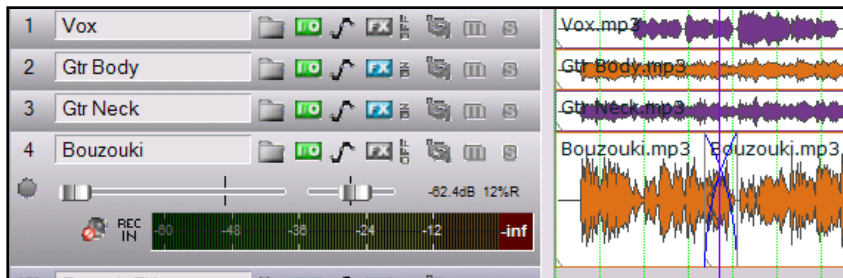
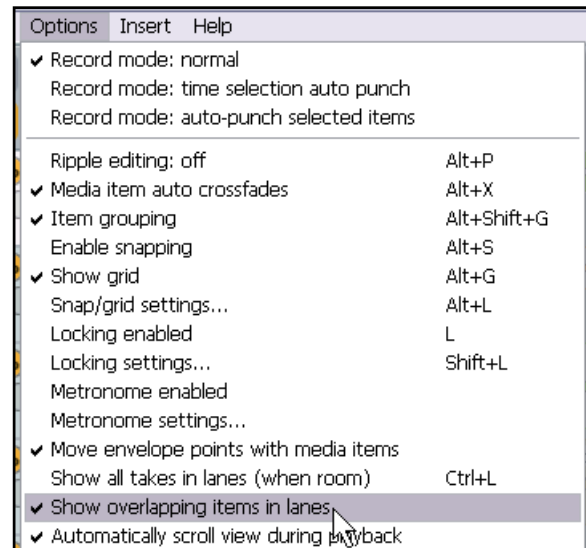
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3.19 Overlapping Takes

Sometimes when you are creating multiple takes, you will want to start recording your new take just before the end of a previous take, so that the two items will overlap.

In cases such as these, you have the option to **Show overlapping items in lanes**. This command is on the **Options** menu and can be toggled on and off.

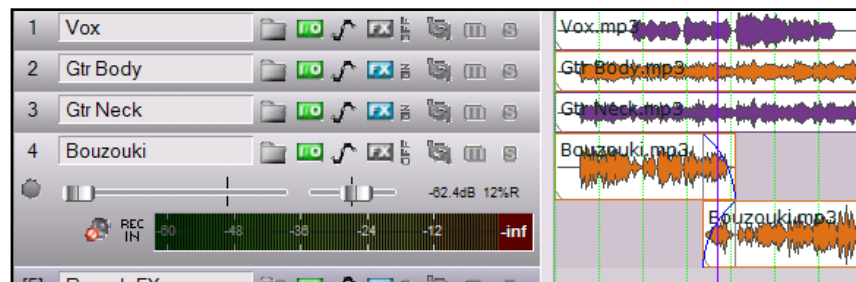
The example shown below illustrates this.



In the first picture (left) the **Bouzouki** track consists of two overlapping items.

If not for the cross-fades, you could easily not notice that there were two separate takes there.

The second picture (right) shows the same track with the same two takes, but with the option to **Show overlapping items in lanes** selected.



Note: When you have the **Show overlapping items in lanes** option selected, you might also wish to right click over one of the items and also select **Item Settings, Play All Takes** from the context menu.

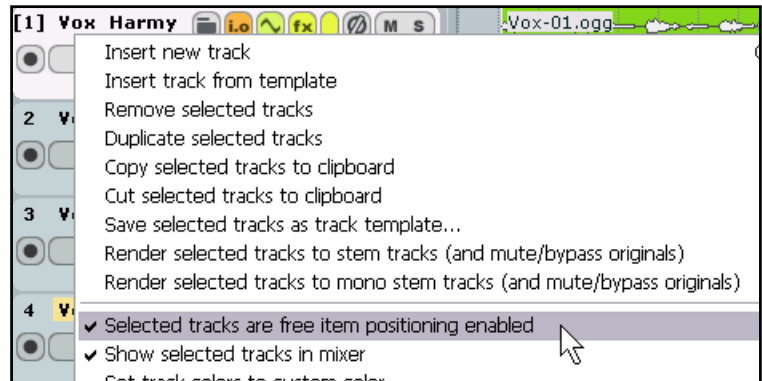
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3.20 Recording Multiple Additional Items

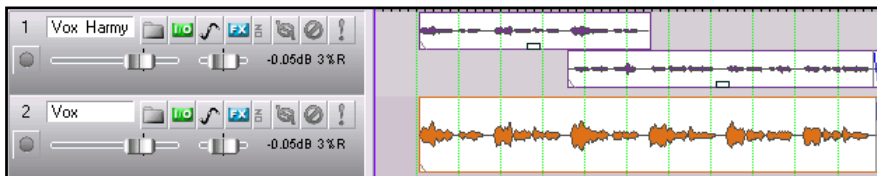
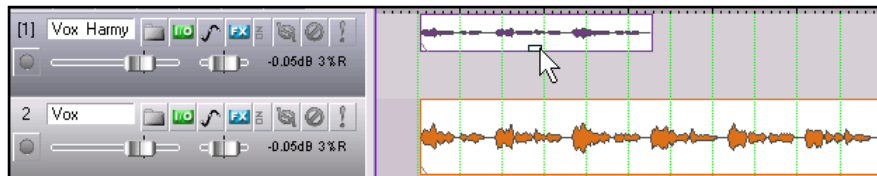
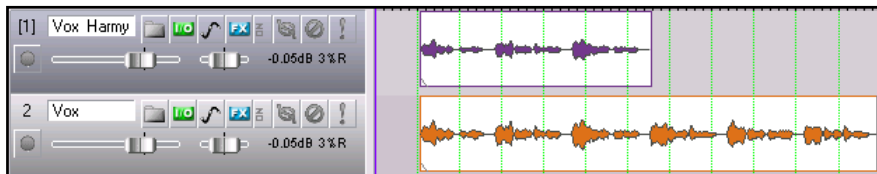
We have already seen how you can use Reaper to record multiple alternative takes on the same tracks. Later, you will be shown how to edit these, so as to take the best parts from each of several takes and then patch them together into a single track.

As an alternative to recording multiple alternative takes, however, you may wish to record additional items onto an existing track, perhaps overlapping. This is an example of where the option to enable free item positioning can offer you greater flexibility. To record additional items on to an existing track (rather than additional takes), follow this sequence:

1. Set record mode to normal (**Options, Record Mode: Normal**).
2. Make sure that **Free Item Positioning** is enabled for the tracks being recorded. Right click over the Track Control Pane for the selected tracks and select this item if it is not already ticked.
3. Record your first item for the track.
4. Position the cursor at the point where you wish to record the second item.
5. Record this item.
6. Repeat steps 4. and 5. as often as required.



Example



In the screen shot shown here, Track 2 contains a Vocal Track and Track 1 a Vocal Harmony for the first half of the song.

In the second screen shot, the option for **Free item positioning** has been enabled for Track 1. The mouse pointer shows a small handle that can be used to adjust the height of this media item.

In the third screen shot, a second Vocal Harmony has been recorded on to Track 1, overlapping the original harmony.

Notice that this is not an alternative take of the first harmony, but an *additional* media item

Note: In the Options, Preferences, Project, Defaults window there is an option to make free item positioning enabled for your tracks by default.

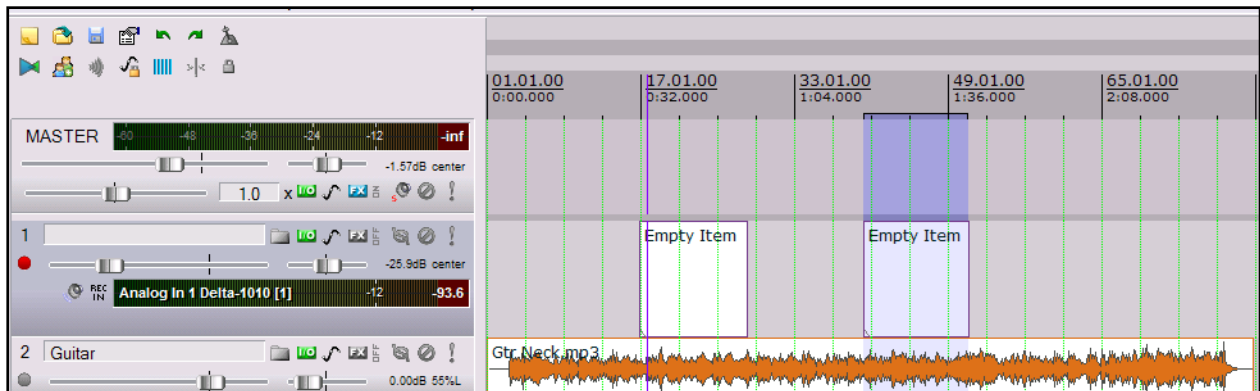
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3.21 Recording with Empty Events

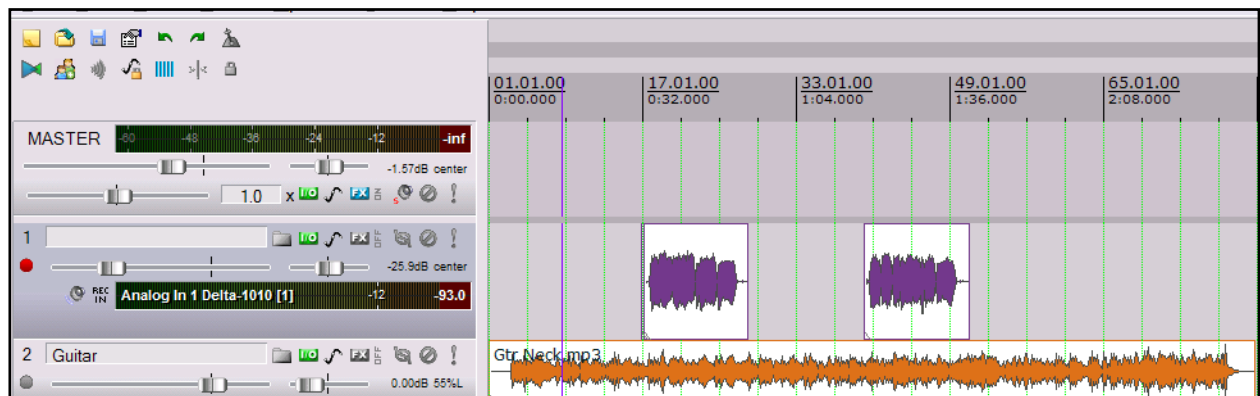
Empty Events are a clever device which can be helpful when you are overdubbing or layering. If you know exactly the regions where you want recording to start and stop, you can define these regions by inserting empty events. Then, when recording is commenced, only those regions defined by the empty events will actually be recorded.

Let's take an example where a vocal track has already been recorded, and we now want to lay down a harmony vocal, where this harmony is only used for the chorus line of the song. This is how you would do this:

1. Insert a new track to be used for the vocal harmony. Ideally, you should name this track straight away.
2. Arm the track for recording. Turn on **Monitor Input** for this track, and make sure the output from the Master is directed to your headphones.
3. Use the **Options** menu to ensure that **Record mode: auto punch selected items** is chosen.
4. Use the **Insert, Empty Item** command to create as many empty events as you need for your recording. If necessary, click and drag to move these so the start of each empty event is correctly positioned.
5. If you need to resize any of them, hover the mouse over the border between the end of the event and the background, about half way up. Click hold and drag to the left to make it shorter, or to the right to make it longer. Then release the mouse.
6. Select all of the required events. To do this, use the **Ctrl** key while clicking on each in turn. An example of what you should now have is shown below. If you need to reposition the Edit Cursor before recording, do so by clicking on the Timeline.



7. Press **Ctrl R** to start recording. When finished, press **Ctrl R** again to stop. If prompted, accept the option to save all files.
8. Your screen should now show something similar to this:

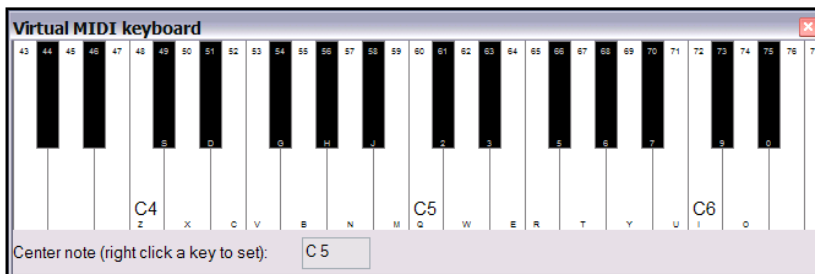


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3.22 Recording MIDI

You have a number of options for recording MIDI, depending on what equipment you have and how it is set up. In every case, however, the principle is the same:

- You will need a MIDI input device, such as a keyboard attached via a MIDI In port on your sound card or other audio device.
- You will need to create a track (or assign an existing one) for your MIDI recording.
- You will need to assign an output device for your track.
- You will need to assign a Channel for the MIDI item.
- You will need to turn Input Monitoring on to be able to hear what you are playing.



REAPER includes a **Virtual MIDI Keyboard**, which can be played using your mouse or PC keyboard.

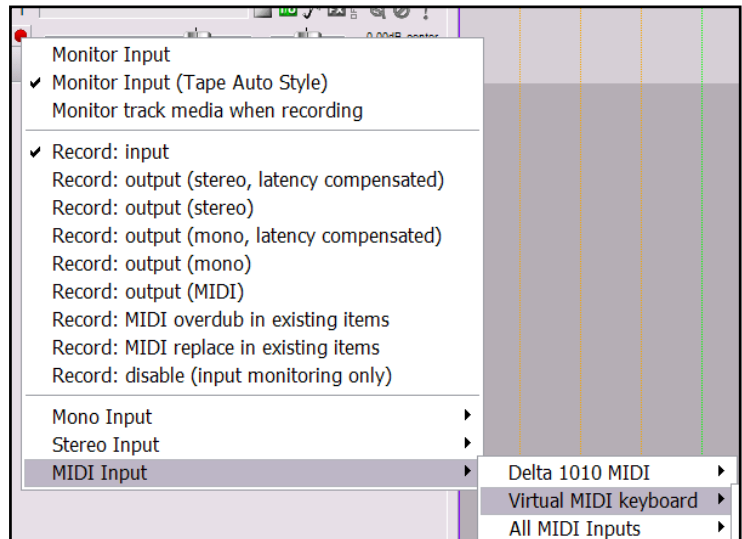
This keyboard is displayed using the command **View, Virtual MIDI Keyboard**. The shortcut keys **Alt B** can be used to toggle display on and off.

Procedure for Recording a MIDI Track

1. Insert a new track into a project file. Arm this track for recording.

2. Make sure that your MIDI keyboard is connected to the MIDI Input of your sound card or Audio Device and that it is switched on. In this example, we will be using the **REAPER Virtual MIDI Keyboard**. If this is not visible, press **Alt B**. Right click over any key that you wish to make your centre note.

3. On the track you are using, right click over the **Rec In** button and make sure that Monitor Input and Record Input are both selected, and that you have selected the Virtual MIDI Keyboard as the MIDI Input device, and that you have selected a MIDI Channel (in this example, select **All Channels**).



4. Make sure that the Track's output is directed to the Master, and that the Master output is directed to the hardware audio outputs to which is attached the speakers or headphones that you wish to use when recording.
5. In this example we will use a Software Synth. Open the FX Bin for this track. You will need to insert a Software Synthesizer here. You can use any such synth that you already have installed. In this example, we will be using **VSTi Reasynth (Cockos)**, which is included with REAPER. For the time being, leave the Reasynth parameters at their default settings. (Later in this guide you will learn more about ReaSynth.)

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6. Press **Ctrl R** to start recording. Play a simple tune on the Virtual Keyboard. Use your mouse or PC Keyboard – for example, **zxcvbcxz** will play half a scale up and down. When finished. Press **Ctrl R** again to stop recording. If prompted, save your media item.

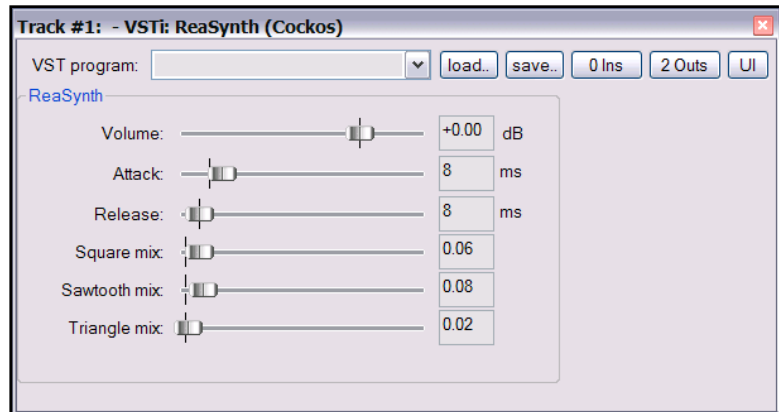
In Section 12, we will see how the midi data that has been recorded can be edited [using REAPER's built in midi editor](#).

Procedure for Playing Back a MIDI Item

Play the track, as you would any other. As it plays back, you can alter the nature and shape of the sound by adjusting the soft synth parameters.

When you have found a sound that you like, you can click on the **Save** button to save that set of parameters as a preset that can be recalled for other projects.

You can make and use presets in this way for all FX Plug-ins and Synths.



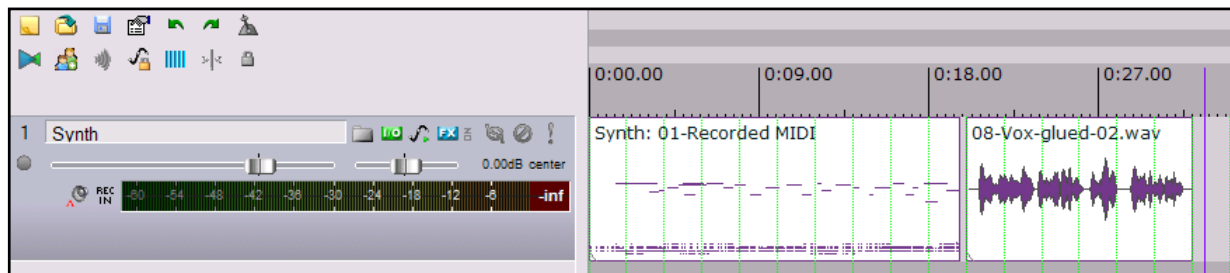
Note: This last example demonstrates one important difference between MIDI and Audio.

With **Audio** the actual sounds made by the instrument or voice are recorded. It is possible to use real time FX like EQ, Compression and Reverb to alter how the audio item sounds when it is played back, but the audio item itself stays the same.

With **MIDI**, you are essentially recording a series of instructions that by themselves have no sound. The music is created when those instructions are fed to a synthesizer. Thus, by changing the parameters of the synthesizers settings – or even by changing the synthesizer – we are able to produce a completely different sound.

Note Unlike some other DAW programs, REAPER makes no artificial distinction between a MIDI track and an Audio track. MIDI items and Audio items can be combined in the same track (see example below).

MIDI Recording Modes



When recording MIDI, you should select one of four recording modes. In the above example, we used **Record Input**. This mode will record new items as a new take over any existing items. However, in addition there are:

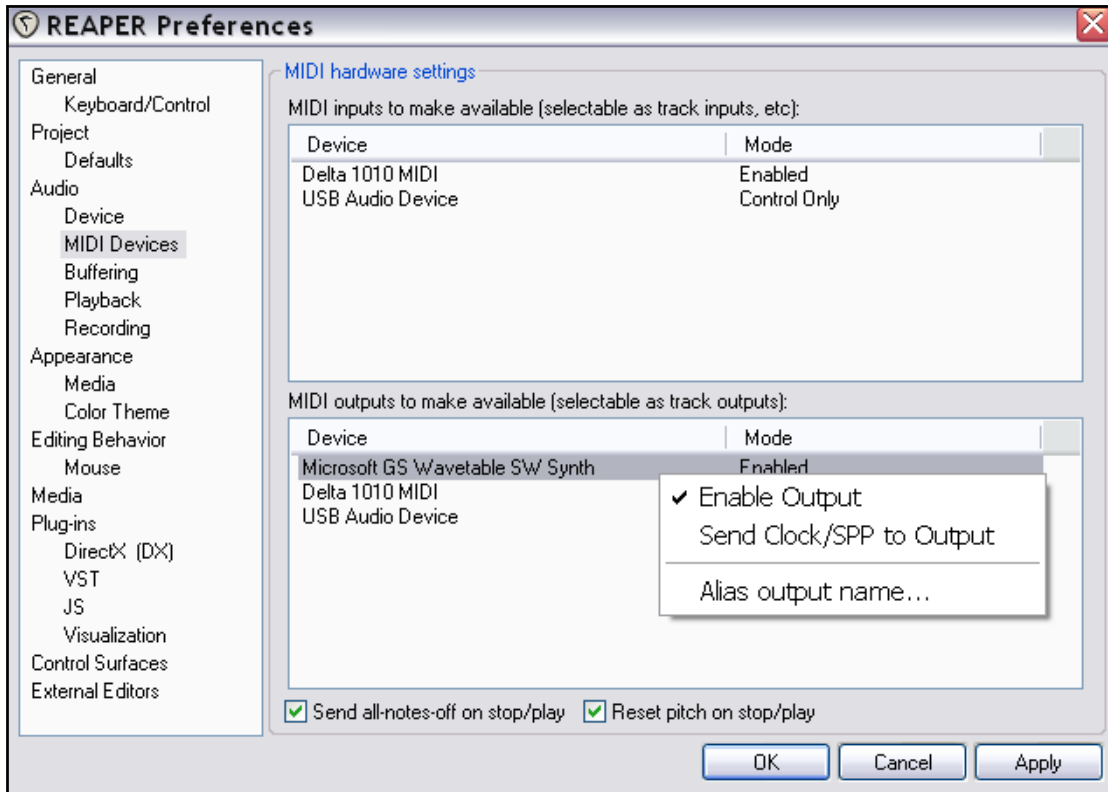
- **Record Output (MIDI)** Similar to the input mode, but records the MIDI coming out of the FX chain.
- **Record MIDI overdub in selected items** : this will add notes **within** items.
- **Record MIDI replace in selected items**: this will replace notes **within** items instead of overwriting the items themselves.

Try it now! If you have a MIDI keyboard, open the project file **All Through The Night LAYERS.RPP** (which you saved earlier) and add a MIDI keyboard track to this project.

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3.23 Using Microsoft GS Wavetable SW Synth

If you do not have any other synthesizer at your disposal, you can still use the Microsoft GS Wavetable Synth that is included with Windows. This can be especially useful for playing any existing MIDI files that you may wish to import into REAPER. You will be shown how to import files later in this section.

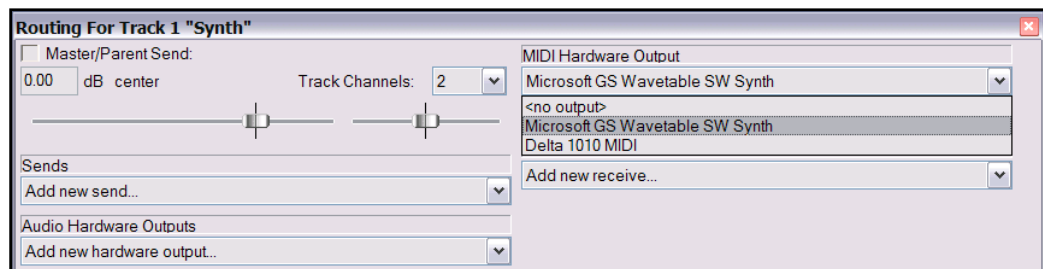


To enable the Microsoft GS Wavetable SW Synth:

1. Go to **Options, Preferences** and display the **MIDI Devices** screen.
2. Under MIDI Outputs, double click on Microsoft GS Wavetable SW Synth and select **Enable Output**.
3. Click on **Apply**, then on **OK**.

This Synth will now be available as a MIDI Hardware Output on your various input/output and routing screens.

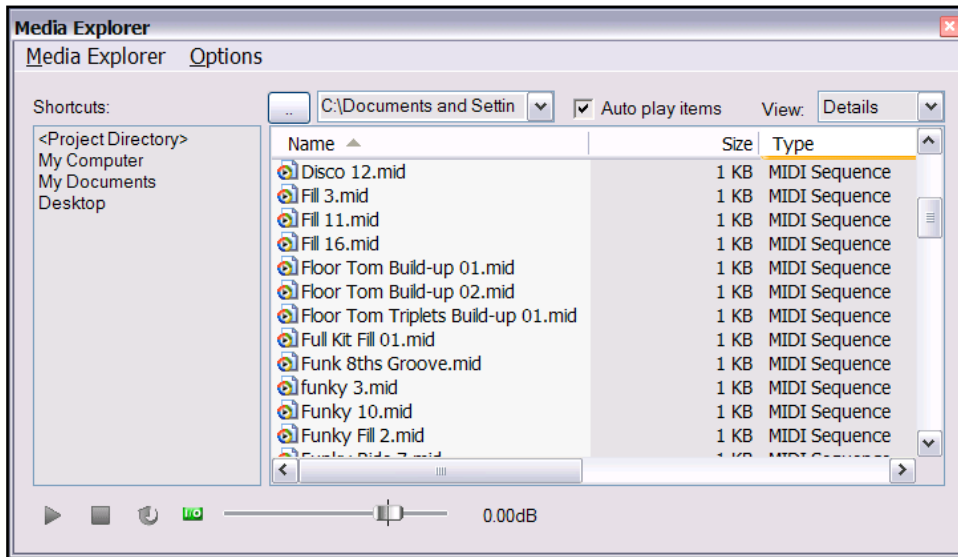
When you are recording MIDI, you can if you wish now use the **Microsoft GS Wavetable SW Synth** as your output device instead of using a software synth (see above).



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3.24 Importing Media

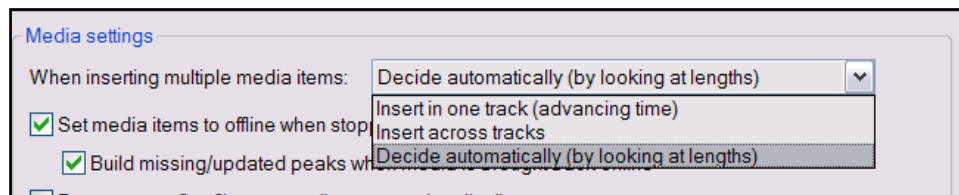
You can incorporate existing media items (such as MP3, MIDI and WAV files) into a REAPER project. This can be done from the main menu, using the **Insert, Media File ...**, but it's probably easier and more useful – and certainly more fun – to use REAPER's **Media Explorer**.



The Media Explorer's state is toggled between displayed and hidden using the **View, Show Media Explorer** command, or the keyboard shortcut **Ctrl Alt X**.

Amongst the Media Explorer's useful features are these:

- The Media Explorer can be docked and undocked in the usual way.
- You can navigate to display the contents of any folder in its main window, by clicking on the small button shown in the above illustration just above the column headed *Name*.
- You can add the currently displayed folder to the Media Explorer's shortcut list by using the **Media Explorer, Add current folder to shortcuts list** command. This makes it very easy to access frequently used folders without the need for complex navigation.
- You can preview any file displayed within the Media Explorer by clicking on its name. If the Auto play option is enabled, it will play automatically when selected. Notice also the small Transport bar beneath the Shortcuts Panel – this lets you Play, Stop and adjust the Volume for the currently selected media item.
- By clicking on the I/O button, you can direct the Preview output to any audio output.
- Right clicking over the name of any media item will produce a context menu, whose choices include **Insert into project** and **Insert into project as new track**. Alternatively, you can just drag and drop, or double-click.
- Multiple selections can be inserted by making the selection and then right-clicking. The **Media** screen in the **Preferences** window includes a setting to control the default behaviour of multiple insertions.
- When it has focus, you can close the Media Explorer just by pressing the **Esc** key.



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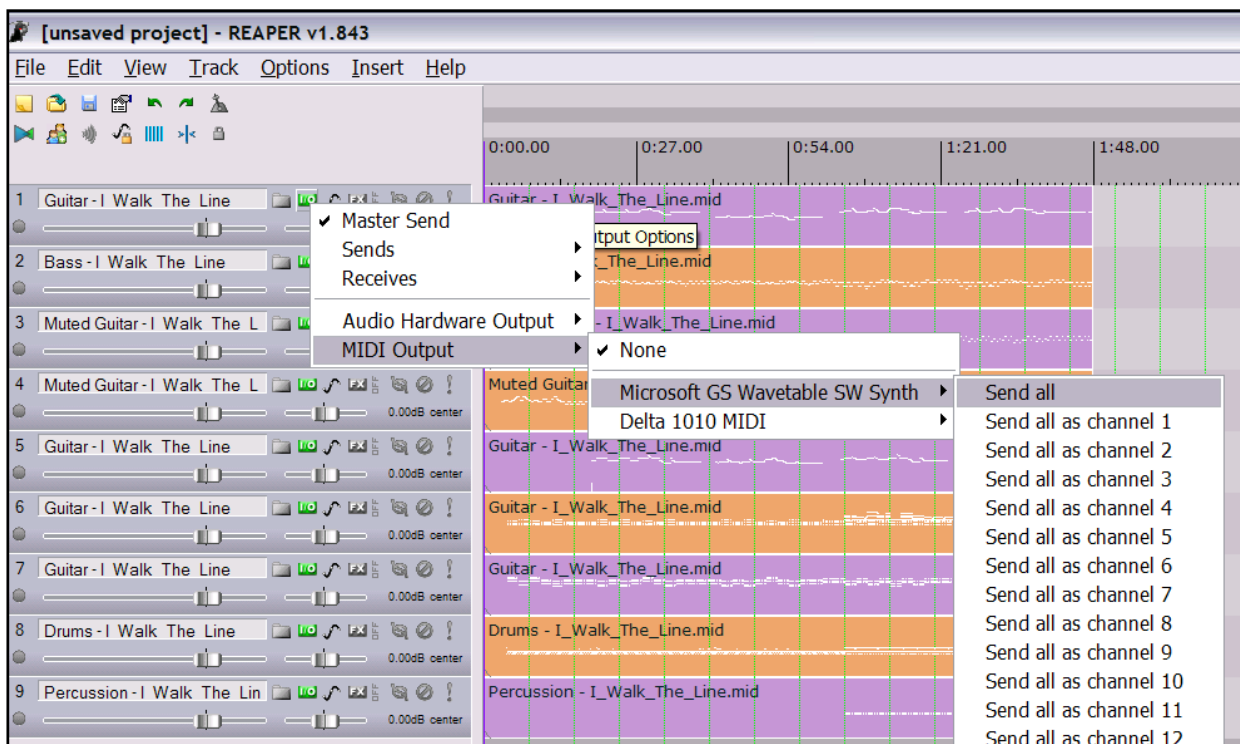
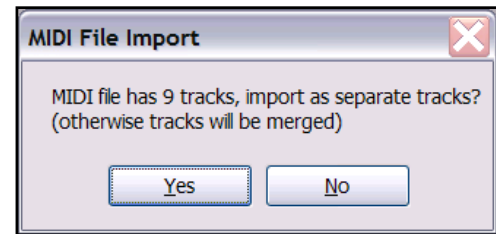
3.25 Importing MIDI Files

When you import a type 1 MIDI file into REAPER, you are offered the option of separating the tracks, or importing the file as one track.

Right click over the name of the MIDI file in Media Explorer and choose **Insert Into Project (As A New Track)** from the menu. A message such as that shown on the right will appear.

If you choose **Yes**, the file will be imported as a series of separate tracks.

To then assign these tracks to your required output (to enable you to play the song), follow this sequence:



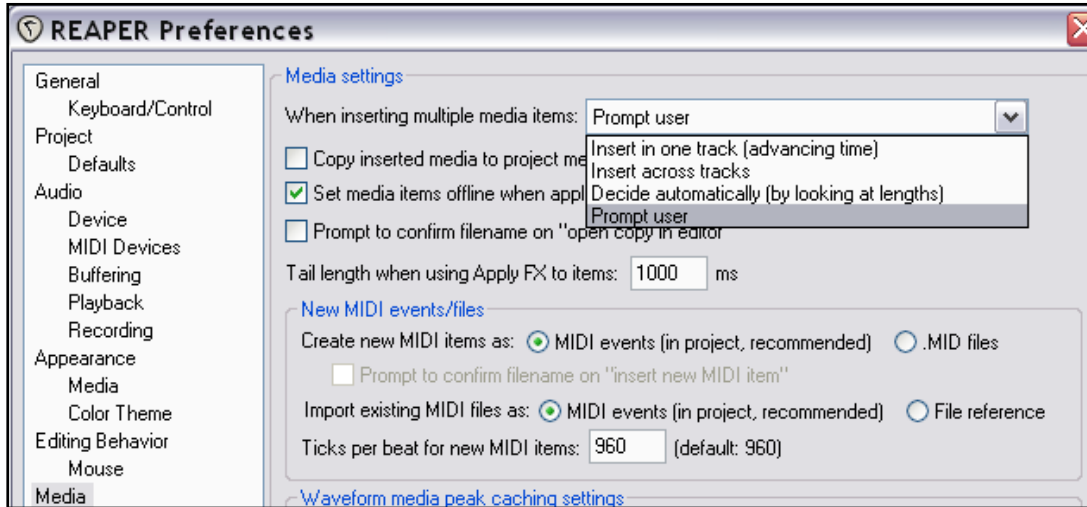
1. Select all of the imported tracks.
2. Right click over the I/O button for any one of these tracks.
3. Select **MIDI Output, Microsoft GS Wavetable SW Synth**, then select **Send All** or one of the **Send All as channel** options.
4. Save the file when you finished.
5. Play the file.

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3.26 Importing Wave Files

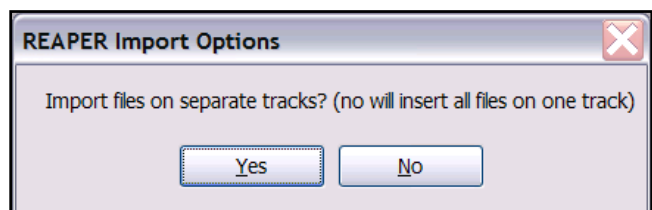
Wave files can be imported into a project in the same way as MIDI files, via the Media Explorer. For example, if you have a set of wave files that have perhaps been exported from another DAW application such as Cubase or Sonar, you can import them all together and automatically create a new track for each.

Alternatively, you can just drag and drop the files from REAPER's Media Explorer window, or even from Windows Explorer. If you intend to do this, you should be sure to select your preferred option under **Options, Preferences, Media** (*not Appearance, Media*).



Your four options are:

- **Insert in one track (advancing item)** – each is placed one after the other in the same track.
- **Insert across tracks** – each item is placed in a separate track, all starting together.
- **Decide automatically** – if files are of the same length (file size) they will be placed in separate tracks, otherwise they will be inserted sequentially in the same track.
- **Prompt user** – you will be prompted to indicate your preference (see right).



Alternatively, you can use the same method as was outlined earlier.

Simply select all the files in REAPER's Media Explorer window, then right click and from the menu choose the **Insert Into Project (as new track)** command.

The files will be inserted at the current play cursor position.

Note that the **Media** page of the Preferences window also includes a number of other options that are relevant when you are importing items:

- **Copy inserted media to project media directory** – causes a copy of the inserted media items to be made in the project's media items folder.
- **Prompt to confirm filename on "open copy in editor"** – when opening a copy of any media item in your editor of choice, you will be prompted to name and save the copy before the wave editor is opened.

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3.27 Using the Metronome

You can set up and use a Metronome when using REAPER for recording.

To do this, you need first to use the **Options, Metronome Settings** command to set up your metronome.

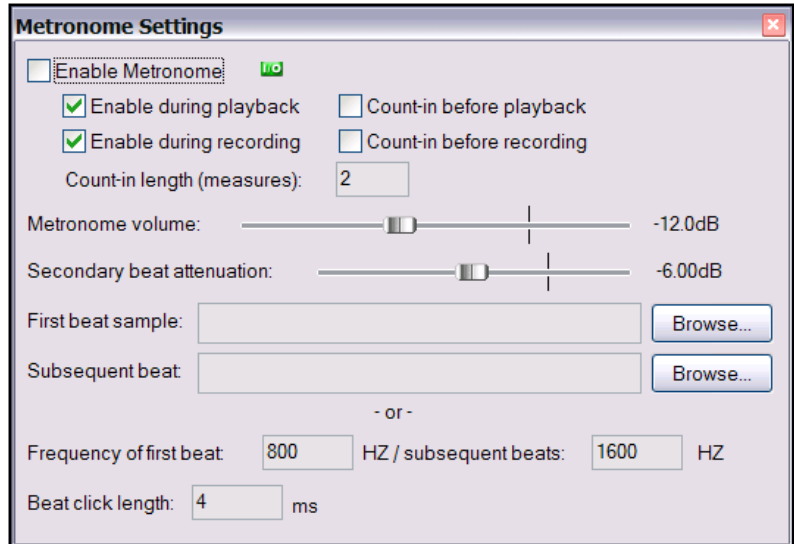
The **Options, Metronome Enabled** command is then used to toggle the metronome status on and off.

The Metronome Settings

Enable Metronome: This turns the built-in metronome on or off.

The I/O Button: Immediately to the right of the *Enable Metronome* option, this allows metronome output to be directed to the device of your choice (eg, Headphones).

Metronome Routing: This can route the metronome to a hardware output. Click on the little green button to the right of *Enable Metronome* and select from list of available hardware outputs.



Enable During Playback: This will turn the metronome on during playback.

Count-in before playback : This will enable a count-in before playback.

Enable During Recording: This will turn the metronome on during recording.

Count-In During Recording: This will enable a count-in before recording. Useful if you are recording yourself. It ensures that when you press **Ctrl R** the recording will not actually start until after the specified count-in. This gives you time to get back to the microphone and pick up your instrument.

Count-In Length (Measures): This defines the number of measures a count in should be. If it is the very beginning of a project, it will wait those number of measures before starting to record. If you select a place to record within a project, it will start the count in this many measures before the time that you want to record at.

Volume: Metronome Volume - This is the overall volume of the metronome.

Secondary Beat Attenuation:- This, in relation to the overall volume, the amount of the that secondary beats will be attenuated (or lowered in volume).

Sample Selection

You can also use Samples for your own metronome sounds.

First Beat Sample: This is the sample for the first beat. (in 4/4, the 1)

Subsequent Beat: This is the sample for other beats. (in 4/4, the 2,3,and 4)

Synthesised: By default, REAPER uses a synthesised metronome. The below settings show what frequency in hertz the metronome uses.

Frequency of First Beat "xx" HZ

Subsequent Beats "xx" HZ

Beat Click Length xx ms: This is how long each beat click lasts.

Tip: The Metronome Time Base is controlled by the **Project Settings**. Press **Alt Enter** and display the **Project Settings** page if you need to change this.

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3.28 Recording with External FX

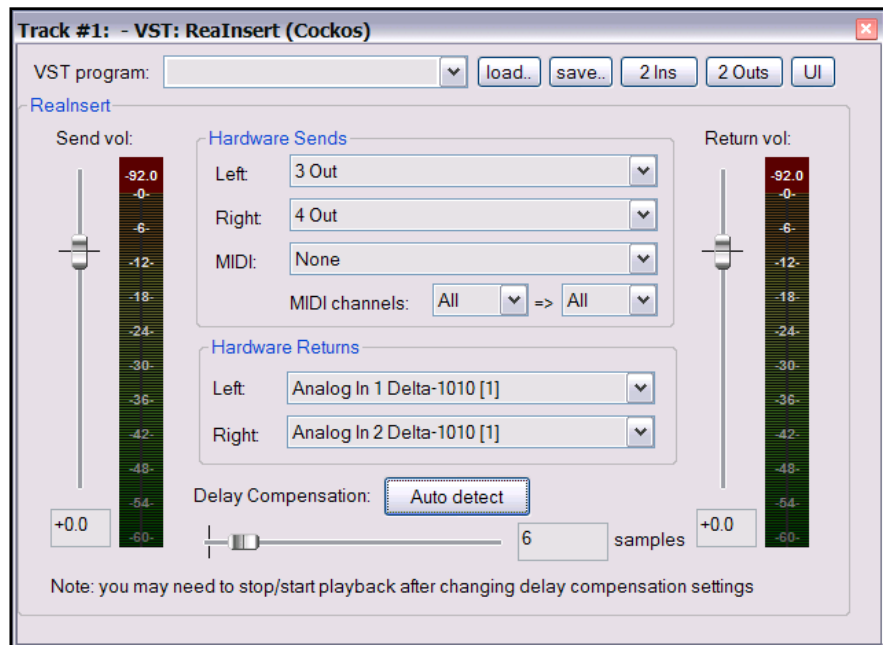
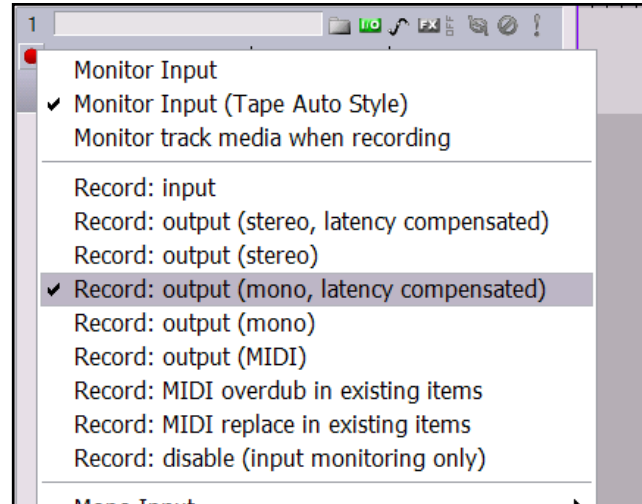
One special feature of REAPER is the way it can be used to record a track using an external hardware FX device in much the same way as you might use an external device as an insert when recording on an analog desk. It does so by making use of a special plug-in called

ReaInsert.

Here's how it's done. If you want to try it out step by step, create a new REAPER project file, insert a track, then get your FX device ready.

Example

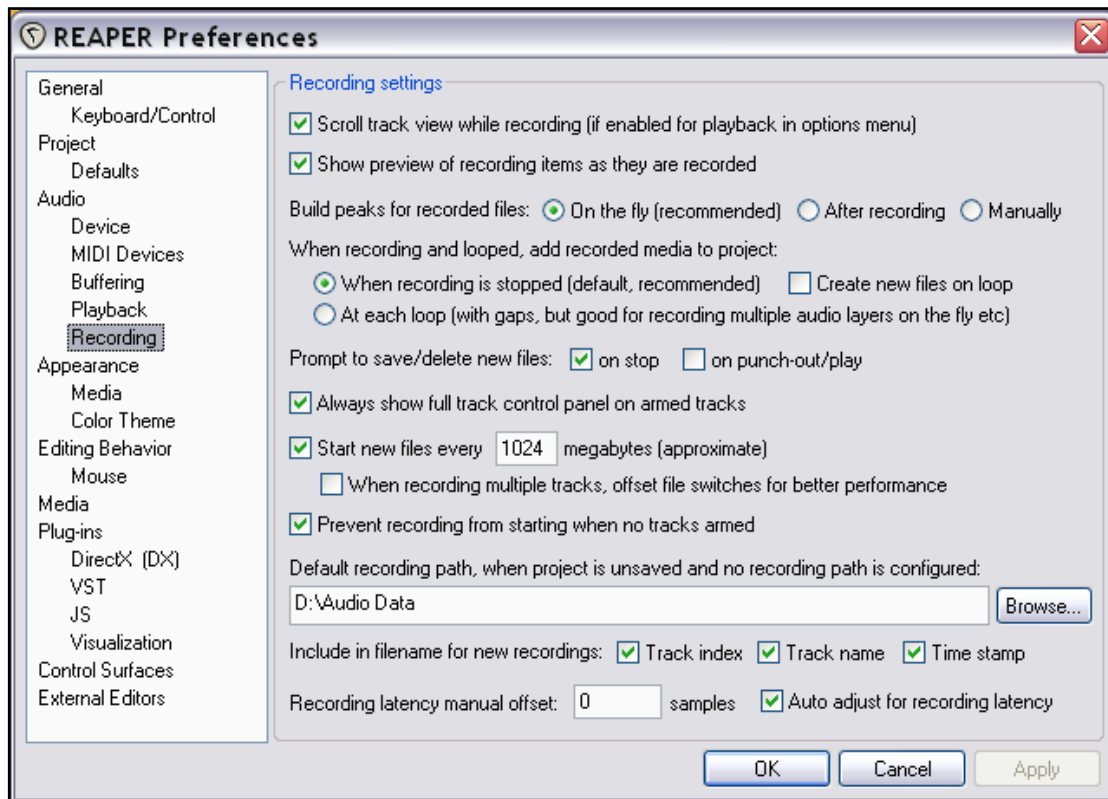
1. Connect an otherwise unused audio output to the input for your FX device.
2. Connect the output of your FX device to an otherwise unused audio input.
3. Create a new REAPER project files and add a single audio track. Give this track a suitable name. Let's record a vocal with the FX on it.
4. Connect your microphone to an otherwise unused audio input. Switch on the FX Device.
5. Arm the track for recording. Select the input device (to which the microphone is attached), select **Monitor Input** and specify that you want to **Record Output**.
6. Now display the FX Window for this track, and add the **FX VST:ReaInsert** to this window.
7. Specify the actual Hardware Sends and Returns that you set up at steps 2. and 4.
8. Make sure the FX Device mix is set to 100% Dry, then click on **Auto Detect**. This enables REAPER to calculate the required degree of delay compensation.
9. With the track's output directed to your headphones, monitor the required Volume and FX Levels, including the FX Wet/Dry mix.
10. When you are ready, Record.
11. When finished, don't forget to disarm the track and set the ReaInsert plug-in status to **Bypass**.



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3.29 Preference Settings for Recording

The **Recording** page of the **Preferences** window can be used to specify a number of options about REAPER's recording behaviour.

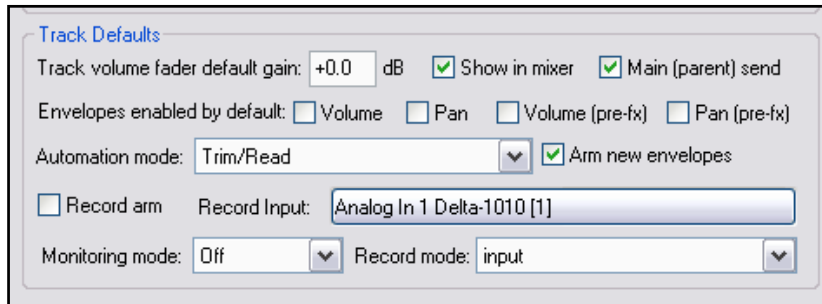


Available options include:

- To scroll track view while recording.
- To display a preview of media item peaks as they are being recorded. This is useful to confirm that you really are recording and haven't, for example, forgotten to arm one or more tracks.
- To automatically display the whole Track Control Panel (including VU meters) when a track is armed.
- When to add recorded media to a project when loop recording.
- Whether to prompt to save files when recording is stopped. If you disable this option, files are automatically saved.
- Prevent recording from starting if no track is armed. You may wish to turn this off if you are using layered recording for a track (or tracks) where recording is not required to start until some way into the song.
- To specify a default path for your recorded files. This can help you to keep track of your work.
- Which items to include in the file names for recorded media – you can include any combination of the track index number, the track name and the time stamp (or none of these).

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3.30 Track Preferences for Recording



The REAPER **Track Defaults** settings includes a number of items that you can use to help make the recording process a little easier.

These settings can be found on the **Project Defaults** page of the **Options, Preferences** window.

Settings on this page include:

- Whether new tracks are automatically armed for recording when they are inserted.
- Which Mono, Stereo or MIDI source is to be used as the default input source for new tracks.
- Whether Input Monitoring should by default be on or off for new tracks.
- Which Record Mode should be the default for new tracks.

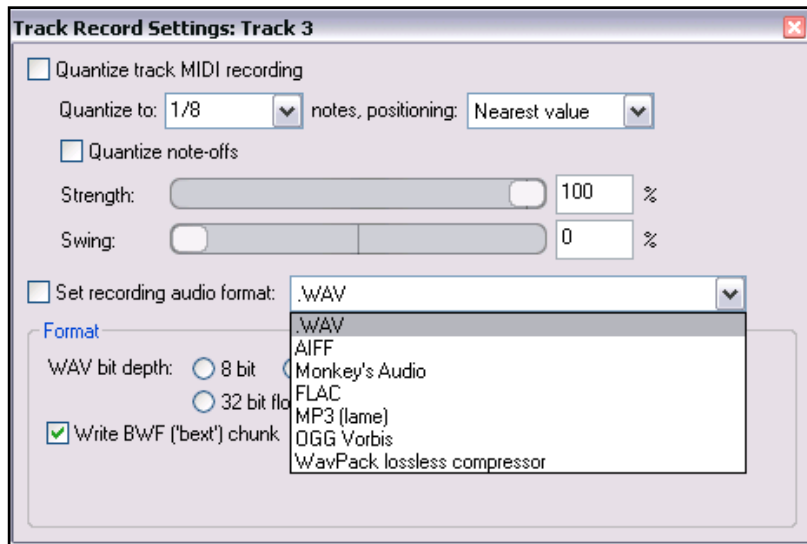
3.31 Recording with Mixed Formats

REAPER allows you to use different recording formats for different tracks in the same file.

The default format for each new track that you create will be determined by your **Project Settings**. To change these for any track, simply right click over the track's VU meter, then from the menu choose **Track Recording Settings**.

You can choose any of the formats **WAV, AIFF, Monkey's Audio, FLAC, MP3, OGG Vorbis**, or **WavPack lossless compressor**.

Depending on which format you choose, you will be presented with a range of options appropriate to that format.

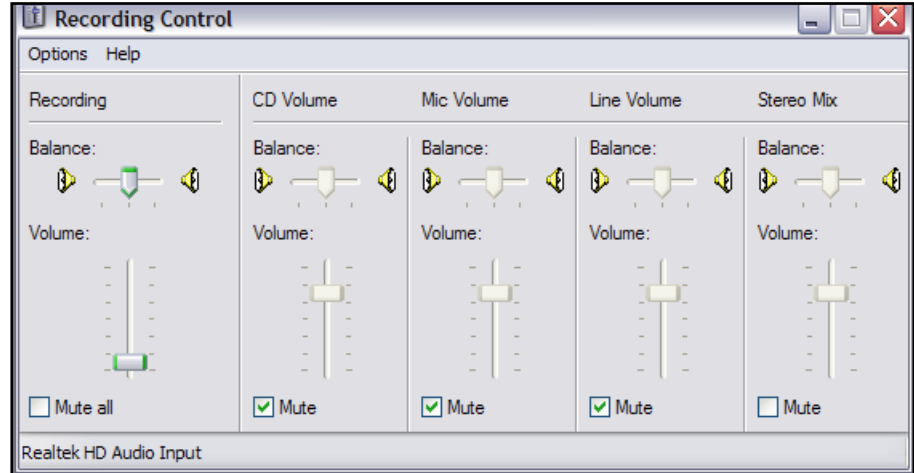


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3.32 Recording an Internet Audio Stream

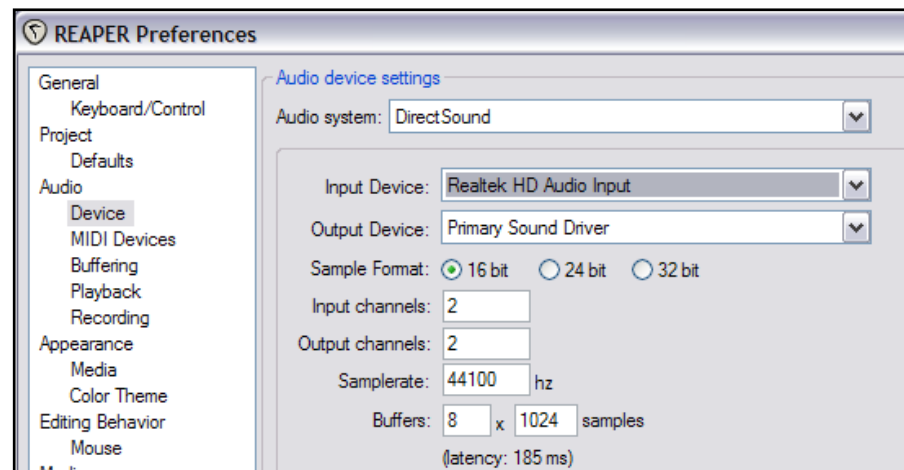
You can use REAPER to record any audio stream that you are receiving over the internet. Of course, before doing so you should make sure that you are not in breach of any copyright restrictions.

The exact method required will depend on your hardware setup, including your sound card. Your sound card will be provided with some sort of software for changing its settings. This may or may not have its own icon within the Windows Control Panel. If you are not sure how to access it, you can click on the Windows **Start** button, choose **Run**, then type **sndvol32 -r** and press **Enter**.



In overview, these are the steps that you will need to perform.

1. Access your sound cards control software and 'modify its settings to select (depending on the options available) either **Stereo Mix** or **What You Hear**. Shown above is an example of the settings for a Realtek sound card. In this example, input from all, other sources (Microphone, Line, etc) has been temporarily disabled.
2. Open your web browser and find the page containing the item that you wish to record.
3. Open REAPER, create a new file and add a track.
4. The next step may require a little experimentation. Depending on the equipment you are using, it might be necessary to change your **Options, Preferences, Audio, Devices** settings to **Direct Input**. An example is shown here.
5. Arm your track for recording, making sure to select the correct input.
6. Press **Ctrl R** to start recording. In your web browser, play the item that you wish to record. When finished, stop recording and save your work.


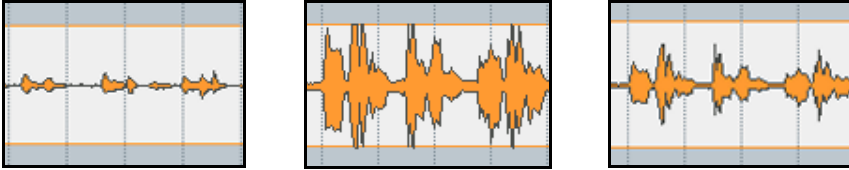


Note: Don't forget when you have finished, to restore both your Sound Card Recording Control options and REAPER's Audio Device Preferences to their previous settings.

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3.33 REAPER Audio Recording Checklist

The following checklist should be taken as guidelines only. In many cases you can vary the suggested order (for example, you can switch on your PC and start REAPER before getting together your microphone and leads if you wish). In other case the order is critical (for example, you should always connect your microphone to your preamp before turning on the phantom power supply). If you are not sure, the safest thing to do is to keep to the exact same sequence outlined here.

Item	Comment
Preparation	<p>Set up all external recording equipment needed (microphones, stands etc).</p> <p>All faders and gain controls on mixer and/or sound device turned right down.</p> <p>Phantom power (if available) turned off.</p> <p>Everything connected that needs to be connected (e.g. microphone leads to mixer or sound device).</p> <p>Turn equipment on.</p> <p>Connect headphones to headphone amp or sound device.</p> <p>If phantom power required (for condenser microphone), turn it on.</p>
PC Preliminaries	<p>Turn on PC and wait for Windows to open.</p> <p>Open REAPER with required project file. Save file.</p>
Project Settings	<p>Check recording format and settings – e.g. 24 bit WAV at 44100 Hz.</p> <p>Is a different format required for this track?</p> <p>Make sure Record Mode is set to Normal.</p>
Track Settings	<p>Named and armed for recording?</p> <p>Track Input Monitoring on or off? Use the Sound Card's direct input monitoring if available in preference to REAPER's.</p> <p>Record Input selected?</p> <p>Correct input channel selected?</p> 
Test Recording Levels	<p>Start low and work up.</p> <p>Record a small sample to test levels: the examples below show too low, too high and about right. It is better to be too low than too high.</p> 
Recording	<p>Press Ctrl R to record and again to stop recording when finished. Save media items.</p> <p>Press Ctrl S to save project file.</p>
Evaluating	<p>Unarm track before playing back recorded tracks to evaluate them.</p> <p>Especially if listening through headphones, disable Input Monitoring (or turn faders and gain controls on the input device right down), to prevent live ambient sounds from being mixed in with your recorded material.</p>

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Notes

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4 Project Arrangement Basics

4.1 Managing Tracks

In Section 2, we introduced some very basic REAPER track management features, such as Volume, Panning, Mute and Solo. In this section, we will be exploring these features in more depth, as well as introducing some more.

Remember that at any time you can use **Ctrl Z** to undo your last action. REAPER's Undo capabilities are described in more detail later in this section.

Tip: Before continuing, you might wish to open the supplied project file **All Through The Night.RPP** and save it to a new name such as **All Through the Night**

EDITS.RPP. You can then use this file to try out and experiment with some of the ideas presented in this section.

Insert track...	Ctrl+T
Remove selected tracks	
Duplicate selected tracks	
Copy selected tracks to clipboard	
Cut selected tracks to clipboard	
Save selected tracks as track template...	
Render selected tracks to stem tracks (and mute/bypass originals)	
Insert track from template	
✓ Show selected tracks in mixer	
Set selected track colors to custom color...	
Set selected track colors to random colors	
Set selected track colors to one random color	
Set selected track color to default	
Set selected track automation mode	
Set automation mode for all tracks	
Show master in track view	Ctrl+Alt+M

Copying, Deleting Moving and Ordering Tracks

A number of techniques can be used for carrying out these various track management tasks.

Task	Method
Move a track up or down the track order	Click on or around the track number, then click and drag the track up or down the track list, then release the mouse. All media items are moved with the track.
Move two or more adjacent tracks up or down	Select the control area for all required tracks. To do this, click on the track number for the first track, then hold Ctrl while clicking on the track number(s) of the other tracks. Then click and drag up or down. All media items are moved with the tracks.
Delete a track	Click on or around the track number, then press Delete , or right click (see menu above) and choose Remove selected tracks . All media items are removed with the track.
Delete two or more tracks	Use Ctrl with the left mouse click to make your selection, then press Delete , or right click and choose Remove selected items . All media items are removed with the tracks.
Copy a track as the next track	Right click over the track number, choose Duplicate selected tracks . All media items are duplicated with the track. To do this with more than one track, select all required tracks first.
Copy a track to a specified location	Click on the track number. Press Ctrl C . Move to the required location then press Ctrl V . All media items are duplicated with the tracks. To do this with more than one track, select all required tracks first.
Display the Master in Track View	Right click anywhere in the Track Control Panel area, below the last track. Choose Show master track . The keys Ctrl Alt M can be used to toggle this display on and off.

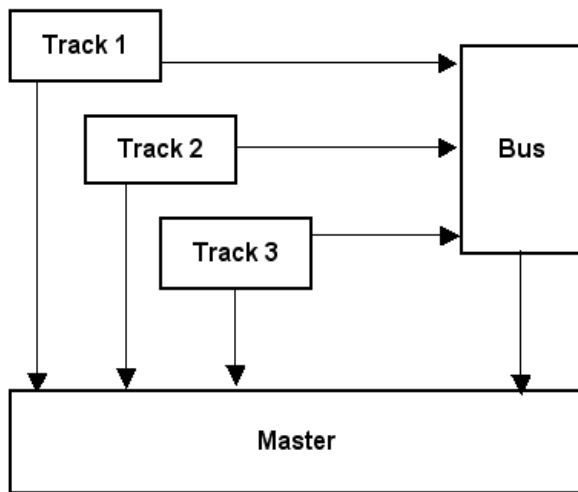
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4.2 Folders, Sends and Busses

In Section 2 of this User Guide, you were shown how to create a track and use it as a bus, for example to add the same reverb effect to a number of tracks. The signal flow that we created can be represented by the following diagram.

Reaper Routing Examples

1. Sending to a Bus with Master/Parent Send Enabled on Tracks



The sends that you create for each track send a portion of the signal to the Bus track, which applies the effect, and then sends the processed (wet) signal on to the Master.

At the same time, so long as the **Send Master/Parent** option within each track's I/O window remains ticked, the dry signal for each track is also sent directly to the master, where it is mixed together with the signal from the Bus.

If you were to turn off the **Send Master / Parent** option for your three tracks, then your Bus effectively becomes a submix.

However, REAPER offers you an often smarter way of creating a submix, which is to use Track Folders. You will be shown how to do this in the section that follows.



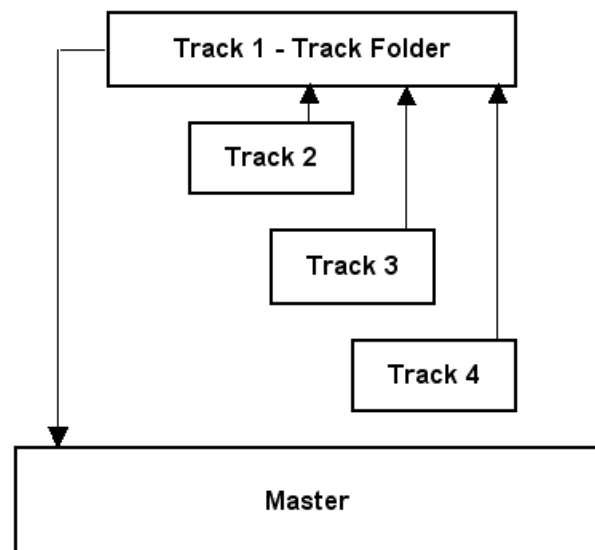
Before we do this, however, let's first get a handle on the basic concept of what a Track Folder is and how it works.

In essence, a Track Folder is a track that acts as a submix for all of the tracks within it. In the case of child tracks inside a parent Track Folder, the **Send Master / Parent** option directs the output of individual tracks not directly to the Master but to the Track Folder. Thus, output of all tracks from a track folder goes to the Master but via the Track Folder.

The illustrations (above and right) show one track folder (parent) which contains three child tracks.

Reaper Routing Examples

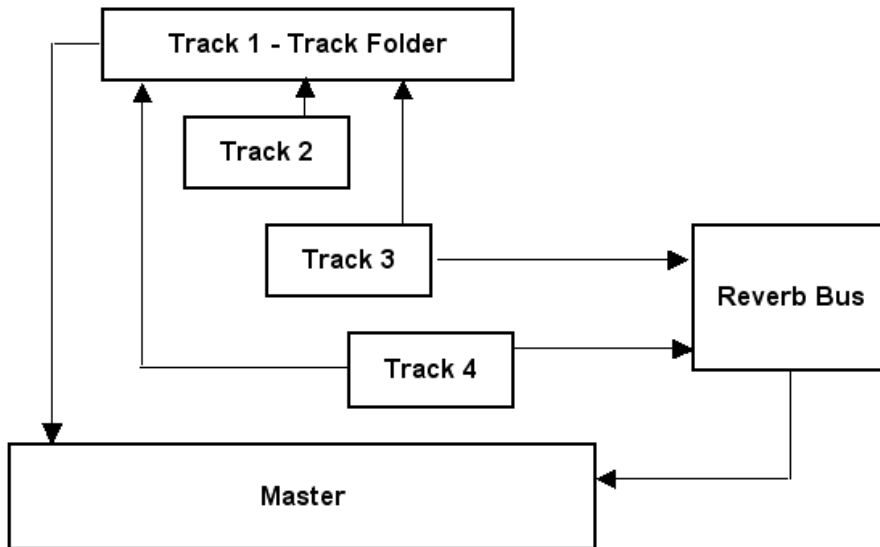
2. Using a Track Folder



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Reaper Routing Examples

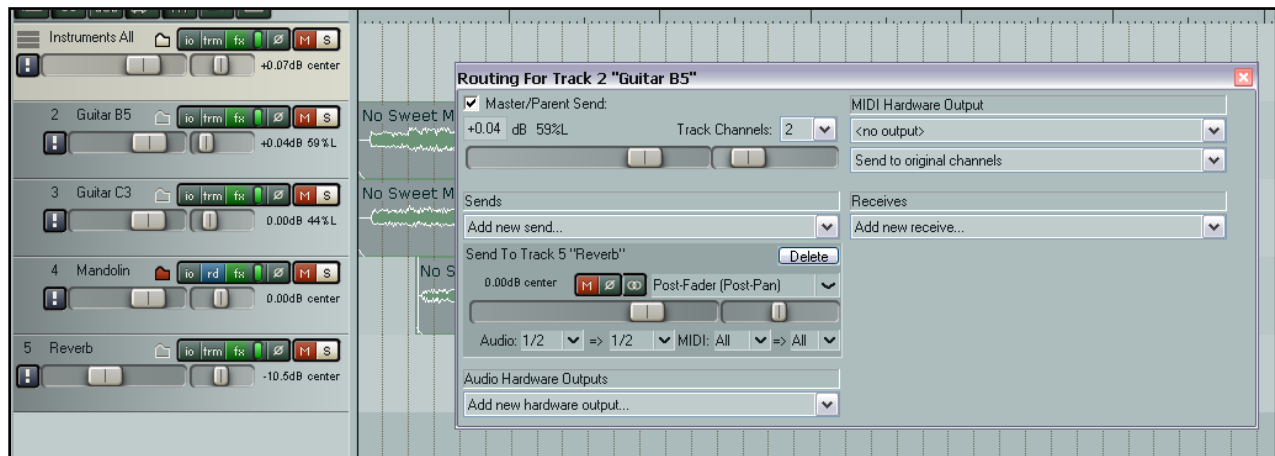
3. Using a Track Folder and Auxilliary Busses



This third example (left) shows three tracks within a folder, where two of the three tracks also use a send to send a portion of their track signals to a Reverb Bus.

This reverb is then mixed in (at the Master) with the signal sent there from the Track Folder.

The illustration below is of the project represented by the above flow chart. It shows the track structure of the project, together with the I/O window for one of the tracks.



As you get to use REAPER more and more, you will see that its routing capability is one of its greatest strengths. More complex examples of track routing, including how to create and use **Nested Folders** are considered later in this User Guide.

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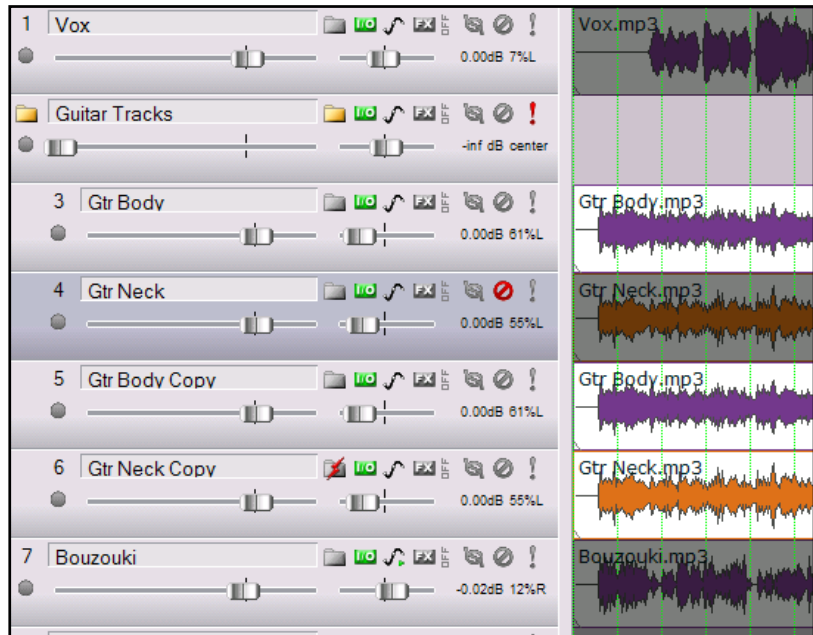
4.3 Creating and Using Track Folders

Folders can be used to group tracks together. When a number of tracks are grouped together in this way, the folder controls can be used to control all tracks in the folder.

For example, you can use the **Volume** controls for individual tracks within a folder to set the *relative* volume levels for the different tracks. You can then use the Volume control for the folder to control the overall combined volume level of the tracks in that folder.

Another example is that the **Mute** and **Solo** controls for the folder will cause all tracks in the folder to be muted or soloed.

In addition, you can, of course, continue to use each track's individual Mute and Solo controls.



The example illustrated (above right) shows a folder called **Guitar Tracks** that contains four individual tracks. The folder itself is soloed, and one of the tracks within the folder is muted. This results in only three of the tracks being heard when the song is played.

To create a track folder, follow this sequence:

1. Create a new track in the Track Control Panel above the tracks you wish to group together. This will become a Folder Track and control the Master output levels of all of the channels within its Folder.
2. Click on the Folder button of the new track. The Folder button icon will change to Yellow, indicating that it is now a Folder Track.
3. Click on the Folder button of the last track that you want to be included in the Folder (Track 6 in the example above). The Folder button will show a red x, indicating that it is now the last track within the Folder. All tracks below the Folder Track and up to this track will now be routed through the Folder Track instead of the Master send. Tracks within a Folder are indented within the Track Control Panel.
4. The Master send level of all of the tracks within the Folder is now controlled by the Folder Track.

In addition, note the following:

- REAPER can accommodate multiple Folder Tracks, but will not let you create a Track Folder within an existing Track Folder. You can, however, create nested folders manually to overcome this – see the section *More REAPER Routing Examples*.
- Folder Tracks can be sent to other tracks/outputs, and have their own FX chain. The audio from the tracks in the folder passes through the folder track's FX - this makes a quick way to apply a common effect to a group of tracks, such as applying reverb to a set of drum tracks.
- Folder Tracks can be routed to other Folder Tracks.
- You can hide or minimise the height of the sub-tracks within the Folder by clicking on the Folder View button. This button, located to the immediate left of the folder name, toggles between the different states.
- The order of Folder Tracks can be altered by dragging and dropping the Folder Tracks within the Track Control Panel.

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- You can use Folder Tracks to create "Stem" mixes. A Folder Track is routed to the Master send by default, but you can send Stem mixes to separate hardware outputs (in addition to the Master send) by clicking on the I/O button of the Folder Track and selecting an Audio Hardware Output.

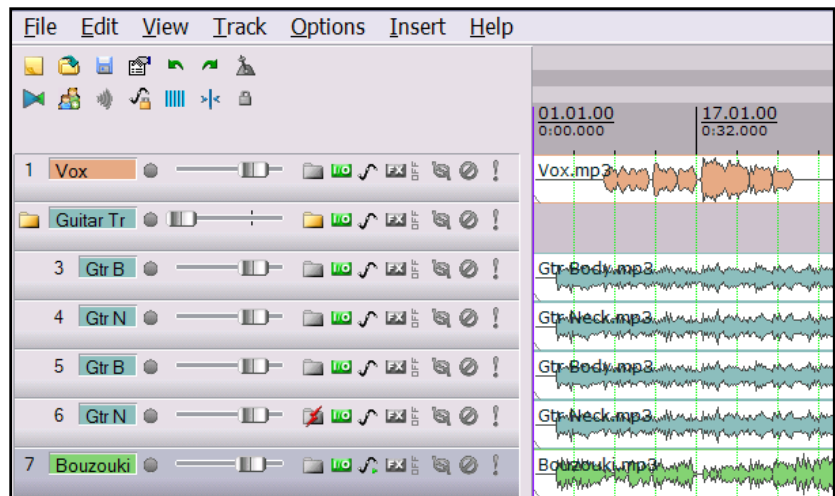
4.4 Track Colours

Besides keeping tracks together in folders, you can use colour as an effective means of helping you visually identify the relationship between different tracks.

To do this, simply select the track (or tracks) in the Track Control Pane, then right click and use any of these commands:

Command	Effect
Set selected track colors to custom color...	Opens a Colour Selection dialog box for you to select a color for the track's media items.
Set selected track colors to random colors ...	Sets the media items for each track in the selection to a different randomly chosen colour.
Set selected track colors to one random color ...	Sets the media items for all tracks in the selection to the same randomly chosen colour.

The illustration (right) shows an example of how different colours can be used to help identify different tracks and groups of tracks.



4.5 Colour Themes

REAPER also supplies a number of colour themes that you can use to present your projects attractively.

To select from the themes supplied with REAPER, use the **Options, Color Themes** command.

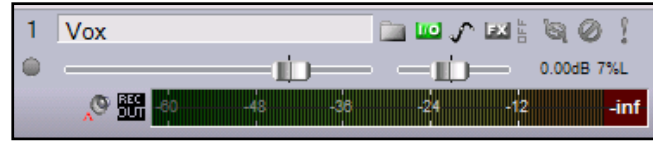
In addition, a very large number of themes are available in the **Theme Pack**. This is available for free download at <http://www.cockos.com/reaper/download.php>

You can also visit the REAPER User Forums for more themes.

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4.6 Track Control Modifiers

Four features used extensively in auditioning tracks are, of course, the **Volume** and **Pan** faders and the **Mute** and **Solo** buttons. The basic functions of these controls has been covered in Section 2. However, REAPER gives you additional functionality by using modifier keys with these controls:



Volume Controls

Modifier Key	Effect
Alt	When mouse is released, fader returns to its original position.
Ctrl Shift	When more than one track is selected, only the control for the current track is affected.
Ctrl	Allows for more precise control of fader level.
Double click	Reset to zero.

Pan Controls

Modifier Key	Effect
Alt	When mouse is released, fader returns to its original position.
Ctrl Shift	When more than one track is selected, only the control for the current track is affected.
Ctrl	Allows for more precise control of fader level.
Double click	Reset to centre.

Mute Controls

Modifier Key	Effect
Shift	When more than one track is selected, only the current track is toggled.
Ctrl	Clears all mutes.
Alt	Unmutes selected track(s), mutes all others.
Ctrl Alt	Mutes selected track(s), unmutes all others.

Solo Controls

Modifier Key	Effect
Shift	When more than one track is selected, only the current track is toggled.
Ctrl	Clears all solos.
Alt	Solo selected tracks only, excludes output from any sends.
Ctrl Alt	Solos selected track(s), unsolos all others.

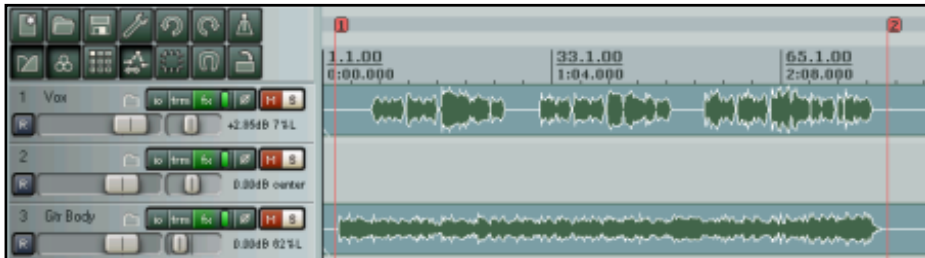
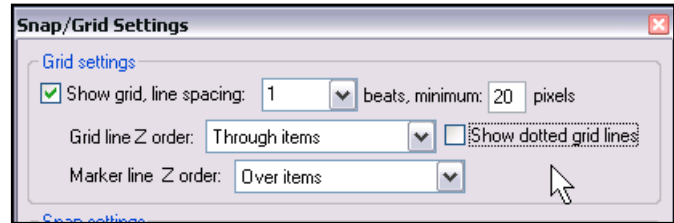
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4.7 Displaying Grid Lines

REAPER lets you determine whether or not to show grid lines in your projects. If you choose to show them, you have a number of options to determine how they are displayed. The preference is a personal one. In this section we will look at three examples of how you might choose to use grid lines if you wish.

The display of grid lines is toggled on and off using the **Options, Show grid** command or the keyboard shortcut **Alt G**. Grid line settings are accessed via the **Options, Snap/grid settings** command or the keyboard shortcut **Alt L**.

The examples below illustrate the effects of various permutations of grid setting options.



Show grid disabled.

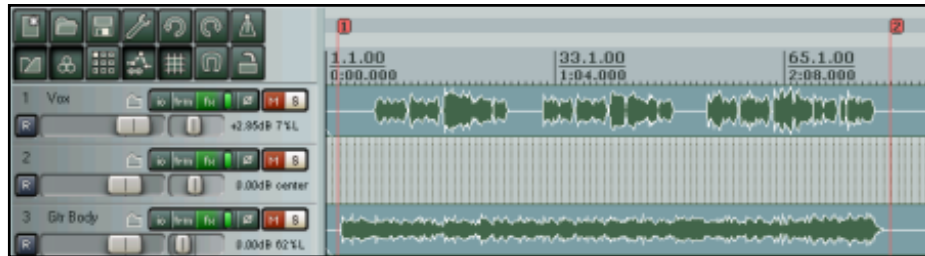


Show grid enabled.

Spacing 1 beat, minimum 20 pixels.

Grid line through items, Marker line over items.

Dotted grid lines not selected.

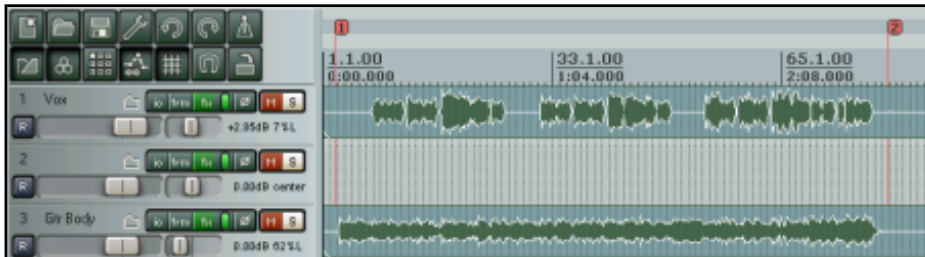


Show grid enabled.

Spacing 1 beat, minimum 5 pixels.

Grid line under items, Marker line over items.

Dotted grid lines option selected.



Show grid enabled.

Spacing 1 beat, minimum 5 pixels.

Grid line over items, Marker line under items.

Dotted grid lines option selected.

Later in this User Guide, you will be shown how you can use your grid settings to automatically snap various REAPER objects and items to position.

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4.8 Creating Keyboard Shortcuts

In Section 2, we introduced the idea of [creating your own keyboard shortcuts](#), together with one or two examples. Many power users believe that keyboard shortcuts are the fastest, most efficient and most productive way of working with REAPER. This is especially the case for frequently repeated activities that might otherwise involve a lot of time fiddling around with the mouse.

Keyboard Shortcuts are an extremely important feature of REAPER. As you work your way through this User Guide, and as you get to know REAPER better, you will find that there are all sorts of actions that you can assign to keyboard shortcuts, *including several that do not appear on any menus*.

To define your own keyboard shortcuts, choose the **Options, Preferences** command, then display the **Keyboard Control** settings. The technique for doing this is explained in detail in [Section 2.8](#).

Here are some examples of some tasks for which you might consider it worth assigning shortcut keys, together with suggested keys that you may wish to use.

Task	Possible Shortcut Key
Toggle bypass FX for currently selected track(s)	B
Toggle bypass FX for all tracks	Y
Show Inputs/Output window for selected track	I
Show Envelopes window for selected track	E
Show FX Window for selected track	F

As you will see later in this section, more complex assignments of keyboard shortcuts are also possible, including the assignment of a single keystroke to execute a series of tasks.

4.9 Using a Control Surface for Keyboard Shortcuts

We are now going to take the idea of keyboard shortcuts a big step further, by introducing you to the use of a Control Surface device to act effectively as an extension of your computer keyboard.

For example, you can use the faders, rotaries and buttons of a Control Surface such as a Behringer BCR2000 (or other USB Device) to control track panning and volume, mute and solo status, and even to physically map REAPER's transport bar, for functions such as Play, Stop, Pause, Rewind, etc.

In this section, we will use the example of a BCR2000, but it should be possible to do this with any similar device by using these instructions as a guide.

In overview, this is the sequence that you should follow:

1. Create a complete set of presets for your BCR2000 (or select one of those supplied with the device). We will call this Preset 1. Check that the settings for this set of presets is all right for the task.
2. Start REAPER. Go to **Options, Preferences**. Display the **MIDI Devices** settings page, and make sure that your BCR2000 is set to both Enabled and Control.
3. Still in the **Preferences** window, display the **Keyboard/Control** page, and create new keyboard shortcuts for the required items, each time assigning control to one of your BCR2000 rotaries or buttons.

Be prepared to spend about an hour or so setting up your Control Surface device in this way. It will be one of the best investments of time that you'll ever make.

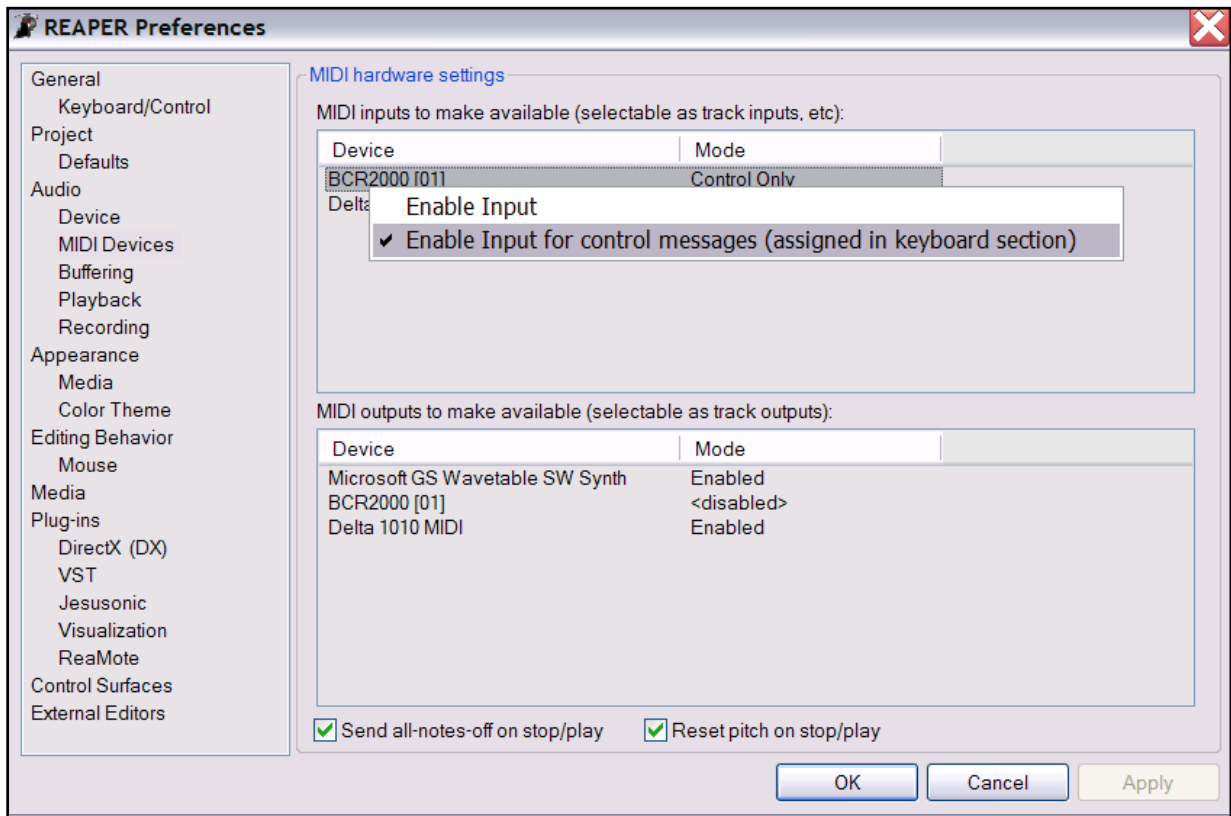
A detailed example is explained on the next page.

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Enabling the Control Surface

You will need to install the Control Surface as a MIDI Device. To do this, follow the sequence explained below.

1. Choose the **Options, Preferences** command.
2. Select the **MIDI Devices** screen.
3. Select the BCR2000 (or equivalent) and make sure that its Input state is set to **Control Only**. To do this, disable the **Enable Input** option and enable **Enable Input for control messages (assigned in keyboard section)**, as shown below.



4. Choose **Apply**, then **OK** to close the Preferences window.
5. Close REAPER (for now).

Note: Contrary to what you might expect, you do **not** need to also install the device in the Control Surfaces screen of REAPER Preferences.

The Control Surface Presets

You need to ensure that values are assigned to each of the rotaries, faders and/or buttons that you wish to use.

If the device is shipped with factory presets, you can use these. Otherwise you will need to set up your own.

For the BCR2000, the BCEDIT program is available both for importing factory presets and for creating your own presets. Whether you are using this or some other device, consult the device's documentation.

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The BCR2000 Assignments

The illustration (right) shows a typical Rotary control assignment, displayed in the BCEDIT program.

This example is for Encoder 49, which is the leftmost rotary in the bottom row. We will be assigning this to control the Volume fader for Track 1 in REAPER.

The second illustration (below) shows a typical Button control assignment, displayed in the BCEDIT program.

This example is for Button 41, which is the leftmost button in the lowest row of buttons, just above the third row of rotaries.

Control Element	Encoder 49	Name	
Enc Accel.		Function	Enc
MIDI Data Type	Control Change	Minimum	0
Send Channel	1	Maximum	127
CC no.	6	Ctrl Mode	Absolute
Display Value	On	Ctrl Option	1 Dot

Control Element	Button 41	Name	
Enc Accel.		Function	Button
MIDI Data Type	Control Change	On-Value	127
Send Channel	1	Off-Value	0
CC no.	73	Ctrl Mode	Toggle on
Display Value	On		

We will be assigning this to control the Mute/Unmute toggle for Track 1 in REAPER.

After defining your various control assignments for your control device, be sure to save them as a preset and ensure that your preset is selected and active within the control device. For the sake of this example, we will refer to this as Preset 1.

Assigning the Keyboard Shortcuts to the Control Device

This is a lot easier that you might expect (especially if you have been using other DAW software), but it will take a little time.

Choose the **Options, Preference** command, and select the **Keyboard/Control** page.

1. To assign our first control, click on **New**, then scroll down the list and click on **Set Volume for Track 01 (midi CC only)**.
2. Click in the edit box labelled **Shortcut** then twiddle the Control Device rotary that you wish to assign to this task. In this example, if using a BCR2000, this will be Encoder 49.
3. Select the MIDI CC mode **Absolute**.
4. Click on **OK**.

New Keyboard Shortcut

Shortcut: MIDI Chan 0 CC 6 Special key (Enter, Tab, etc...)

Note: you can also assign shortcuts to MIDI events (by moving the controller here), if the MIDI inputs are enabled and set to "control" in the MIDI section of the preferences.

Actions:

Track: Set Volume for Track 01 (midi CC only)	Search...
<none>	Search...
<none>	Search...
<none>	Search...
<none>	Search...
<none>	Search...

MIDI CC mode: Absolute

OK Cancel

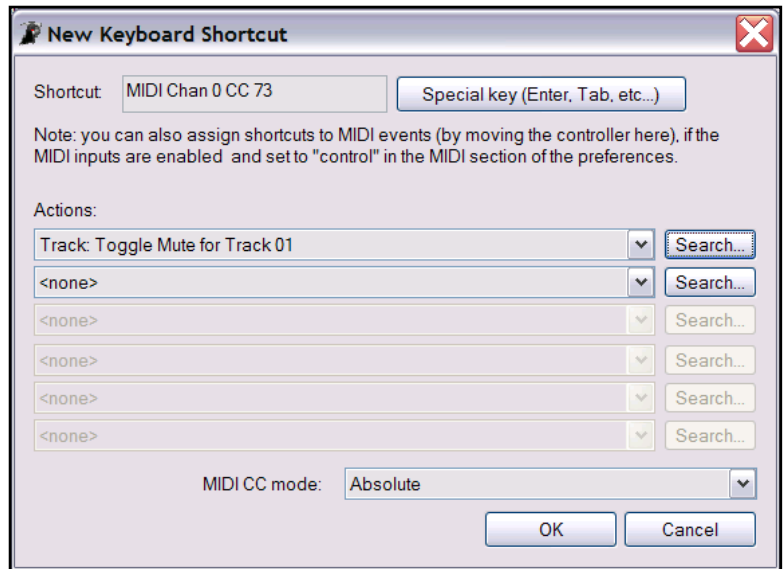
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- Now repeat steps 2. to 5., this time selecting **Track: Toggle Mute for Track 01** as the **Action**, and assigning Button 41 to this action. Again. Select **Absolute** as the required MIDI CC Mode.
- Repeat these steps for each action that wish assigned. With the BCR2000, you should be able to complete assignments as shown in the table below.
- When finished, click on **Apply** then **OK** to save your preferences and close the window.

Note: When control is assigned in this way, the control device will automatically follow the track number.

For example, if Track 1 is called **Vox**, then in this example, the controls for the first strip on your control device will control volume, etc for that track.

If you then insert a new track above this, so that **Vox** now becomes Track 2, then the second strip of controls on the control device will now control **Vox**, and the first strip will now control the new track.



Examples of suggested control assignments for the BCR2000

Controls	Function
Encoder 49 to Encoder 56	Volume, Tracks 1 through 8
Encoder 41 to Encoder 48	Pan, Tracks 1 through 8
Button 41 to Button 48	Toggle Mute, tracks 1 through 8
Button 33 to Button 40	Toggle Solo, tracks 1 through 8
Button 01 to Button 8 (Group 1)	Toggle Record Arming, tracks 1 though 8
Button 09 to Button 16 (Group 2)	Toggle FX Bypass, tracks 1 through 8
Button 49	Play Transport
Button 50	Stop Transport
Button 51	Pause Transport
Button 52	Start/Stop Recording

Tip: When you have successfully got this set up, within your BCEDIT program (or equivalent), you can make a copy of this set of presets, edit it (to change CC and/or Channel settings) and save it as Presets 2. You can then return to the Preferences, Keyboard/Control screen to assign the control device controls to operate within REAPER on Tracks 9 to 16.

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5 Managing Track and Item FX

We have already covered the basic techniques involved in using effects (Direct X and VST) with REAPER tracks. We are now going to look at some of the options that are available to help you manage and use your FX more effectively.

5.1 Grouping FX

FX can be grouped for your convenience in any way you wish. For example, if you have a number of different Reverb FX, you might wish to create a group called Reverbs. If there is a set of FX (for example, Sonitus) that you use frequently, you can create a separate group for them.

You can create as many groups as you wish, and the same plug-in can be placed in multiple groups. Thus, in the above example, you could place the Sonitus Reverb plug-in both in the group called Reverbs and in the group called Sonitus.

To create a FX group:

1. Use the command **View, Show FX Browser** or the keyboard shortcut **Shift F** to display the Add FX window. This window can be docked if you wish.
2. Right click where shown (right) and choose **Create new folder** from the menu.
3. Type a name for your folder, then press **Enter**.

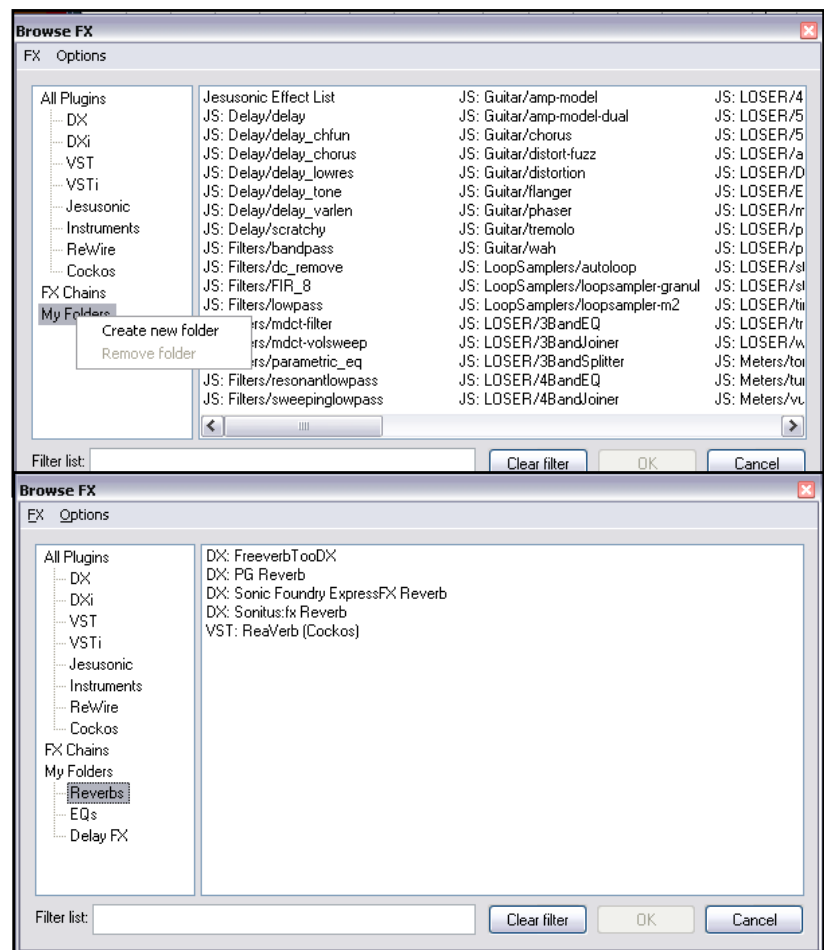
To add FX to a group:

1. Select the category **All Plug-ins** in the left hand panel of the FX window. This will ensure that all FX are available to you.
2. Drag and drop the required FX from the right hand panel to the folder into which you want the FX to be listed. You can use **Ctrl** with left mouse click to build up a multiple selection, then drag them all together.

To display and select from a group

1. Click on the name of any FX group to display its contents (see example, above).
2. Double click on any FX name within that group (listed in the right hand panel) to add it to the currently selected track.

Tip: If you leave the **FX Browser** open, you can add any FX to the currently selected track simply by double-clicking on the FX name within the browser – no need to click on the track's FX button first. A smart way of working is to leave the FX browser docked in the docker.



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5.2 Filtering Track FX

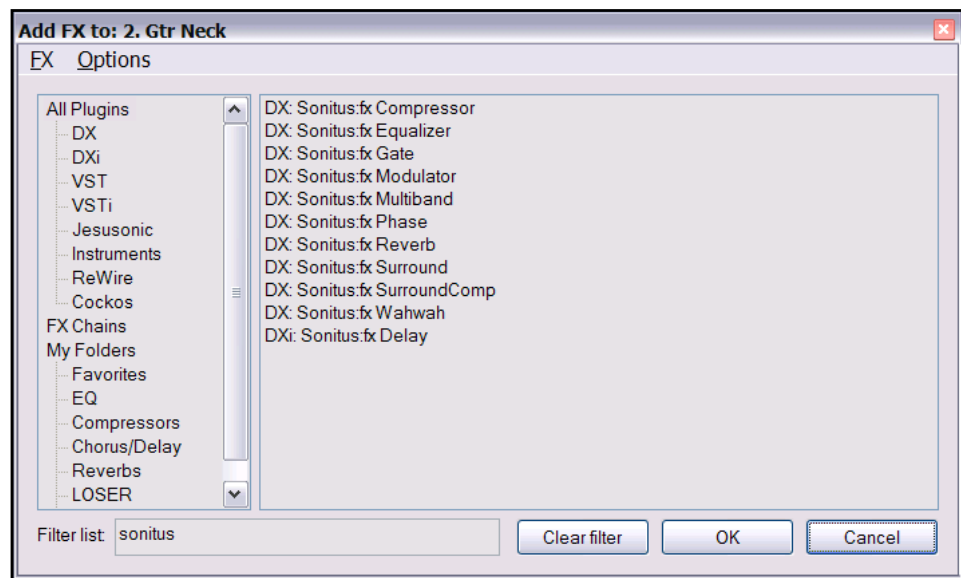
Even with the use of Groups, finding the right FX can still be time-consuming and frustrating if you have a large number installed on your system and are maybe looking for that something special for a particular track. That's where FX filtering can be useful.

By entering a text string in the **Filter list** text box in the **Add FX** window, you can immediately identify all FX which match your specified criteria.

Example 1

You want to experiment with adding some FX to a Guitar track – something time-based perhaps, perhaps something a bit different. You don't really know what FX it is that you want exactly. You think you've got good results in this area before using one of your Sonitus FX. But which one was it? (If you don't have any Sonitus plug-ins, substitute another type, e.g. LOSER, in this example).

1. Display the FX window for the track in question and click on the **Add** button. In the **Filter List** box, type *sonitus*
2. Notice (assuming of course that you have them), the names of all Sonitus FX, and only Sonitus FX, will be displayed.
3. Select as many of these as you wish (use **Ctrl** with left mouse click to build up a selection) then click **OK**.
4. You can now enable and disable these at will, experimenting as you wish.



5. Don't forget when finished to click on the **Add** button again, then **Clear Filter**.

Example 2

Suppose that you are looking for a Reverb Plug-In to use on a particular track, but you aren't sure which one to use. Try this:

1. Stop and think for a moment. What text string is likely to be common to the names of just about any Reverb Plug In that you might want to use? How about *verb*?
2. Display the FX Window for the track in question, click the **Add** button, then in the **Filter List** text box type *verb*
3. You can now select any of the Reverb FX displayed. You'll probably be surprised at how many you have!
4. Drag and drop the Reverb FX of your choice to the Track FX window.
5. Don't forget to click the **Clear Filter** button when finished.

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5.3 Copying Track FX

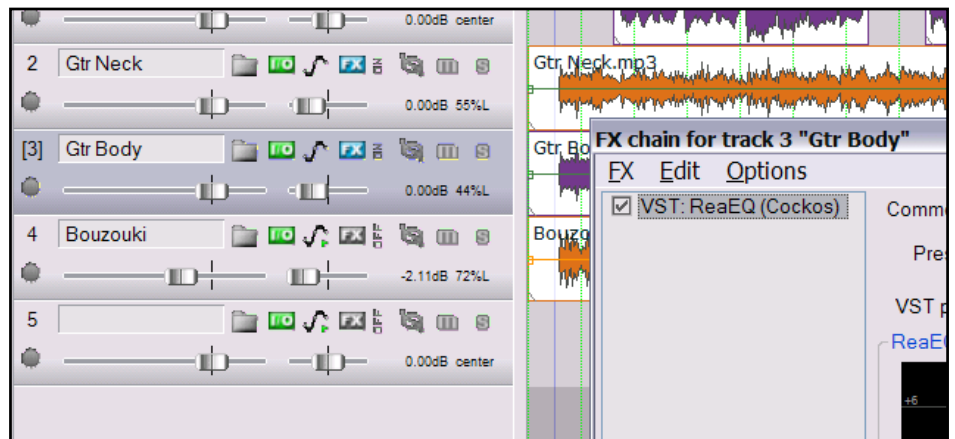
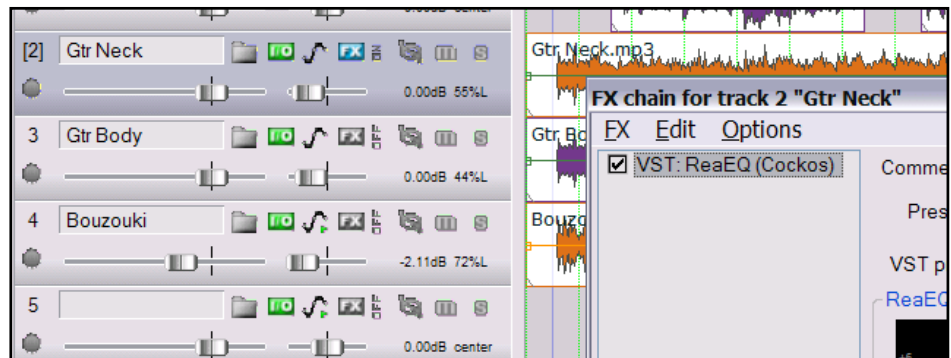
Any track FX can be copied from one track to any other track, or tracks. When a track FX plug-in is copied in this way, the settings and parameter values are also copied with it.

To do this, simply select the required plug-in the FX window of your source track, then use the mouse to drag and drop to the FX button of any other track. This can be done either in Track View or Mixer View.

Example

For this example, open the file **All Through the Night EDITS.rpp** that you saved earlier in this section. If you did not make this file, use any other file which has more than one track.

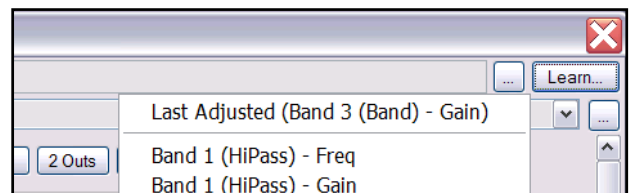
1. Click on the **FX Button** for the track **Gtr Neck** to open the FX Window for this track.
2. Insert the **VST ReaEQ(Cockos)** plug-in into this window (see right).
3. Hover the mouse over the text **VST ReaEQ**. Press and hold down the left mouse button and, holding it down, drag the mouse to point to the FX button of the **Gtr Body** track.
4. Release the mouse. The ReaEQ FX will now have been copied into this track.



You can of course repeat this as often as required to copy the same plug-in to other tracks.

Tip: If there are several plug-ins that you wish to copy from one track to another, you can select all the plug-ins (Click on the first then Shift Click on the last) and use this method to copy them all together.

Tip: If you click on the **Learn** button in any plug-in window, the top of the displayed list will remember which parameter was last adjusted.



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5.4 Renaming Track FX

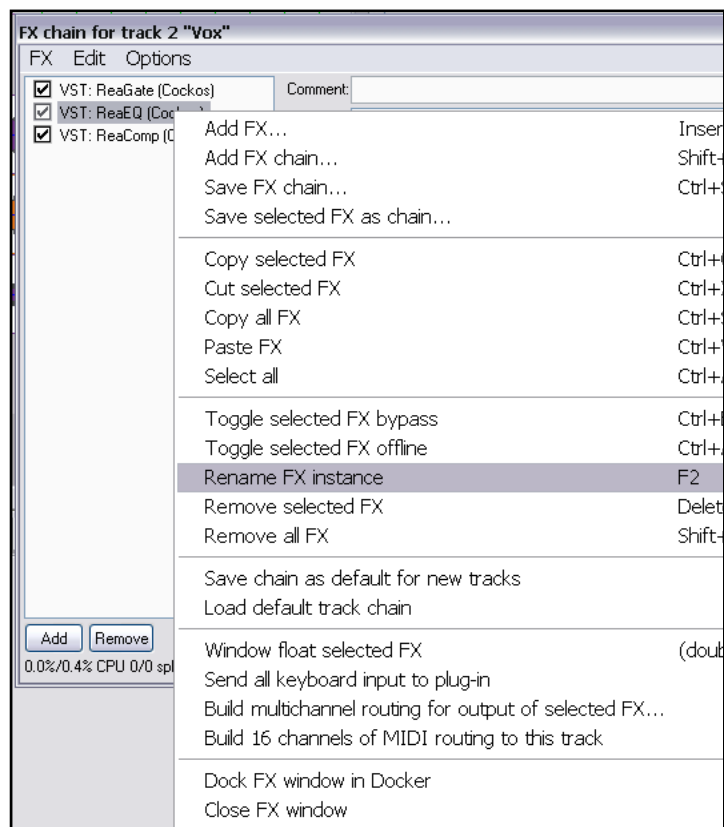
You can rename individual instances of FX Plug-ins so that the name that appears in the FX window in both Track View and in the Mixer reflects mixer displays a custom description of the FX purpose in that particular instance.

To do this, simply follow this sequence:

- Right click over the FX Item in either the FX Chain window, or the FX Bin in the Mixer view (see example right).
- From the menu, choose **Rename FX instance**.
- Type your custom name.
- Press **Enter**.

Note that your custom name will only be applied to that single instance of the FX Plug-in.

Other instances of the plug-in will not be affected.

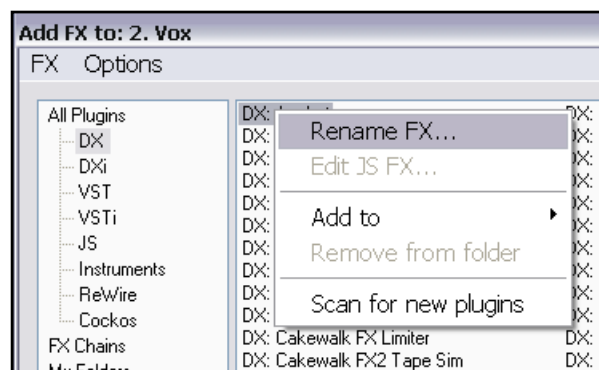


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5.5 Changing the Default FX Name

The default name of any FX plug-in can be changed by following a similar procedure to that outlined above, but this time selecting the Plug-in inside the FX Browser Window.

- Display the FX Browser Window (**View, FX Browser** or **Shift F**).
- Right Click over the plug-in that you wish to rename.
- Choose **Rename FX** from the menu.
- Type the new name.
- Press **Enter**.



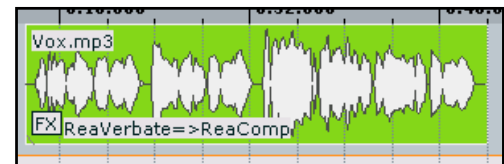
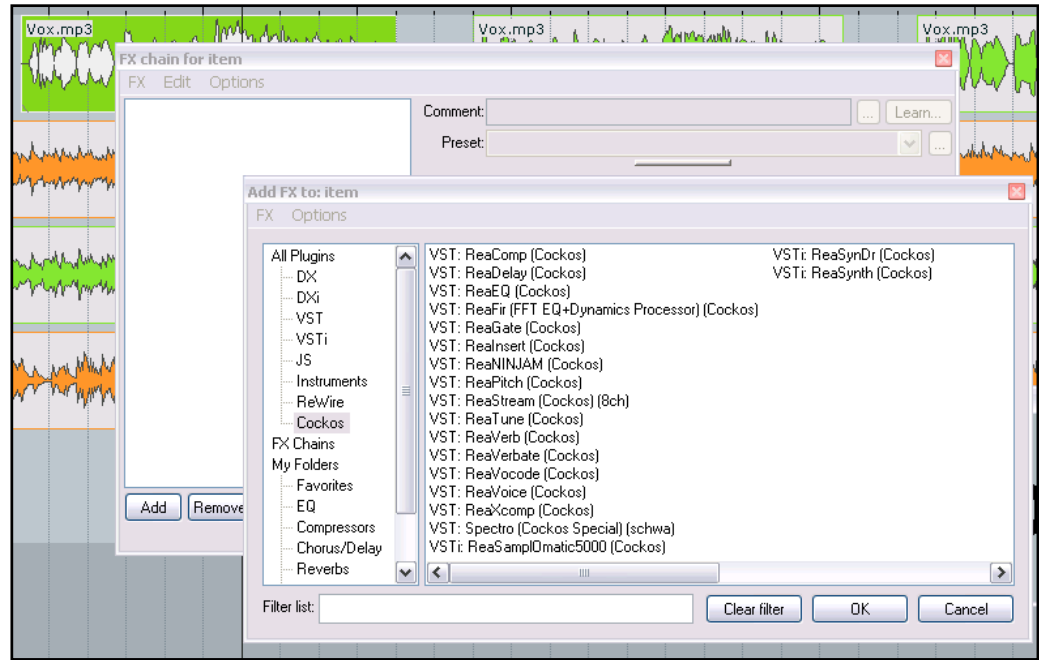
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5.6 Per Item FX

REAPER allows you to apply FX to individual tracks and also to individual media items within a track. This can be useful when a track, for example, consists of several media items, and you wish to add an effect (such as reverb or delay) to just one of the items only.

To add a plug-in to an individual media item, follow this sequence:

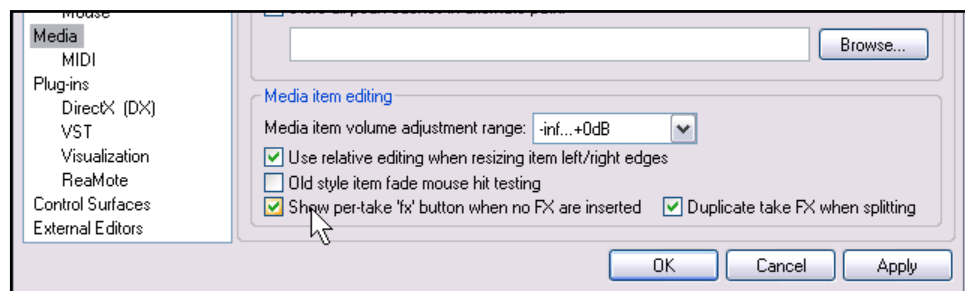
- Select the Media Item.
- Press **Shift E** to create and open an FX Chain for that item. The **Add FX to item** window will also be displayed.
- Double-click on the required Plug-In.
- Adjust the parameters to suit.
- Close the FX Window.
- Notice that by default, the Media Item will display an FX button, together with a chain which shows the names of all FX inserted in that media item (see right).



Managing Item FX

To do this ...	You need to do this ...
Make changes to an item's FX Chain	Click on the item's FX Button.
Delete an item's FX Chain altogether	Hold Alt while you click on the item's FX Button.
Copy an item's entire FX Chain to another item	Drag and drop the FX button from one item to another.

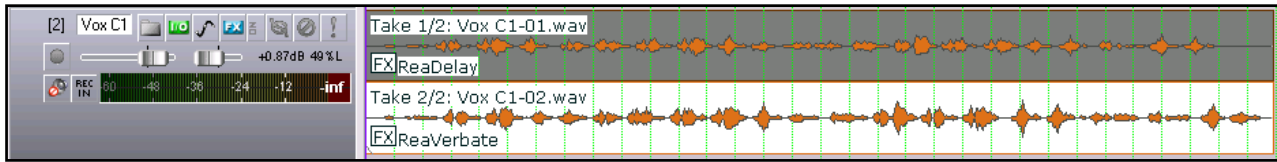
If you wish the FX button to be displayed for all items, even where no FX is present, select the option to **Show per take fx button when no FX are inserted**. This can be found near the bottom of the **Media** settings page within the **Options, Preferences** window.



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5.7 Using Item FX with Multiple Takes

When you use the Multiple Alternative Takes method of recording your tracks, each take is treated as a separate media item. This means that you can insert separate FX plug-ins into individual takes, as shown in the example below.



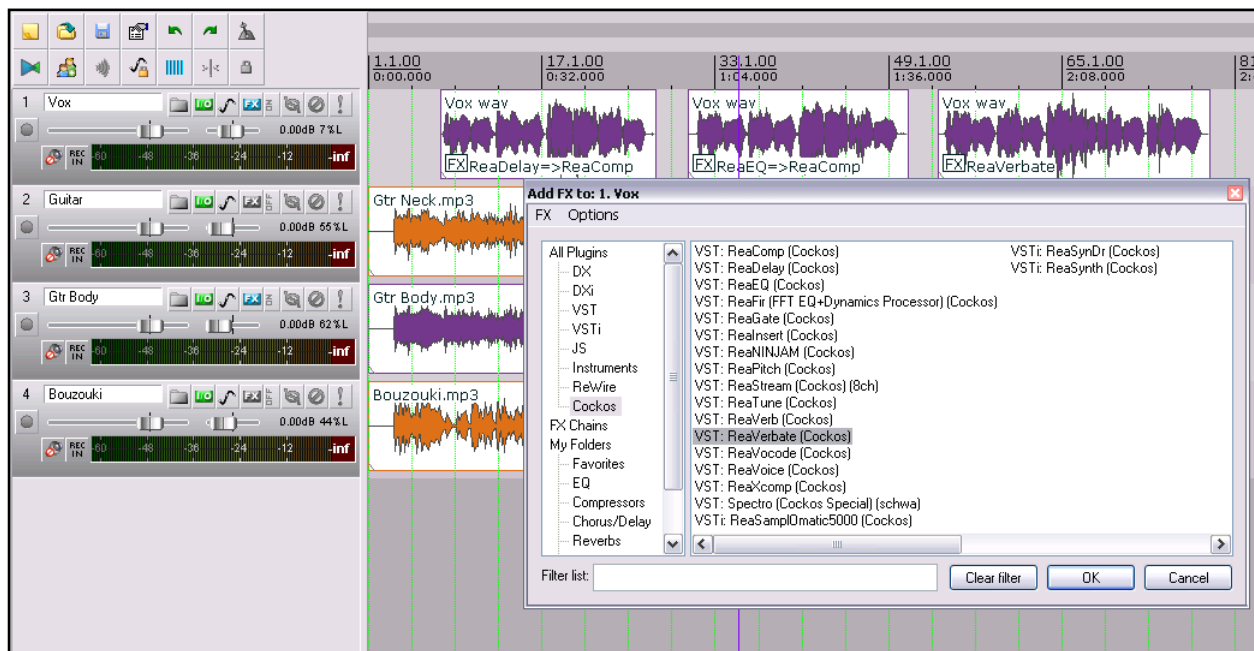
Of course, you can insert the same FX into each take and apply different parameters and settings for each one. If you wish to apply an FX with common parameters and settings to all takes in a track, you should insert it in the FX Chain for the track rather than for individual takes.

5.8 Adding FX to Multiple Items

If you have several media items to which you want to add various different plug-ins, it might not always be convenient to be constantly opening and closing the different Item FX Windows.

In this event, you can make life a little easier for yourself by following this method:

- Press **Shift F** or use the **View, FX Browser** command to display the **Add FX** (FX Browser) Window.
- You can now drag and drop any FX from the Browser Window to any media item or media items as required. Do this as many times as you wish, then close the FX Browser Window when finished.



Tip: Remember that you can keep the FX Browser window docked in the docker if you wish. If you use the docker to display the FX Browser window, then create a Windows Screen Set for that view, pressing the shortcut key for that Screen Set will automatically restore the FX Browser to the front of the docker.

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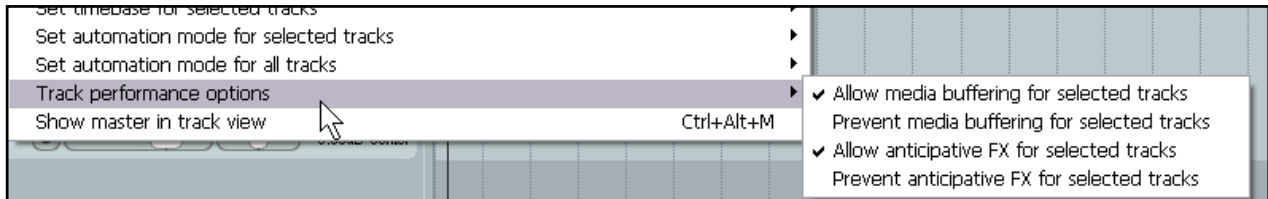
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6 Editing Tracks and Items

6.1 Individual Track Performance Options

With any DAW individual third party plug-ins can have unpredictable and unwanted side effects, especially with regard to audio performance. It is not that unusual for people to experience difficulties with a particular plug-in, which can appear to produce pops and crackles or dropouts at times, or even just make it not possible to play the song.

If you encounter this problem, the solution might well lie in trying out some of the track performance options.



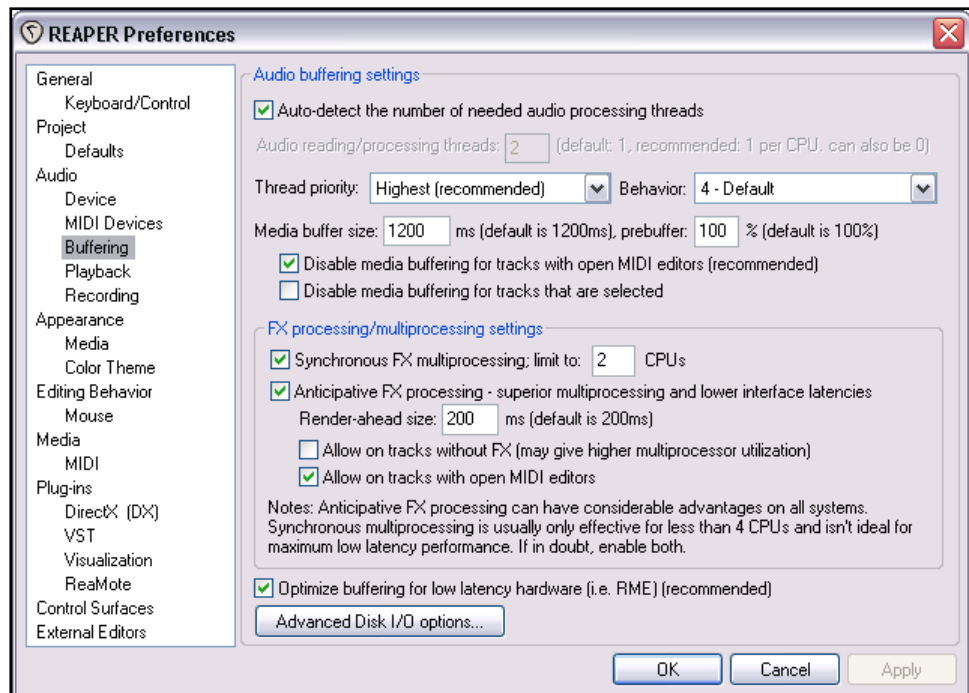
The options (under Options, Preferences, Audio Buffering) to use Anticipative FX and Media Buffering are discussed elsewhere. If you encounter any problems with an individual track, however, you can right click over that track in the Track Control Panel and turn either or both these options off for that track.

To turn either feature off:

- Right click over the track in the Track Control Panel.
- Choose **Track Performance Options**.
- Choose **Prevent media buffering for selected tracks** or **Prevent anticipative FX for selected tracks**.

To turn either feature back on:

- Right click over the track in the Track Control Panel.
- Choose **Track Performance Options**.
- Choose **Allow media buffering for selected tracks** or **Allow anticipative FX for selected tracks**.



Notice that when either feature is turned back on, the exact settings (such as **Buffer Size**) that will be applied are determined by those specified in the **Preferences, Audio, Buffering** window.

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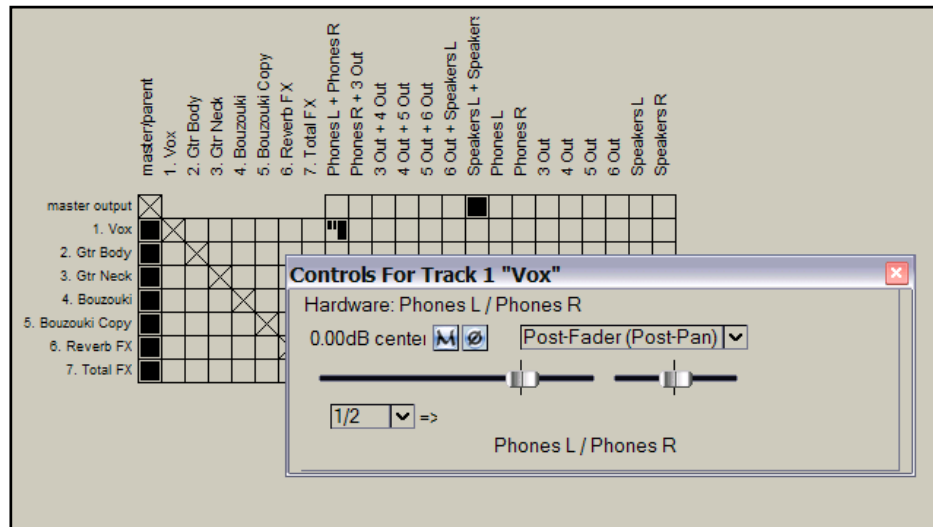
6.2 Headphone Monitoring

While you are listening to and evaluating your mix, it's usually recommended practice to use the monitors (speakers) in your control room.

Additionally, however, you may wish to use headphones, perhaps to listen for particular details on a particular track.

Assuming that you have a PCI sound card or other audio device (Firewire or USB) which supports multiple outputs, here's a neat little trick.

1. Assign **Output Aliases** to your outputs, as [explained in Section 1.9](#)
2. Display your **Routing Matrix** and assign the output from the Master to the Control Room speakers.
3. Put on your headphones.
4. As you play the song, click on the appropriate cells on the routing matrix to also direct any particular track on which you wish to focus to your headphones. Of course, you can change from track to track, or add as many or as few as you want at any time.



In the example shown (above), the entire mix (from the Master) is being heard through the Speakers, but only track **1 Vox** is being heard through the headphones.

Remember that you can right click over this grid cell to display the controls for this send (such as Volume).

This can be also a good technique to use when you have with you a musician who wants to particularly hear his own track while you are mixing!

Furthermore, when you are mixing down, you might not wish to see all of the available routing information available – it can get quite complex. You might wish to keep the routing matrix display as simple as possible for the job in hand. For example, if you are focussed purely on mixing, you might not need to see all the various input assignments.

Right clicking over the background area lets you customise its display. In the example shown here, by unchecking **Show audio hardware as sources** we have simplified the display.

- ✓ Show master/parent as destination
- ✓ Show tracks as destinations
- ✓ Show audio hardware as destinations
- ✓ Show ReaRoute as destinations
- ✓ Show master as source
- ✓ Show tracks as sources
- Show audio hardware as sources
- ✓ Show ReaRoute as sources
- ✓ Dock routing window in Docker
- Close Window

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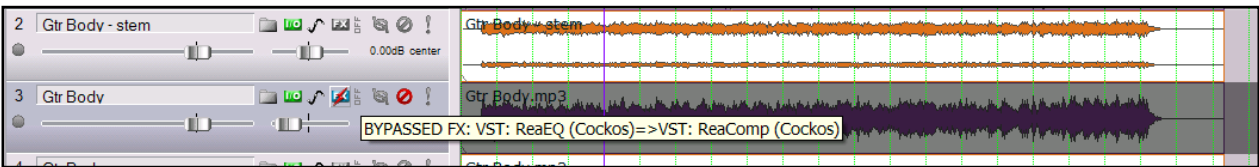
6.3 Stem Rendering

Stem Rendering is a technique that can be applied to ease your CPU load if it becomes (or is in danger of becoming) overloaded. The item is rendered to a new track, whilst the original track remains but is automatically muted and the FX bin is bypassed.

This offers you the convenience that if you later wish to change the FX in a stem rendered track, you can delete the rendered track, unmute the original, and unbypass its effects. This is how it works:

1. In the **Track Control Pane** area, right-click over the track number.
2. From the menu, choose **Render selected tracks to stem tracks (and mute/bypass originals)**

Stem rendering has a similar effect to a process known in some other DAW software as freezing tracks.



Note that the track that is produced by Stem Rendering will normally by default be a stereo track. If you prefer a mono track:

1. Right click over the rendered media item.
2. From the menu, choose **Item Settings, Item channel mode: Mono (Downmix)**.

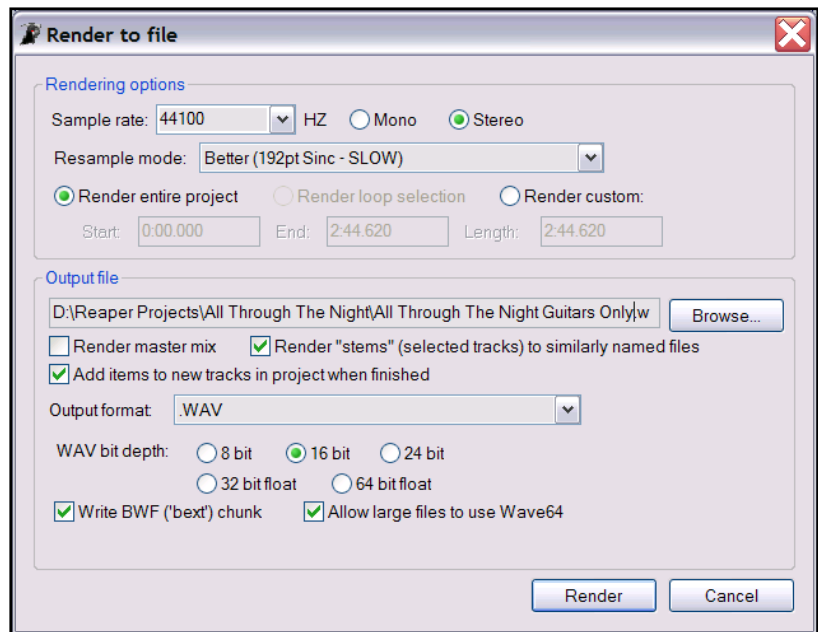
With Stem Rendering, all track settings (such as Volume and Pan) are written to the rendered track. If you only wish to freeze the track FX without doing this, you should consider using **Apply track FX to item as new take** instead. This is covered later in this section.

Tip: Hovering your mouse over any track's **FX** button causes a tooltip to be displayed, listing the plug-ins present in that track's FX bin. It displays this information even if the FX bin is set to bypass.

6.4 Stem Rendering a Group of Tracks

You can apply stem rendering to a group of tracks, so that they will be mixed down to a single stereo wave file as a rendered submix. To do this:

1. Place the required tracks into a folder.
2. In the Track Control Panel, select the folder.
3. Choose the **File, Render** command.
4. Make sure your selected options include **Stereo** and **Render "stems" (selected tracks) to similarly named files**. If you wish, also select the option to **add items to new tracks in project**.
5. Click on **Render**.



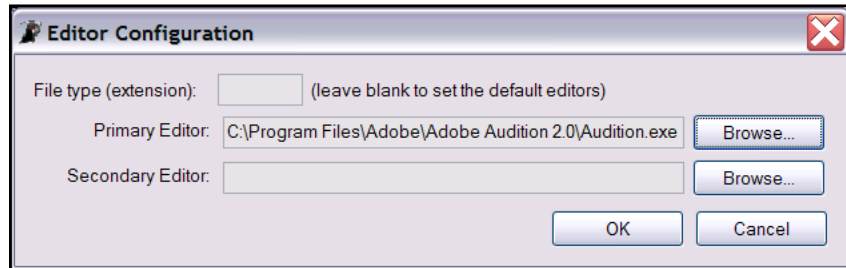
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6.5 Using an External Editor

We will shortly be showing you how to use REAPER's editing facilities to edit your media items. Before that, though, it's worth mentioning that if you have another program (such as Adobe Audition, Audacity or Sound Forge) which you wish to use in conjunction with REAPER for editing your items, you can do this quite easily.

To specify your external editors:

1. Choose the **Options, Preferences** command, then display the **External Editors** screen.
2. Click on the **Add** button
3. Use the **Browse** buttons (shown right) to identify and select your preferred wave editors.
4. Click on **OK**, then **OK** to close the Preferences window.

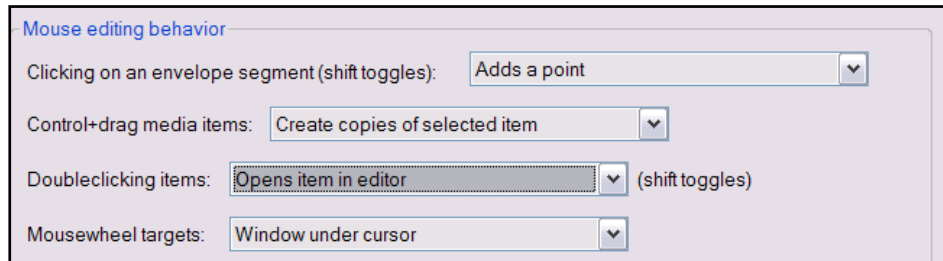


Notice that you can specify different editors for different file types, e.g. WAV, MP3, Midi.

To use your external wave editor:

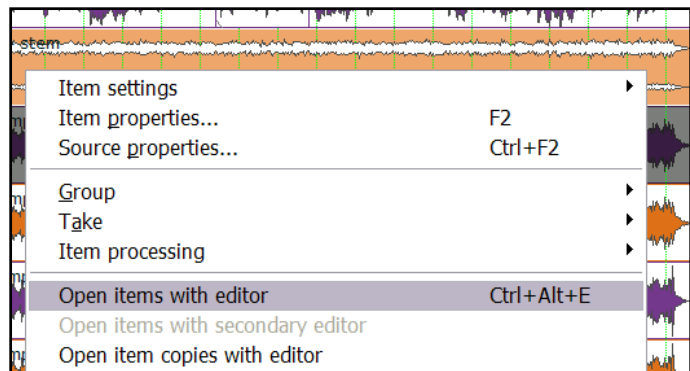
There are two ways you can access your preferred external editing program from within REAPER:

- Go to **Options, Preferences** and select the **Editing Behaviour, Mouse** screen. There you can set the double-click behaviour so that double clicking on an item will automatically open the editing program with that item.
- Within a REAPER project, right click over the media item that you wish to edit. From the menu, choose either **Open Items with Editor** or **Open item copies with Editor**.



Of course, your actual menu will show the name of your selected editing program rather than the word *Editor*.

Because your wave editing program is likely to use destructive editing (that is, it works directly on the actual file itself), the more prudent option is usually to take a copy of your item into that program.



6.6 Editing Items in REAPER

The topic of editing items in REAPER is a big one. REAPER features a comprehensive range of editing techniques, for managing the items within your projects.

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If you have worked with other audio software, you might find the way that REAPER works to be a little strange at first. The first question you might have when you look at the screen is, “Where are all the editing tools?” The answer is ... there aren’t any! At least, there aren’t many! But as you are about to see, that doesn’t mean that REAPER isn’t up to the job. You just get the wave editing features that you need, but without the screen clutter.

There are some basic concepts that you need to understand about REAPER’s design philosophy and structure before learning individual editing techniques. For example:

- Item Editing in REAPER is non-destructive. Edits made to Items are unique per Item and do not alter the content of the Source file. You can feel free to experiment knowing that your original recorded files are safe.
- Item Editing in REAPER basically consists of selecting an item, or a portion of an item (range), then doing something to it – such as splitting it, deleting it, copying it or moving it.
- Sometimes, three or four steps might be required to achieve an editing task. If there are tasks like this that you need to use frequently, you can assign a single Keyboard Shortcut to the entire sequence of tasks.
- To some extent, you can customise REAPER’s editing behaviour through the **Editing** settings within your **Options, Preferences** window. We will take a look at this screen and its various options later in this section.

There are just two more general issues that you need to be aware of before we move on to look at REAPER’s editing capabilities. They are:

1. How REAPER uses standard Windows editing techniques.
2. The REAPER Undo History window.

6.7 Standard Windows Features

Within REAPER, when you’re working on a project, most standard Windows techniques work pretty much as you’d expect them to – **Delete** key to delete any currently selected item (or items), **Ctrl** with left mouse click to build up a selection of items, **Ctrl C** to copy, and so on. Likewise, you can use drag and drop to move items, and hold down the **Ctrl** key while dragging and dropping to copy them.

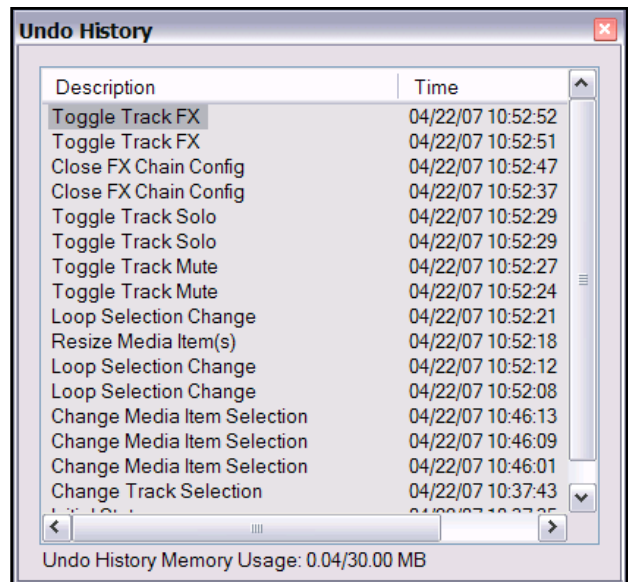
6.8 The Undo History Window

In addition, REAPER’s Undo feature is very user friendly and powerful. The **View, Undo History** command – or the keyboard shortcut **Ctrl Alt Z** – toggles open and closed the **Undo History Window** (see right). You can double click on any item displayed in that window to go back to that point.

The **General** settings page under **Options, Preferences** includes a section which you can use to determine the behaviour of the Undo History.

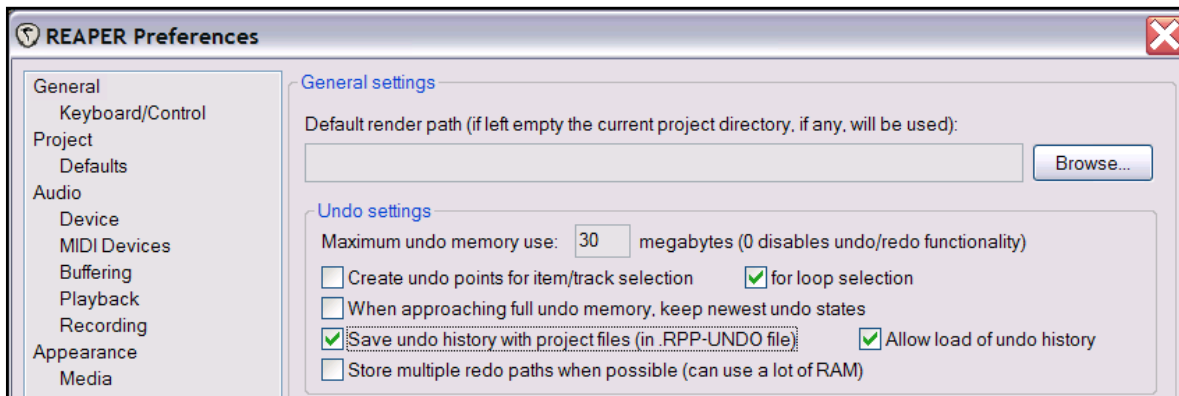
In particular, you can:

- Specify the maximum number of Megabytes of memory to be allocated to Undo. Setting this to zero will effectively disable this feature.
- Specify whether item selection and/or time selection are to be included in the Undo History.
- Ensure that if the allocated Undo storage area becomes full, the most recent actions will be retained in the Undo History.



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- Save your Undo History with the Project File. This means that even after retrieving the file at some later date, you will still be able to revert the project to an earlier state if you wish.



- Store multiple undo/redo paths.

Note also that the Undo History window is dockable.

6.9 REAPER Editing Fundamentals

Many of the basic editing tasks that you will be performing in REAPER involve the use of fairly intuitive standard Windows procedures for selecting and manipulating items.

Here is a summary.

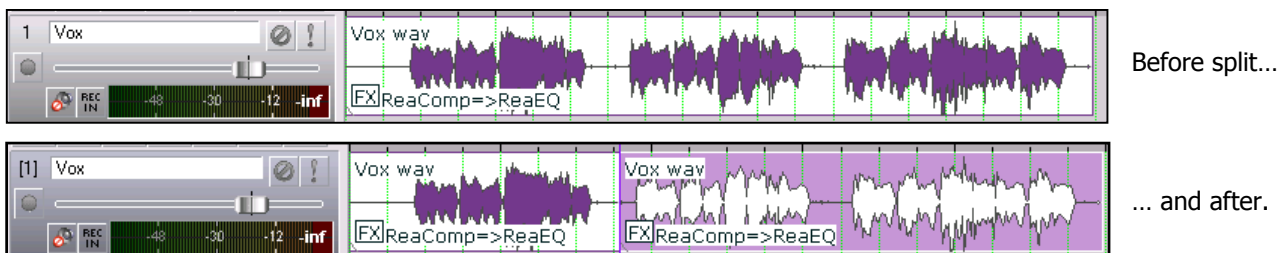
Select Items

- Select an Item by clicking on the Item. The colour of the Item will change to indicate it has been selected.
- Select multiple Items by using **Ctrl Click**.
- Select adjacent Items by using **Shift Click**.
- Select groups of Items by holding down **Alt**, then right-clicking and dragging a marquee around the Items.

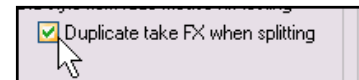
Split Items

- If no Item is selected, pressing S will split all Items on all Tracks at the Edit Cursor position.
- If Item(s) are selected, pressing S will split all selected Item(s) at the Edit Cursor position.
- If Item(s) are selected, pressing Shift S will split all selected Item(s) at the Time Selection.

Note: If an item containing an FX chain is split, then by default both of the resulting items will contain that FX chain. This is illustrated below.



You can turn this option off on the **Options, Preferences, Media** screen.



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Heal Split Items

To reconnect media item that have previously been split:

- Select the media items in the track.
- Right click over any media item within the selection and from the menu choose **Heal splits in selected items**.

Note: If a number of previously split items each containing an FX chain are healed, then only the FX Chain of the first of the items is retained. This is illustrated below.



Copy Items

There are several ways to copy Item/s in REAPER.

- Use Keyboard Shortcut **Ctrl C** to copy any selected Items.
- Right-click on an item and select **Copy selected items** from the menu.
- Select an item, then select **Edit, Copy** selected items.
- Hold down the **Ctrl** key while dragging the Item(s).

Paste Items

There are several ways to paste Item/s in REAPER.

- Use **Ctrl V** to paste an Item at the current cursor position. If a Track is selected, the Item will be pasted into the selected Track. If no Track is selected, the Item will be pasted into the last selected Track.
- Right-click on a Track and select **Paste** from the menu. If a Track is selected, the Item will be pasted into the selected Track. If no Track is selected, the Item will be pasted into the last selected Track.
- Select **Edit, Paste**. If a Track is selected, the Item will be pasted into the selected Track. If no Track is selected, the Item will be pasted into the last selected Track.

Cut Items

Cut removes the Item to the Clipboard. There are several ways to Cut Items.

- Use Keyboard Shortcut **Ctrl X** to cut selected Item/s.
- Right-click on a selected Item and select **Cut selected items** from the menu.
- Select **Edit, Cut selected items**.

Delete Items

Delete completely removes the Item from the project. There are several ways to Delete Items. Where an Item has several takes, all takes will be deleted, not just the active one.

- Use the **Delete** key to delete selected Item/s.
- Right-click on a selected Item and select **Remove selected items**. This will delete any selected Items
- Select **Edit, Remove selected items**.

Move Items: General

Items can be moved (that is, repositioned) using either of these methods:

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- Select the Item to be moved, then use the mouse to drag and drop, in the standard windows fashion.
- Select the item to be moved, then **Cut** the item. Position the edit cursor at the required place, select the required track and **Paste**.

Move Items: Special

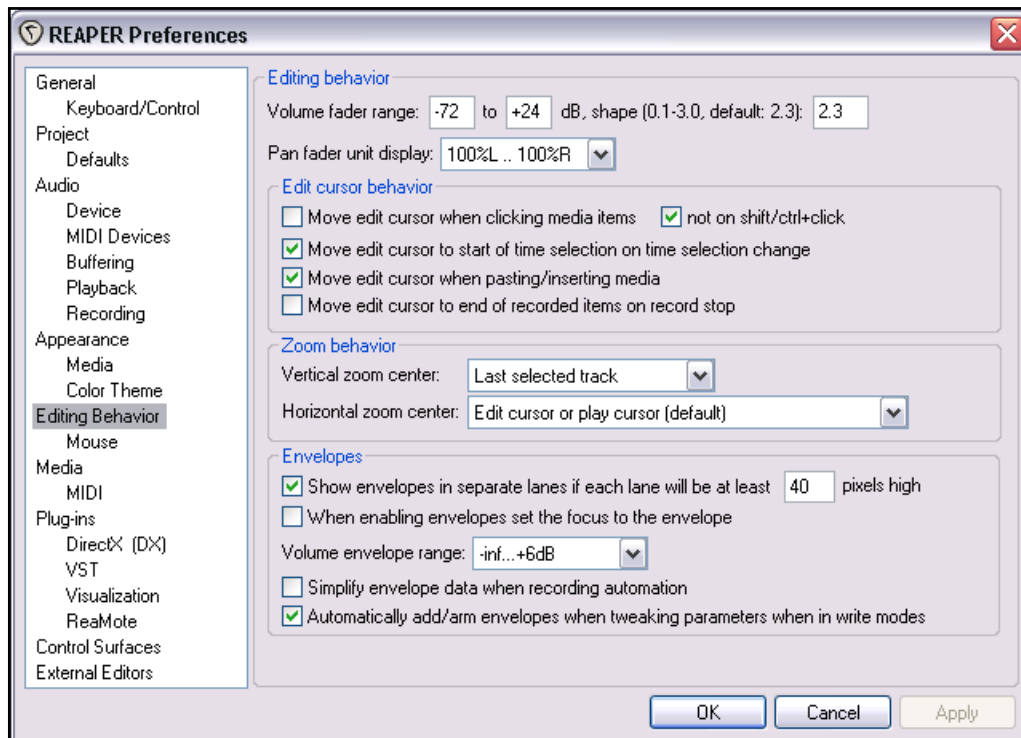
A number of keyboard shortcuts exist for moving items in ways that might be difficult to control with drag and drop, or cut and paste. For example:

Default Shortcut Key	Purpose
Num Pad 1	Slide item a little to the left
Num Pad 3	Slide item a little to the right
Num Pad 4	Move item a little to the left
Num Pad 6	Move item a little to the right
Num Pad 8	Move item up one track
Num Pad 2	Move item down one track

Note: This feature is often referred to as “nudge”. With REAPER, nudging is always relative to the screen display. For example, if you are zoomed in very closely on an item, then nudging left or right will move or slide it backward or forward through a much smaller unit of time than would be the case if the view was zoomed out to display the full project.

Tip: Double click on a track's index number in the Track Control Panel to select all the items in that track.

6.10 Editing Behaviour Preferences



You should be aware of at least some of REAPER's main editing behaviour preferences and how they work.

In particular, notice that you can specify whether or not the edit cursor is relocated when the time selection is changed.

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6.11 Manipulating Areas and Selections

Sometimes you may wish to perform an editing action on part of a media item – for example, to move or copy an area to somewhere else. In order to do this, you need to understand one important aspect of REAPER's design paradigm. Before performing any editing action on any part of an existing media item, you must first select the area on which you wish to work.

Note: If in the examples that follow, your selection snaps so as to select an area larger than that which you are trying to select, then *Snapping* is enabled. This will be explained shortly. In the meantime, you can press **Alt S** to toggle the snap feature off.

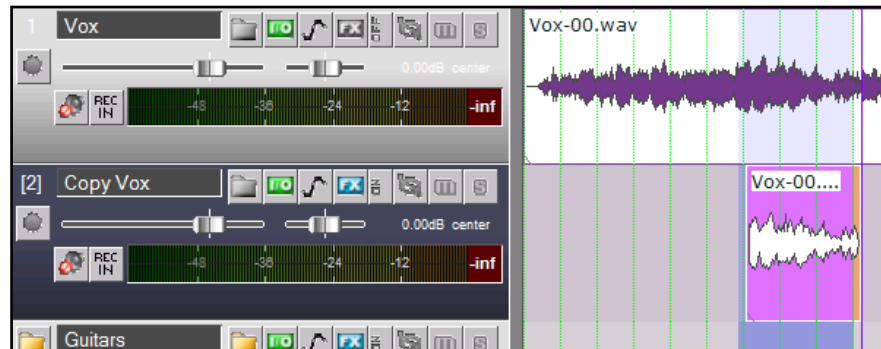
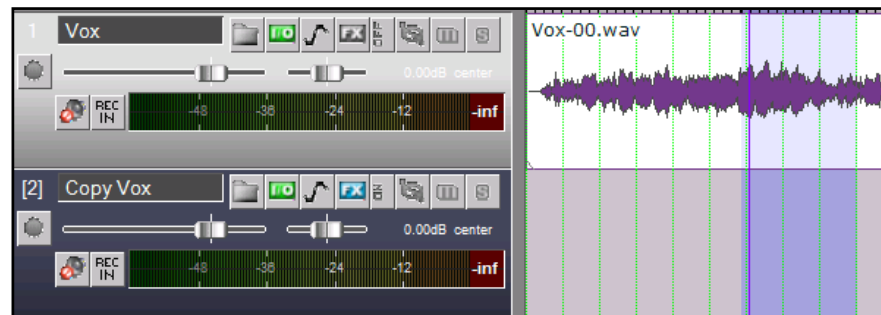
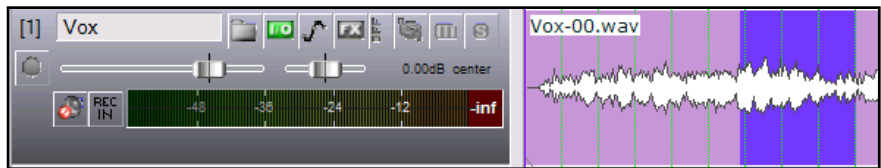
Example

In this example, let's assume that you want to select part of an existing waveform media item and copy it to another track.

1. Select the media item from which you wish to copy a selected area.
2. Hold down the **Ctrl** Key while you hover the mouse over the start of the area you wish to copy. Still holding the **Ctrl** key, **right click** and drag the mouse to mark the selected area, then release both the mouse and the Ctrl key. The area will now be marked (see above).
3. Right click over the area to display the context menu. Notice this includes a number of commands such as **Copy selected area of selected items**, **Copy loop of selected area of items**, **Cut selected area of selected items**, and **Split items at time selection**. In this case, you need to choose **Copy selected area of selected items**.
4. Select the track to which you want the item copied, and position the cursor at the required place (see right).
5. Press **Ctrl V** or choose **Edit, Paste** from the Main Menu.
6. The new media item will now be pasted at the cursor position (see right).

Tip: *Provided that you do not copy the selected area as a loop, it doesn't matter if you don't quite get your selection exactly right. For example, you can slip-edit to the left and from the left to include any material at the start of the*

item that you accidentally omitted, or slip edit from the right end to the left to remove any superfluous material that you may have accidentally included. We will cover slip-editing shortly.



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6.12 Snapping with Combined Snap/Grid Settings

You have already learnt how to define your grid settings. These determine whether or not a grid is displayed in your track area, and if so how that grid appears.

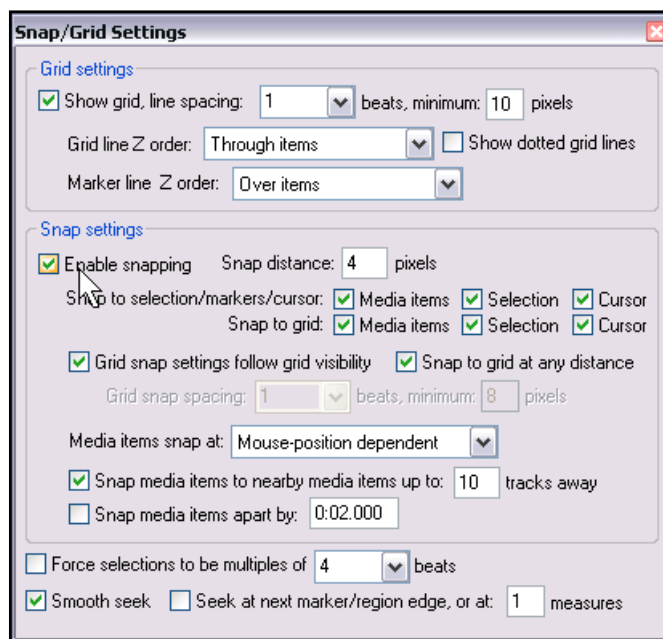
The **Snap/Grid Settings** window (shown right) can also be used if you wish to ensure that various actions and/or items are automatically snapped into position according to your settings. This, for example, might be to the nearest beat.

The Snap/Grid Settings dialog box is accessed by choosing the **Options, Snap/Grid Settings** command, or by the keyboard shortcut **Alt G**, or by right clicking on the Grid button on the REAPER toolbar.



The keyboard shortcut **Alt S** is used to toggle the Snap feature on and off.

You can decide whether you want snapping applied in all or any of the following ways:



Item	Explanation
Media Items	Causes media items when they are created or edited to be snapped according to your settings. You can specify that the snapping of media items should be only at their start, at both the start and the end, or determined by the mouse position at the time. <div></div>
Selection	You can determine whether your time and loop selections should be snapped according to your settings.
Cursor	You can determine whether your cursor should be snapped according to your settings.

Notice the **Snap Distance** settings. These enable your use of snapping to be more flexible. For example, you might set your grid spacing at, say 50 pixels, specify snap distance of, say, 5 pixels and turn off the option to **Snap to grid at any distance**. This will ensure that snapping to grid will occur only when you click the mouse within 5 pixels of one of the grid lines. Otherwise, the cursor will be positioned at the exact place where the mouse is clicked.

Tip: When snapping is enabled, this can be over ridden when selecting a loop along the timeline by holding down the **Ctrl** key while you make the selection.

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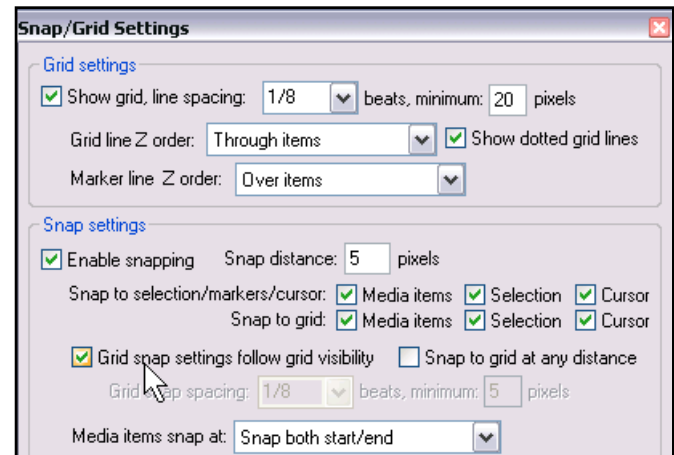
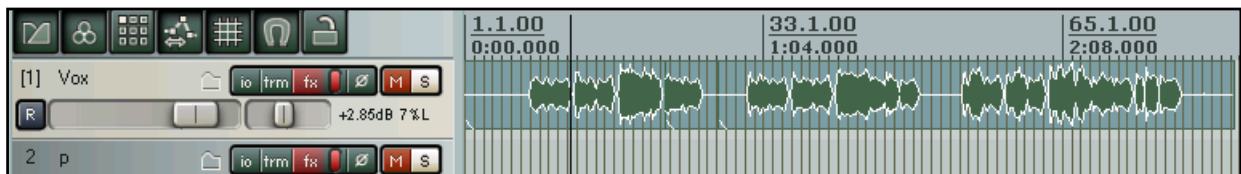
6.13 Snapping with Separate Snap and Grid Settings

In the examples discussed in the previous sections, REAPER was set up to use the same set of snap parameters for grid display as was used for snapping. In other words, the snapping would take place to the nearest grid position.

You might wish to change this, especially to reduce screen clutter. This might occur for example, if you wish to use very tight snapping settings, as shown on the right here.

Notice that in this instance, as before, the option **Grid settings follow grid visibility** has been enabled.

This produces the cluttered look shown below:

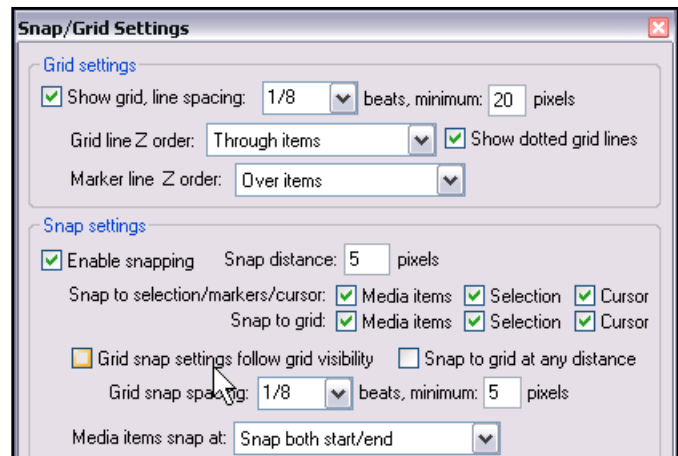
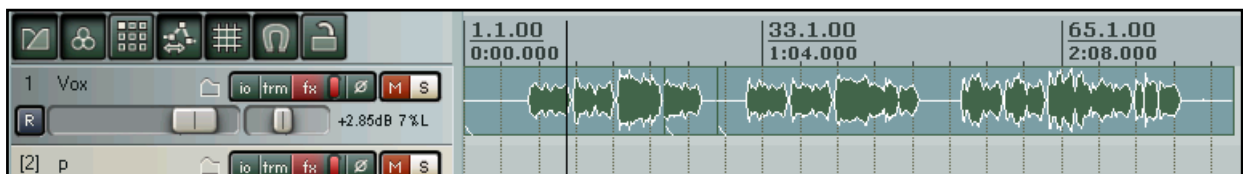


In this second example, we have disabled the option **Grid settings follow grid visibility**.

We have also changed the **minimum pixels** setting for **grid line spacing**, in this case to 20 pixels, whilst still specifying (just below the point where the cursor is shown on the screen shot) a **grid snap spacing** of one eighth beats,

This produces a less cluttered display on the screen, as can be seen in the example shown below.

The cursor position shown in this example is the exact spot that it has been snapped to – but this time the grid lines are not displayed at every single snap position.



You have just seen two examples. The effect of snapping is exactly the same in both cases, but the way it is displayed is varied. The best way to learn and understand how different permutations of these settings are applied and displayed is to experiment with them.

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6.14 Separating Loop Selection From Time Selection

By default, your time selection is linked to your loop selection. This means that when you select a time area other than that currently selected, the loop selection changes with it. However, you can change this behaviour by turning off the option **Loop points linked to time selection** (see illustration right).

When this option is disabled (i.e. not ticked), you can still use the **Alt** key while you click and drag along the timeline to change both the time selection and the loop selection together.

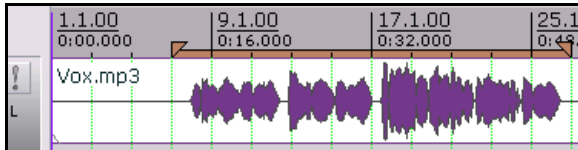
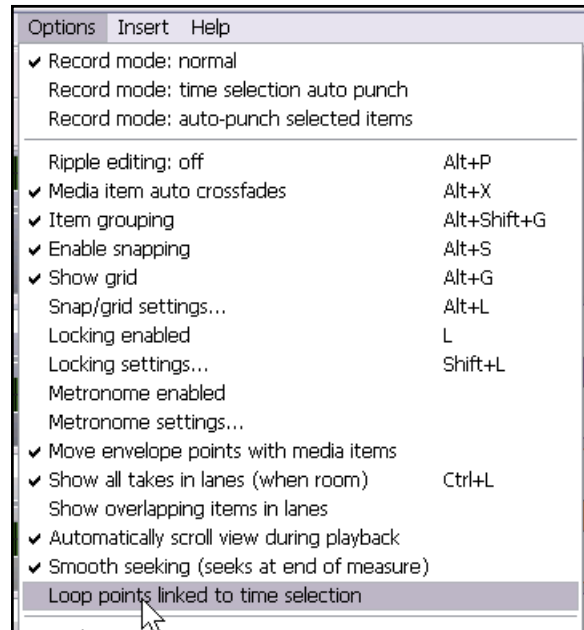
In addition, the following keyboard assignable actions are available:

Time selection: Copy time selection to loop points and

Time selection: Copy loop points to time selection

Example

Let's assume that you have used the **Options, Preferences, Keyboard Control** window to assign the **semi-colon** key to the action **Time selection: Copy loop points to time selection**. We will also assume that **Loop points linked to time selection** has been turned off.



In this first example, we have dragged along the timeline to create a loop.



Now we have dragged within the track area, just below the media item.

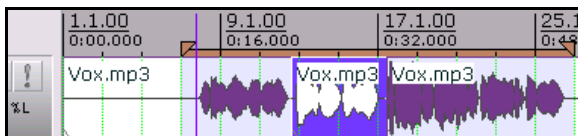
A new time selection is made within the loop area, but the original loop selection remains.



Next, we have right-clicked over the area and chosen **Split items at time selection** from the menu. We now have a separate item (for example, to be muted, or have any of its properties changed), but the original loop area is still selected.



Here we have made another new time selection, which we could also edit as required.



... then by pressing our keyboard shortcut (in this example, the semi-colon key) we ensure that the currently selected loop area now becomes also the new current time selection.

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6.15 Keyboard Shortcuts for Navigation

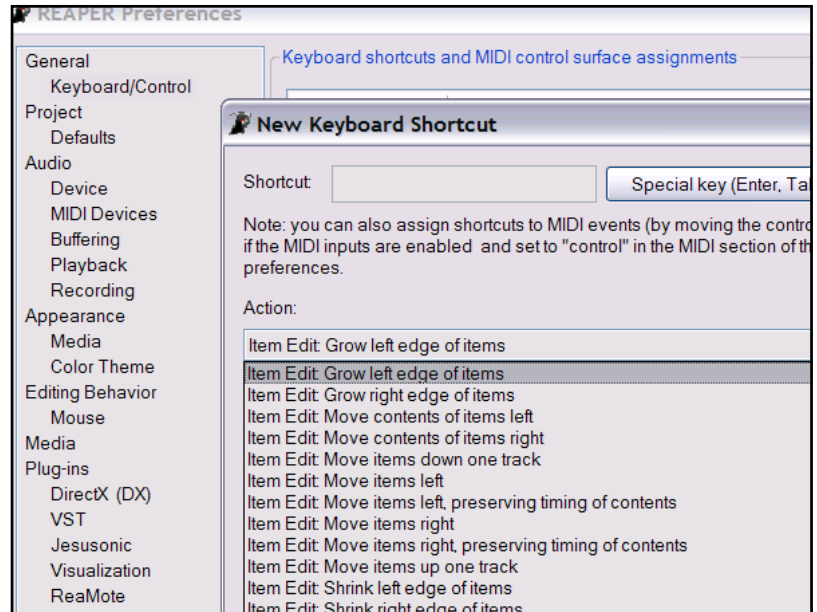
Many people like to use keyboard shortcuts, for example, for navigating between items, when editing and/or arranging your project. We've already introduced how you can create your own keyboard shortcuts.

There are a number of tasks to which you can assign your own keyboard shortcuts to make this easier. Choose the **Options** command from the main menu, then **Preferences**, then display the **Keyboard Control** screen. Use the method [explained on page 38](#) of this guide to add your own shortcuts.

A selection of some of the tasks that can be key-bound in this way is shown on the right.

These include:

- Select and move to item in next track.
- Select and move to item in previous track.
- Select and move to next item.
- Select and move to previous item.
- Move cursor to next transient in selected items.
- Move cursor to previous transient in selected items.



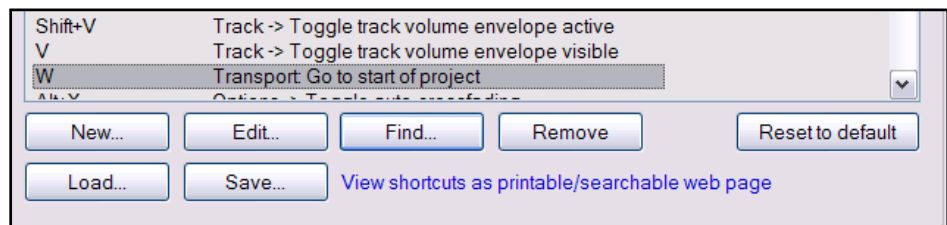
6.16 More About REAPER's Keyboard Editor

REAPER's keyboard editor incorporates a number of handy features that make it easier and more convenient to use. For example, you can quickly and easily:

- Check to see whether a particular keyboard shortcut has already been assigned to any command, and
- Check to see whether a command for which you would like to create a shortcut is available in the list.

Example

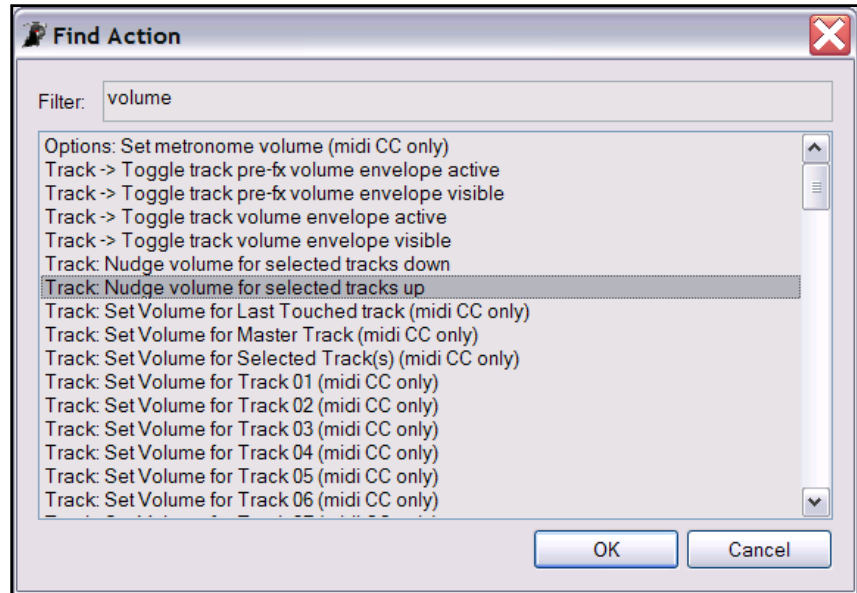
1. Choose the **Options, Preferences** command, and display the **Keyboard/Control** page.
2. Suppose that we are intending to create a shortcut to, say, nudge up the volume for the currently selected track. Perhaps we are thinking of using **w** for this.
3. Click on the **Find...** button. The Find Keyboard Shortcut prompt (shown above right) will be displayed.
4. Type **w**
5. You can now see that this is already assigned for **Transport Go to**



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start of project.

6. Click on **Find ...** again, and this time press **Shift W** – notice that this has not been assigned to anything and is therefore available.
7. Click on **New ...** to create a new shortcut.
8. When the **New Shortcut Window** is displayed, press **Shift W** then click on the first of the **Search ...** buttons.
9. This causes the **Find Action** dialog box to be displayed. We want to do something with *volume*, so in the **Filter** text box type **volume**
10. Now only those tasks concerned with **volume** are shown. Click on the item **Track Nudge volume for selected tracks up** (as shown, above right), then on **OK**.
11. Click on **OK** to close the New Shortcut Window, then **OK** again to close the Properties window.



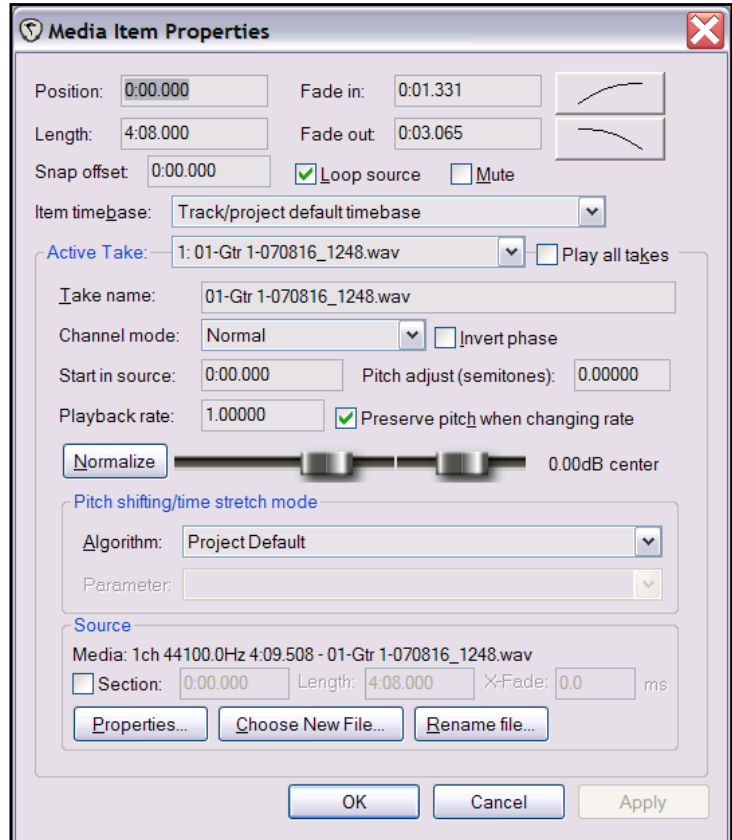
6.17 Media Item Properties

Before working through some examples of REAPER editing in action, we just need to know a little about Media Item Properties.

All items have a page of property settings which help determine the behaviour of that item. Often, editing in REAPER consists of selecting an existing item (or creating a new one) and then changing its properties.

You don't need to understand every single one of these properties before you get started, just to know where this information is accessed and changed. Some of the properties you can set within this dialog box include:

- Fade In and Fade Out
- Position and Length
- Mute
- Select active take and/or Play All Takes
- Channel Mode



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- Invert Phase
- Pitch Adjustment
- Adjust Volume and Pan, Normalize Volume
- Rename the source file, or replace the source file with a different one.

Some of these items – such as **Loop Source**, **Mute** and **Invert Phase** – are also available on the **Item Settings** menu (see below). In addition, for many of them Keyboard Shortcuts either already exist or can be defined.

6.18 Changing Item Channel Mode

Right clicking over any Media Item and choosing **Item Settings** from the context menu chooses a sub-menu of options to be displayed.

Notice in particular that for stereo media items, you have a number of simple **Item Channel Mode** options. These are:

Normal: maintains or returns the stereo item to its original channel state.

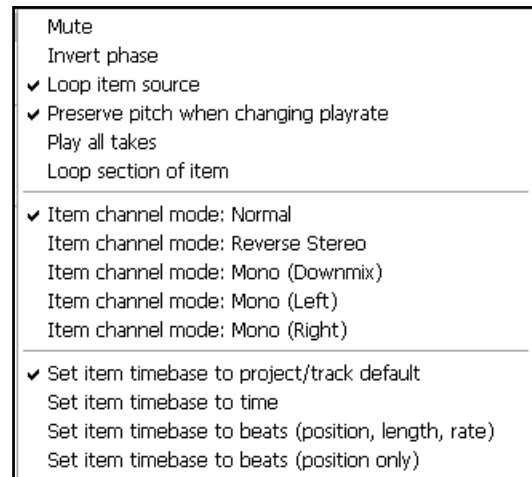
Reverse Stereo: swaps left and right channels.

Mono (Downmix): combines both left and right channels into a single mono channel.

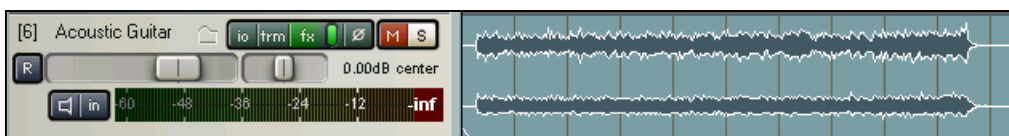
Mono (Left): produces a single mono channel using only the output from the original left channel only.

Mono (Right): produces a single mono channel using only the output from the original right channel only.

Some examples are illustrated below. Note that these changes are non-destructive. You can switch an item between these different states as often as you wish. For example, to convert a stereo media item to two mono items quickly and easily, you can simply duplicate, then set one to Mono (left) and the other to Mono (right)



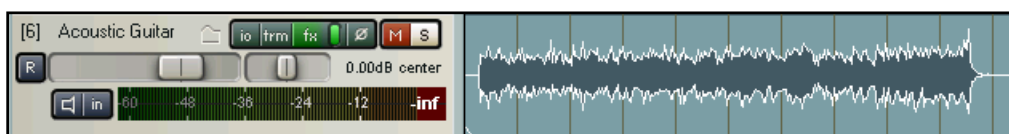
Mode: Normal



Mode: Reverse Stereo



Mode: Mono (Downmix)



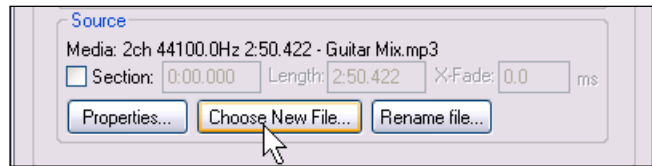
Mode: Mono (Right) – based on the original example

Channel Mode can also be changed from inside the Media Item Properties dialog box.

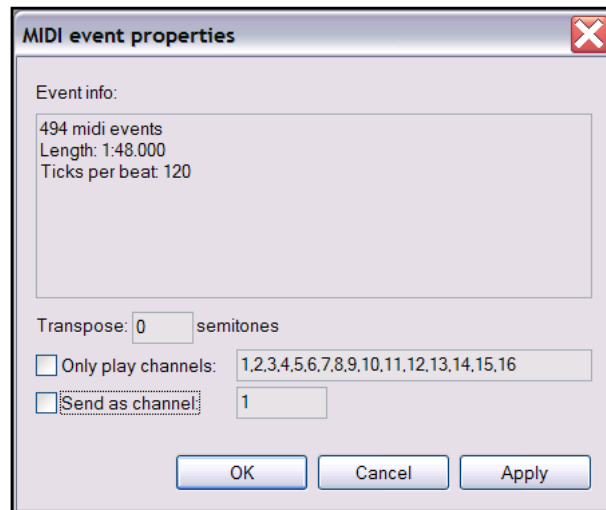
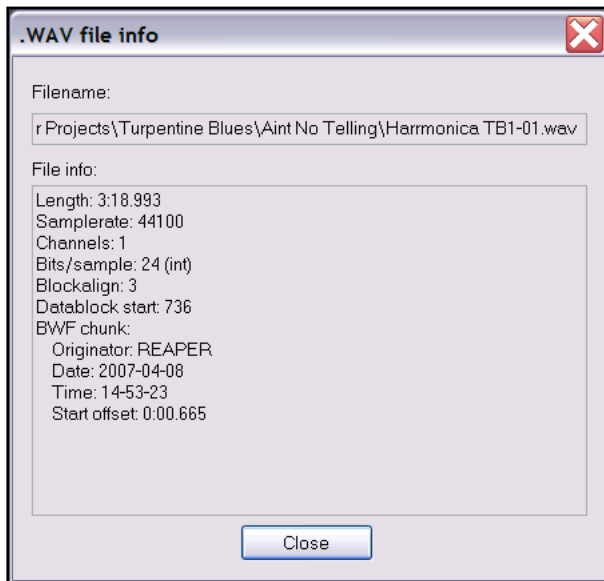
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6.19 Source Properties

You have just seen how you can use the **Media Item Properties** dialog box to determine how a media item behaves within your project. Within that dialog box, you also have the option to change the media item contents with **Choose New File**, or to rename the item using the **Rename File** option.



In addition, you can right click over any item in your Track View and choose **Source Properties** from the context menu. This displays information about the format of the original Audio file or MIDI recording which is the source of the item. In the case of MIDI items, you can also modify these properties. Examples are shown below:



6.20 REAPER Editing and Auditioning Example

Most new users of any digital audio software struggle with editing at first, especially if they are used to another program which uses different techniques. The best way to understand what's going on is to work through some examples. These examples assume that you have the option to *Link loop points to time selection* enabled.

Open the file **All Through the Night.RPP**. Use the **File, Save Project As** command to save it as **All Through the Night EDITS.RPP**.

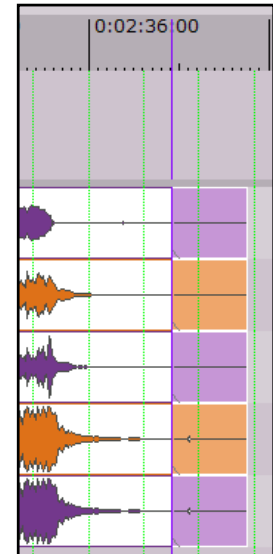
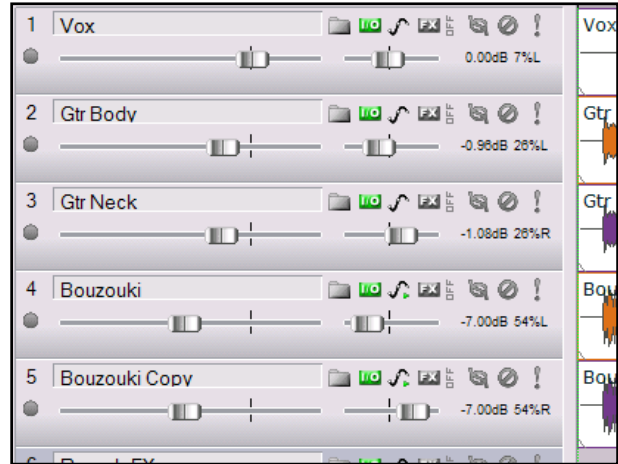
The examples that follow are designed to help you to learn and understand the use of REAPER. They are not intended to cover every possible feature – you can explore these for yourself – nor is it suggested that they represent a particularly good arrangement of this song.

1. We are going to make a copy of the Bouzouki track and then play around with the sound. In the Track Control Panel, right click over the Track number for this track, then from the menu choose **Duplicate Selected Track**.
2. Change the name of this new track to **Bouzouki Copy**. Press **Ctrl S** to resave the Project File. You should do this regularly without needing to be reminded!
3. In the Track Control Panel, click on the track number for the first Bouzouki Track then hold the **Ctrl** key and click on the track number for the second track. Both tracks are now selected.
4. Click on the **Solo** button for either track – both will be soloed.



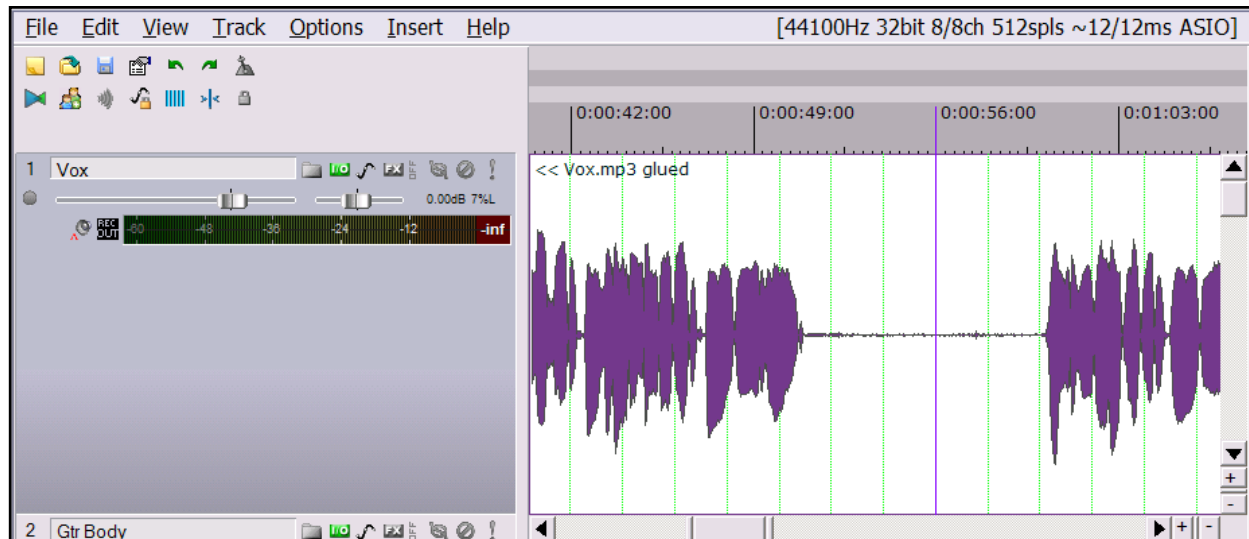
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5. Use the mouse to lower the volume fader on either track to around -7dB – both tracks will be lowered. As you get near to the -7dB mark, hold the **Ctrl** key down for more precise movement.
6. Holding down the **Shift** key, move the Pan fader for the first Bouzouki Track to around 55% left, and, still holding the **Shift** key, move the Pan fader for the second Bouzouki track to around 55% right.
7. Right click over the Media item for the second Bouzouki Track. Choose **Item Properties** from the menu. Change the **Position** to **0:00.007**. Click on Apply then OK. This causes this track to be nudged 7 milliseconds to the right, thus adding a very small delay effect that makes the instrument sound more full bodied.
8. Press **Ctrl S**. Play the Song.
9. While it plays, hold down **Ctrl** and click on the **Solo** button for either of the Bouzouki tracks. This clears both the Solos.
10. Right click just beneath the **Track Control Panel** area and choose **Show Master in Track View**.
11. Adjust panning and volume for the various tracks to get a reasonable mix. You might choose to end up with something similar to that shown on the right. Press **Ctrl S**.
12. In the example shown, you might be happy with the overall balance between the different tracks, yet the overall volume of the Master might be just a tad too loud in parts.
13. Open the **FX** bin for the Master and insert into it the JS/Utility Limiter. Set the maximum volume in the Limiter to -0.5 dialog box, close the FX window, and make sure the Volume Fader for the Master is set to 0dB . You should now be able to play the song without clipping.
14. Notice there is an extended period at the end of the song that we might wish to remove. Position the Edit Cursor at around the position shown (right). Make sure that no track is selected, then press the letter **S** to split all tracks at the cursor mark.
15. Note that whereas before each track consisted of one item, each now has two items. The items (to the right) that you have just created by splitting should still be selected.
16. Press **Delete** to remove these items. Press **Ctrl S** to save. You should have got this message by now – we'll stop reminding you.
17. Now we're going to do something really clever – we're going to mute *part* of an item. To do this, we'll first need to make a separate item containing just the area you want muted.
18. Select the media item (peak) for the **Vox** track. Position the Edit Cursor round about the 56 second mark.
19. Press the **~** key (**Shift `**) to maximise the current track. Press **Ctrl Alt Up** or **Ctrl Alt Down** until the **Vox** track is displayed. At this level of magnification you can see that some unwanted sounds have been recorded during a passage when the singer is not singing. As likely as not, this is probably headphone bleed. We're going to get rid of it.
20. If you want to hear it first, you can of course **Solo** that track and play it. Don't forget to Unsolo when finished.

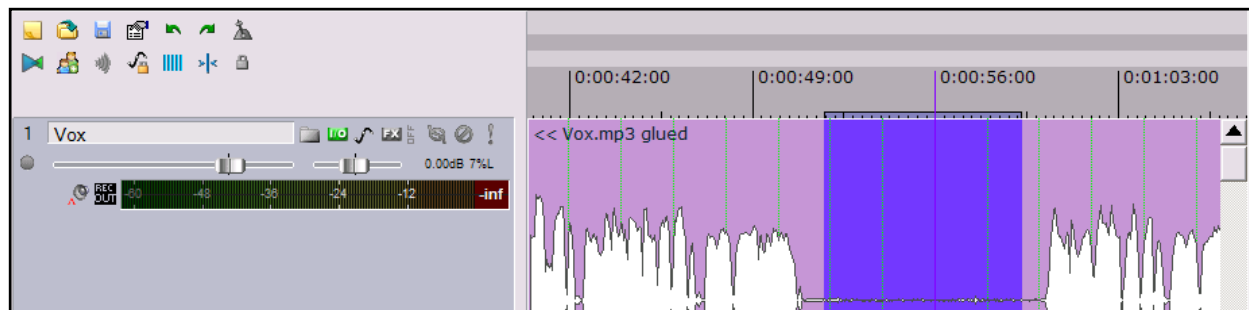


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21. With the edit cursor at or near the 56 second mark, repeatedly press the **+** key, until the area we want to deal with occupies most of the screen.



22. Click once on the media item to select it.
23. Click and drag along the timeline to select the region that we wish to work with (see below).



24. Right click over the timeline and choose the command **Split Items at Time Selection**. This creates a new item, and this new item is still selected.
25. Right click over this new item, then from the menu, choose **Item Settings**, then **Mute**.
26. Press the **~** key again to return the whole of your song to the display.
27. Play the song. Notice that the **Vox** track is now muted during the passage that we have been working on.
28. Press **Ctrl S** to save. We'll be returning to this example shortly.

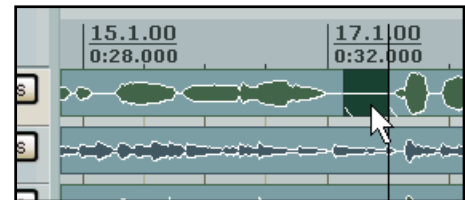
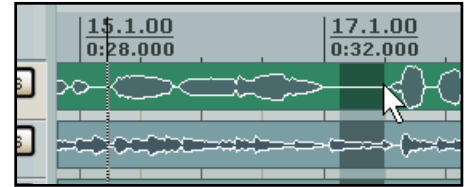
Tip: When you are playing back a song, in the course of editing you may from time to time wish to reset your VU Peaks without needing to stop and restart playback. This is another example of an action that can be assigned a keyboard shortcut from the **Options, Preferences, Keyboard/Control** screen. Look for the action **View: Clear all peak indicators** and assign a shortcut of your choice to this action.

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6.21 Editing Media Items during Playback

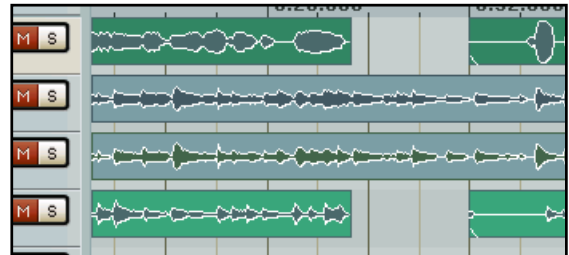
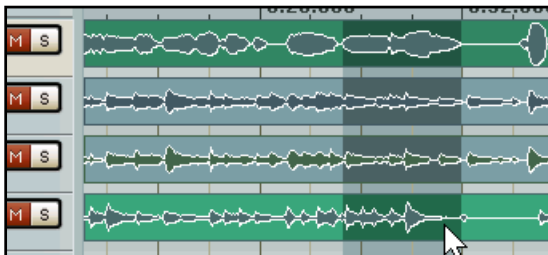
At times you may wish to edit a media item while the project is playing and without stopping playback. For example, you might wish to select and mute part of a media item. You can do this using the following method, which is the same whether or not you have the option **Loop points linked to time selection** enabled:

1. Play the project.
2. Select the area of the item that you wish to work with (for example, to mute, delete or copy) by holding down the **Alt** key and **clicking and dragging with the right mouse button** along the required portion of the track. The result of this is shown on the right.
3. Right click over the selected area and make your choice from the menu. For example:
 - To remove the selected area, choose **Cut selected area**.
 - To mute the selected area, first choose **Split items at time selection**, then again right click and choose first **Item settings** then **Mute**. The effect of this is shown on the second screen shot (above right).



Notes:

1. You can do this with more than one adjacent track at a time by simply extending the mouse over both tracks when you are making your selection.
2. You can even do this for media items in non-adjacent tracks. Select the first area as explained above, then hold both **Alt** and **Shift** while you click on any subsequent tracks. In the first of the two screen shots below, tracks 1 and 3 have had an area selected in this way. In the second screen shot, the same selected area has been cut from both media items.



Managing the Play Cursor

By default, when a project is playing, pressing **Stop** (or **Spacebar**) will stop playback and return the play cursor to its previous starting position. Pressing **Pause** (or **Enter**) will pause playback at the current play cursor position. There is, however, a third option. You can click on the Time Ruler, an empty area of any track or anywhere in the empty area below the last track.

Each of these will have one of two effects, depending on your **Options, Preferences, Audio, Playback** settings. Notice the options under **Seek playback when clicked**.

Seek playback when clicked:		
<input type="checkbox"/> Top ruler	<input type="checkbox"/> Empty areas of tracks	<input checked="" type="checkbox"/> Empty area below tracks

For any of these options that are ticked (in the above example, **Empty area below tracks**), clicking at any point will cause the playback to be immediately moved to that point.

For any of these options that are not ticked, the play cursor will be moved to that point the next time playback is stopped.

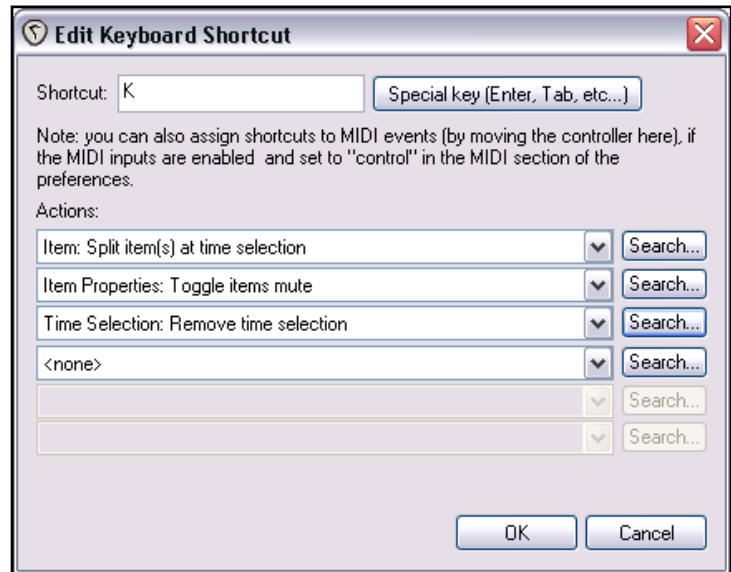
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6.22 Assigning a Shortcut to an Editing Sequence

In the above example, we introduced a procedure for muting part of a track. It is sometimes better to do this rather than simply deleting the passage in case for any reason we later decide that we wish to use that passage after all.

However, you might think that the steps it requires are a little tedious. If so, you can create a single keyboard shortcut for the whole sequence. In fact, one keyboard shortcut can be defined to perform a sequence of up to six tasks. This is how:

1. Choose the **Options, Preferences** command and display the **Keyboard/Control** screen.
2. Click on **New** and type a letter to be used as your shortcut – say, **K**
3. Display the **Action** list, then select **Item: Split item(s) at time selection**
4. Display the **Additional Action** list and select **Item Properties: Toggle items mute**
5. Display the next **Additional Action** list and select **Time Selection: Remove time selection**
6. Click on **OK**.
7. Click on **OK** to close the Preferences window.



Applying the Shortcut: Example

1. Select one of the Vox items which has an area that you wish to mute. Make sure that this is the only item selected.
2. Click and drag your mouse along the timeline to define the region that you want muted on the **Vox** track.
3. Press **K**. That's it! Except
4. Don't forget **Ctrl S** to save the file.

Tip: You can use this same method to assign a different shortcut key to another commonly needed task, that is:

1. Split items at Time Selection
2. Item: Remove Selected Items

Tip: After creating your own keyboard shortcuts, use the **Save** button in the Preferences, Keyboard Control window to save your complete set of keyboard assignments to a file. This will make it easier for you to recover your settings if any problems arise in the future.

Note: Later in this section you will learn more about the use of keyboard shortcuts, including using keyboard shortcuts to create interactive macros.

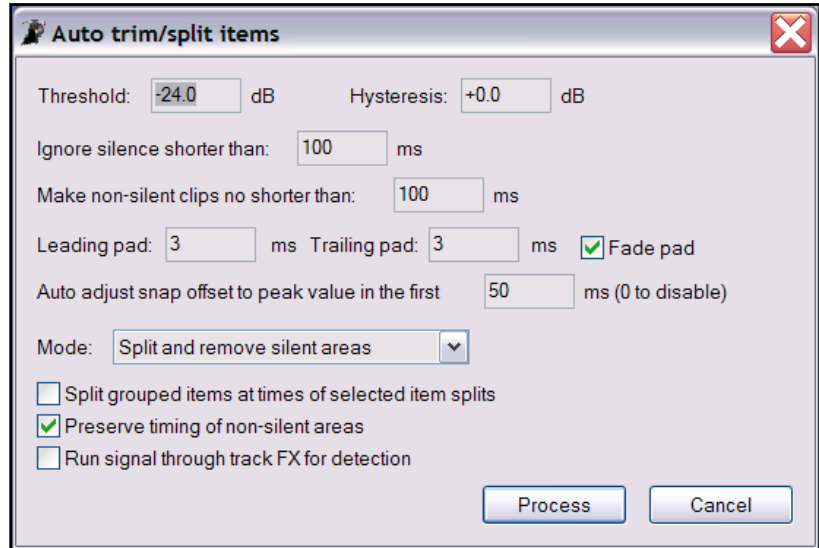
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6.23 Automatic Splitting and Trimming

You might wish to split items in order to mute or delete silent (or almost silent) passages within a take. Take, for example, a vocal track. There may be long instrumental passages when you know that any sounds recorded on the vocal track should be removed – such sounds will most likely consist of the vocalist coughing or shuffling.

You could go through your tracks removing each such passage one at a time – or you can get REAPER to do this for you, using the **Auto Trim/Split** command. To do this:

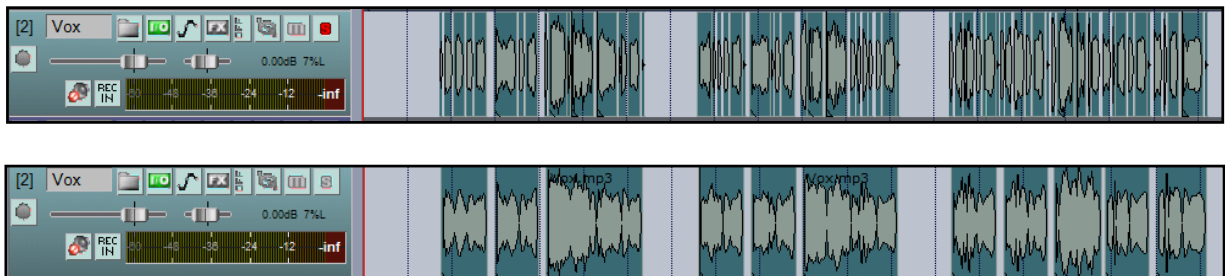
1. Select the required media item or items.
2. Right click over any selected item, then choose **Item Processing** then **Auto trim/split selected items**.
3. Specify your required settings then click on **Process**.



It's important that you understand something about these settings. The most important include:

Item	Description
Threshold dialog box	Passages whose volume falls below this threshold will be removed. If set too high, you might split and remove elements of the recording such as natural decay.
Ignore silence shorter than	Determines the minimum length of silence for passages to be removed. If set too low, this can create a "staccato" effect.
Preserve timing of non silent areas	Leave this ticked for normal editing, turn this off for Ripple Editing.

The following examples show this process applied to identical media items but with different settings. In the first case, Threshold was set at -24.0 dB and minimum length as 100 ms. In the second, these were set at -20 dB and 500 ms respectively.



Note: As an alternative to splitting and trimming items, if you prefer you can use a Noise Gate such as **ReaGate** to achieve a similar effect. [This is discussed in Section 16.](#)

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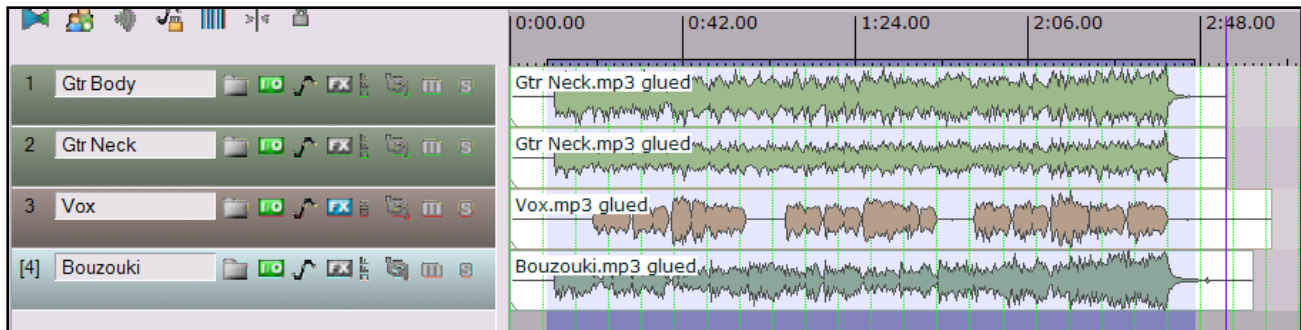
6.24 Crop Project to Selection

In the course of recording your tracks, it's not unusual to end up with a period of silence at the beginning, before your song actually starts, and varying periods of silence at the end of your various tracks, where you have perhaps allowed the recording to continue longer than is necessary, to make sure that you don't lose the decay of a particular instrument.

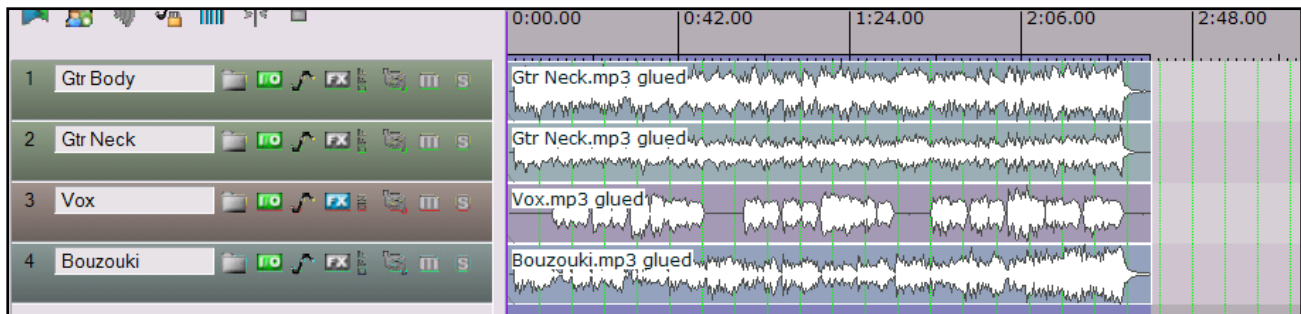
Of course, you can fix this by slip-editing your tracks individually, then dragging and dropping them to the start of your timeline. A quicker way would be to **Crop project to selection**.

To crop a project to selection, do this:

1. Click and drag along the timeline to mark the area that you want to keep – see picture below.



2. Right click over the Timeline and choose **Crop project to selection** from the menu.



3. Save the file.

Tip: If immediately after cropping to selection you again right click over the Timeline and choose **Zoom selection** from the context menu, your project will expand horizontally to fit the width of your Track View window.

Of course, if you wish, you can combine these two commands by assigning them to a single shortcut within the **Options. Preferences, Keyboard Control** window.

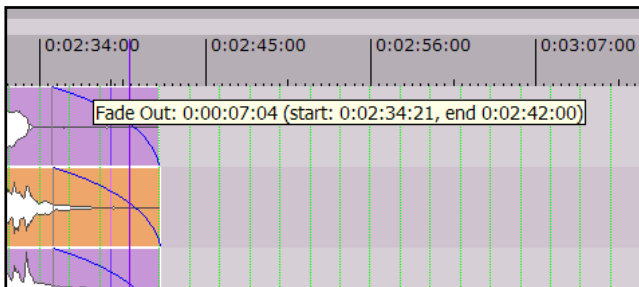
Remove selection	ESC
Zoom selection	Ctrl+Num +
Set selection to selected items	
Insert time signature marker...	Shift+C
Insert marker...	Shift+M
Add region from selection	Shift+R
Crop project to selection	
Insert empty space in selection	
Remove contents of selection (moving later items)	
Paste	Ctrl+V
Split items at cursor	S
Split items at loop selection	Shift+S
Select All	Ctrl+Alt+A

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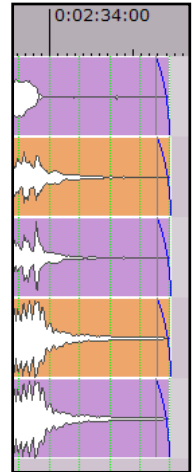
6.25 Adjusting Fades

If you select the rightmost clip in each track and zoom in, you will see that there is a fadeout curve at the end of each item. You can change both the shape and duration of this curve, either using the mouse, or through the **Item Properties** dialog box.

1. Select the rightmost item on each track.
2. Hover your mouse over the border between the end of any track and the background area, near the top of the media item. The mouse changes to display a curved shape.
3. Click and hold down the mouse button. Drag to the left to increase the length of the fadeout (see picture below) then release the mouse.



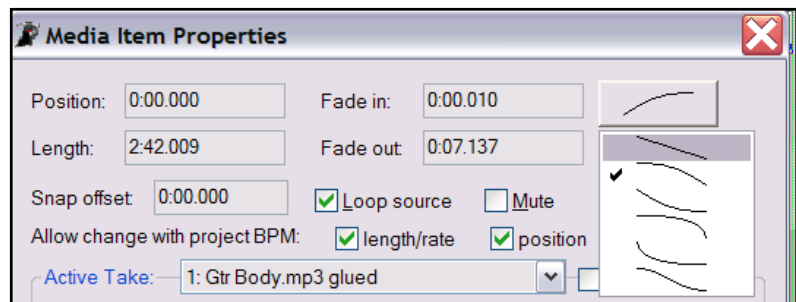
4. Notice that the fadeout curve is now more gradual. But we want it to start sooner.
5. Make sure that these five media items are still selected.
6. Place the mouse over the border between the end of any item in the selection and the



background area. Notice it changes to a horizontal double-headed arrow.

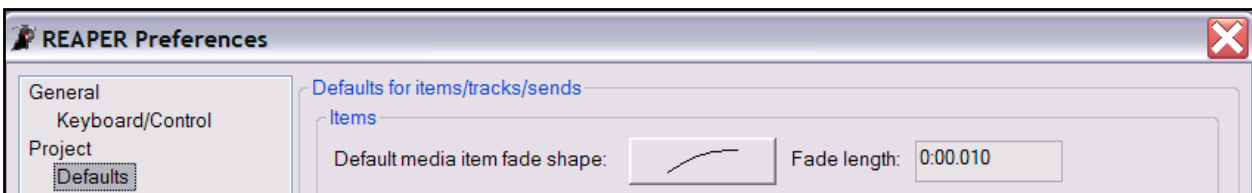
7. Click, hold and drag the mouse a little to the left. Notice that because the tracks now become a little shorter the fadeout, though still the same length, will begin sooner.

8. Now select any one of these items, right click over it and select **Item Properties**. Notice that the new length of the fadeout has been recorded here. If you wish, you can also adjust the length of a fadeout by changing the value in the dialog box.



9. Notice (right) also that, still in the **Item Properties** dialog box, you can change the shape of the fade curve if you wish. This can also be changed in Track View by hovering the mouse over the fade for any track (or selection of tracks) until the mouse displays a fade curve. Right-click for a menu of different curve shapes.

Notice that your **Preferences** dialog box includes an area on the **Project Defaults** screen where you can specify default fade and crossfade behaviour.



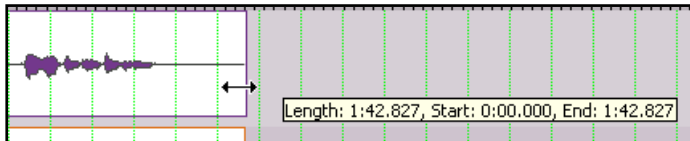
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6.26 Slip Editing

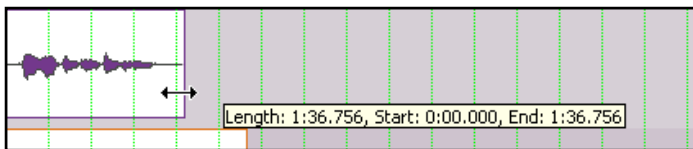
You can slip-edit unwanted passages from the start or end of a media item by following this sequence:

- Hover your mouse over an item's left or right edge so that the mouse appears as a double headed horizontal arrow,
- Click and drag to the left or right (as appropriate), then release the mouse.

Illustrated is an example of slip-editing, before and after:



An example of a single media item before slip-editing.



An example of the same media item after slip-editing.

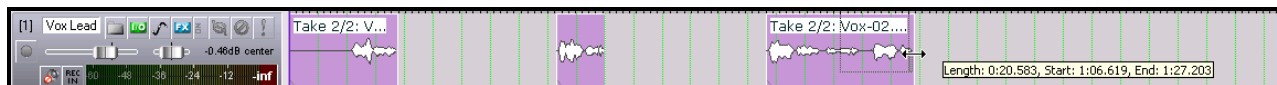
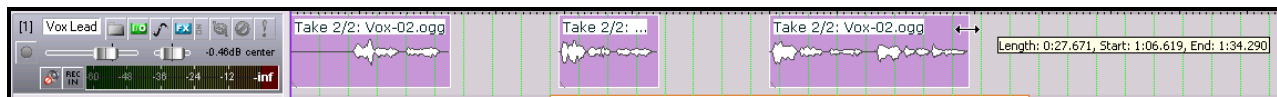
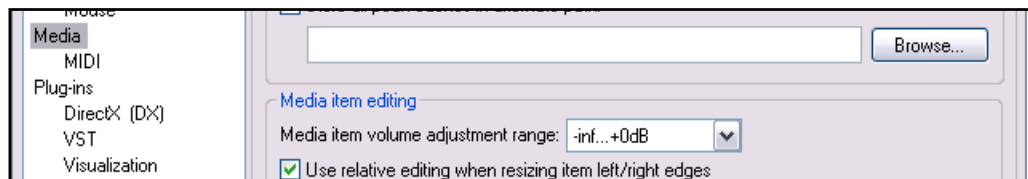
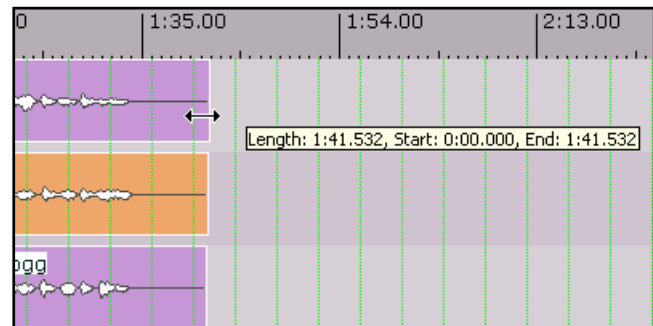
Slip Editing Multiple Items

To slip edit several items in different tracks, simply select all the media items required (hold the **Ctrl** key while clicking on each item required), then slip edit any item in the selection.

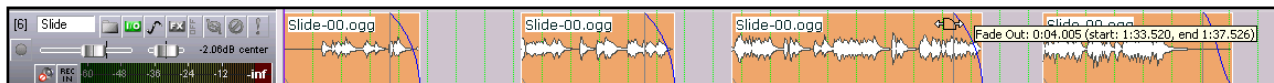
The example on the right shows three items in three separate tracks being slip edited together.

To slip edit several media items in the same track, you must first ensure that the option to **Use relative referencing when resizing left/right edges** is enabled. This option can be found under **Options, Preferences, Media**.

You can then select several items in the same track and slip edit them together. An example of this (before and after) is shown below:



When **Use relative referencing** is enabled, you can also apply fades to multiple media items by holding **Ctrl Alt** when applying the fade:



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6.27 Managing Item Fades and Trims

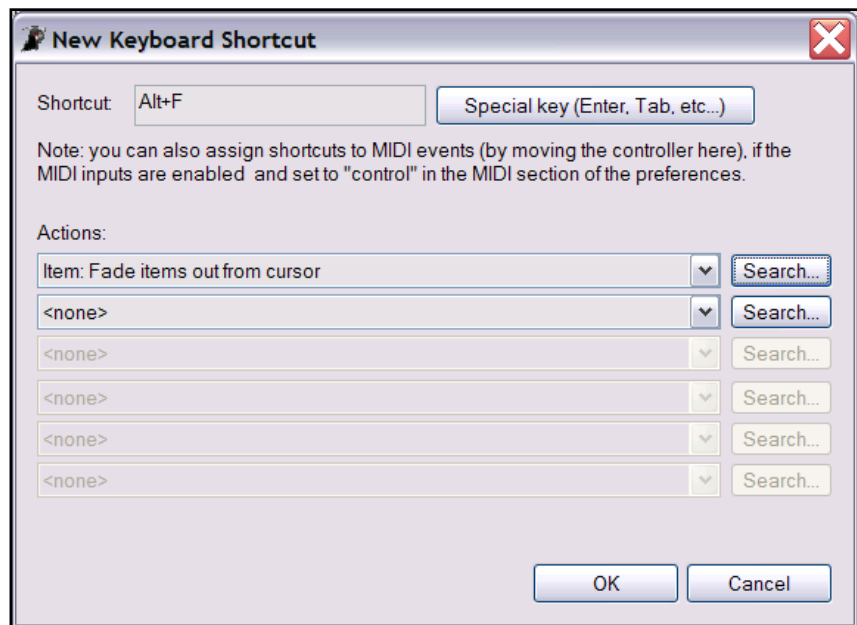
You have already been introduced to some examples of how keyboard shortcuts can be used to make REAPER even quicker and easier to use. Trimming and fading tracks are two more examples where you might wish to do this.

In this example, we will create the following shortcuts:

Alt A	Fade track out from cursor position
Alt T	Trim track at cursor position

Example

1. Press **Ctrl P** (Options, Preferences command).
2. Press **K** (to select the Keyboard/Control page).
3. Click on **New** to display the **New Keyboard Shortcut** window.
4. Press **Alt A** to specify your shortcut keys.
5. Click on **Search** and select **Item: Fade items out from cursor** from the list.
6. Click on **OK** then **OK** again.
7. Now use this same method to assign the keystrokes **Alt T** to the action **Item: Trim items right of cursor**.
8. Close the **Preferences** window when finished.



Very often when you record, you'll find you have an unwanted silent passage at the end. After assigning the keystrokes as explained above, you can select your tracks, click on the timeline at the required spot and press **Alt T** to trim off the silence, then reposition the cursor and press **Alt F** to create fadeouts.

Of course, you can still trim media items manually if you prefer. Position the cursor over the end of the media item so that the mouse changes to a double-headed arrow, then click and drag to the left.

Trim to Selected Area

If you want to trim a media item or track from both the start and the finish at the same time you can do so. Just follow this sequence:

1. Select the media item (or items).
2. Click and drag along the timeline to select the area that you want to keep.
3. Right click over a selected media item and choose **Trim items to selected area**.

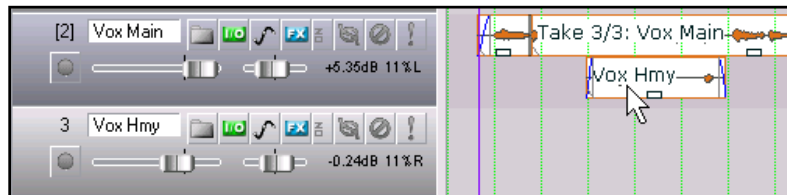
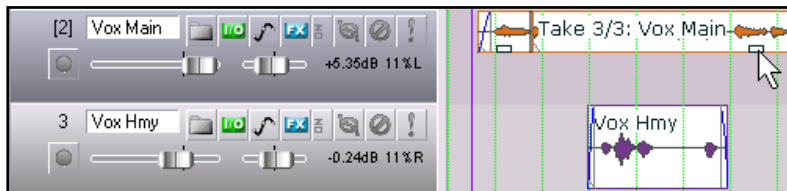
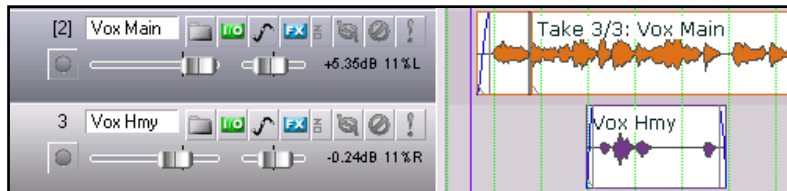
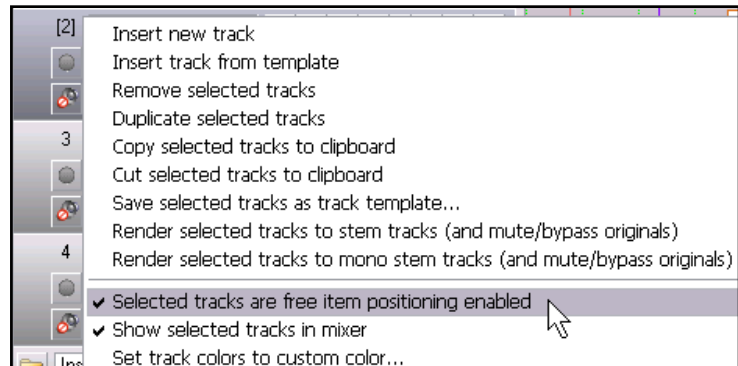
Tip: If your **Snap/Grid Settings** are set include **Media Items**, then provided that snapping is enabled, snapping will be applied when you slip edit or trim Media Items.

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6.28 Free Item Positioning

By choosing the option for **free item positioning** you are able to move your media items around freely within a track or tracks. This can be helpful, for example if you want two or more media items to play simultaneously or to overlap on the same track. To turn this feature on:

- Select the track (or tracks) for which you wish to allow free item positioning.
- Right click over the Track Control Panel and choose **Selected tracks are free item positioning enabled** from the context menu.



The following series of illustrations demonstrates an example of how this feature might be used.

In the first screen shot (left) we have a Main Vocal and a Harmony Vocal on different tracks. We might find it convenient to place these together on the same track.

In this second screen shot, we have enabled free item positioning for the Vox Main track.

Notice that there is a small handle (shown by the mouse cursor) which can be used to adjust the height of this media item.

In this third screen shot (below), the media item for the Vox Hmy track has been dragged and dropped into the Vox Main track.

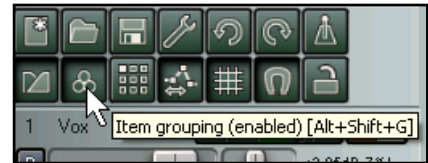
When this track is played, both these media items will play together. In fact, in this example, Track 3 can now be deleted.

Notice that even after free item positioning has been enabled, you can still use the **Media Item Properties** dialog box (**F2**) to adjust such aspects as volume and panning for individual media items.

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6.29 Grouping Items

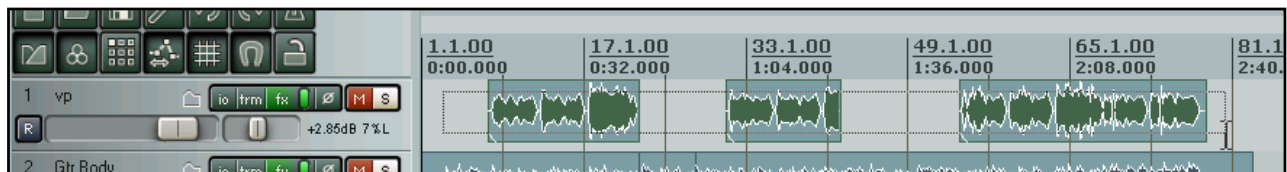
Provided that Grouping is enabled – **Options, Item Grouping** command, or **Alt Shift G** – items can be grouped together to facilitate working with them. Select the items and use **G** to add them to a group. If you prefer, you can use the **Item grouping** button on the REAPER toolbar to toggle grouping on and off.



U removes a selected item from a group, and **Ctrl G** can be used to select all grouped items.

Further items can be added to a group using the **Ctrl** key while you click on those items.

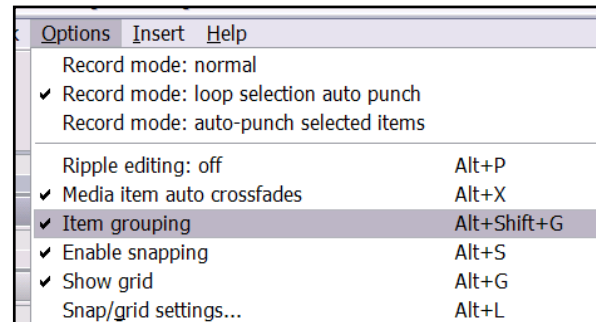
Provided the items are adjacent, you can also define them as a group by clicking and holding down your **right mouse button** then **dragging the mouse** to “capture” these items (as shown below), then releasing the mouse.



Example

Here is a simple example, using the file **All Through the Night EDITS.RPP**

1. We'll start by tidying up this file a little. Select the first of the muted items on the **Vox** track, then hold the **Ctrl** key while you select the second muted item. Press **Delete** to remove these. This track should now comprise three items.
2. Check your **Options** menu to ensure that **Grouping** is enabled. If it isn't, turn it on. Notice that by default, the keyboard shortcut **Alt Shift G** can be used to toggle Item Grouping on and off.
3. Select the first of the Items (audio clips) in the Vox track. Hold down the **Ctrl** key while you select in turn each of the other two items for this track.
4. Press **G** to bind them into a group.
5. Click on any other item to select it. Now click again on the rightmost item in Vox items group to select that. Click and drag to the right then release the mouse. Notice that the whole group moves together.
6. Obviously, we don't really want to move our Vox items to this place. Press **Ctrl Z** to restore them to their former position.
7. Now select the first of the Vox items and press **U** to remove it from the group. Click and drag to the right the last of the Vox items – this time, the first item does not move with the group.
8. Press **Ctrl Z** to undo.
9. Now click on any media item outside the group. This deselects the group.



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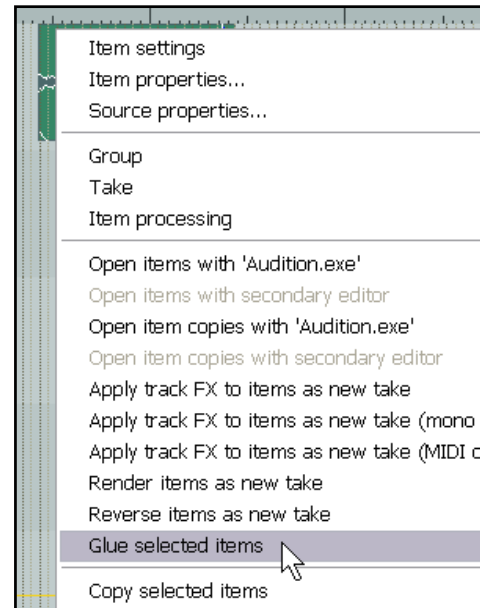
6.30 Glue Selected Items

Grouping items (above) is a useful technique to use when you wish to work with the various items as a group temporarily, whilst also ensuring that each item can still retain its individual properties. When you group items, you will be able to later remove items from the group and adjust any of the settings in that item's *Item properties* window should you wish to do so.

However, if you wish to permanently treat the items as one, you should consider using the **Glue selected items** command to do this. When you glue items together, they become one. For example, two MIDI items glued together will open together in the same MIDI Editor window. Two audio items glued together will now share the one *Item properties* window. Keep in mind that items that have been glued together can be later split up any way you wish. This can be useful if you later realise that you need to adjust one or more properties (such as perhaps panning or playback rate) of a portion of a glued item.

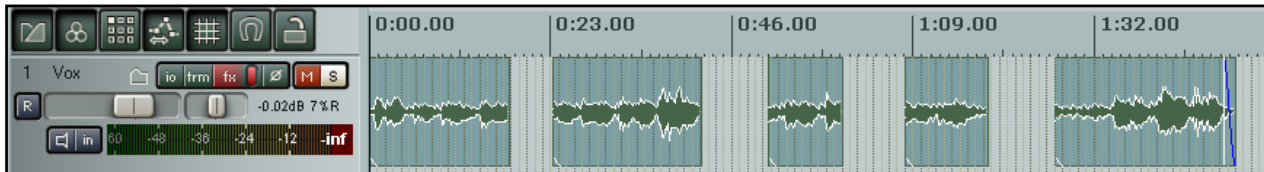
To glue together a number of adjacent items in a track, follow this procedure:

1. Select all of the items that you wish to glue. The easiest way to do this is probably to right click and drag the mouse across the items.
2. Right click over any item in the selection and choose **Glue selected items** from the context menu.

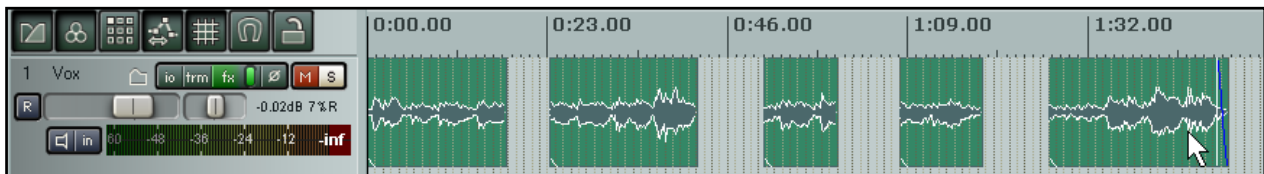


Example

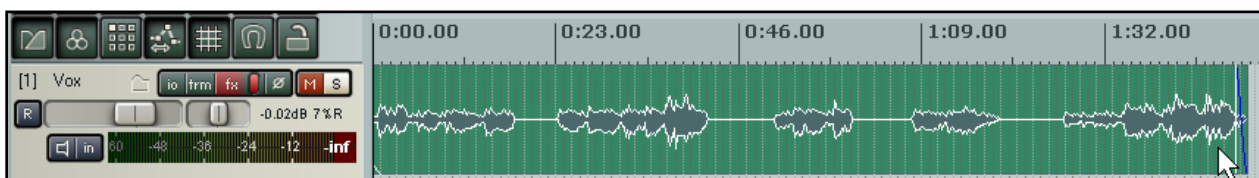
In the example shown below, a track is made up of five separate media items:



By positioning the mouse initially over the first item, then right clicking and dragging to the fifth item before releasing the mouse, we ensure that all items are selected.



We then right click over this last item (where the mouse is shown above) and choose **Glue selected items** from the menu. As a result, the five items are joined into one, as shown below.

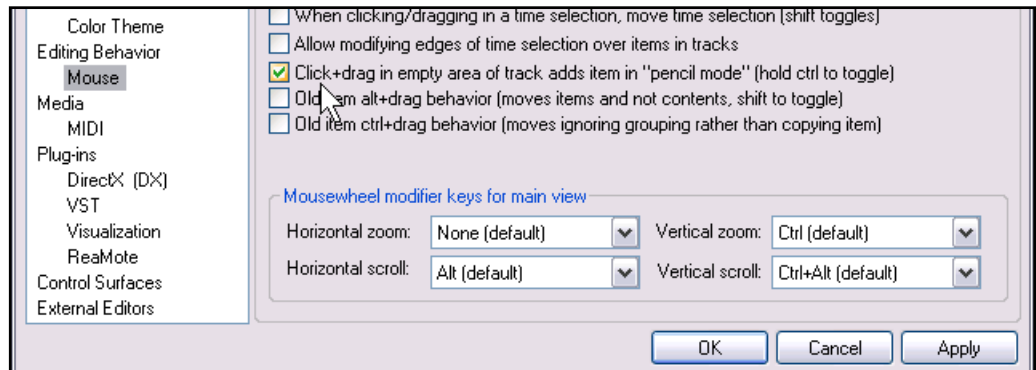


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6.31 Creating and Copying Items in Pencil Mode

REAPER includes an optional pencil mode that can be used to either create new media items or make copies of existing ones.

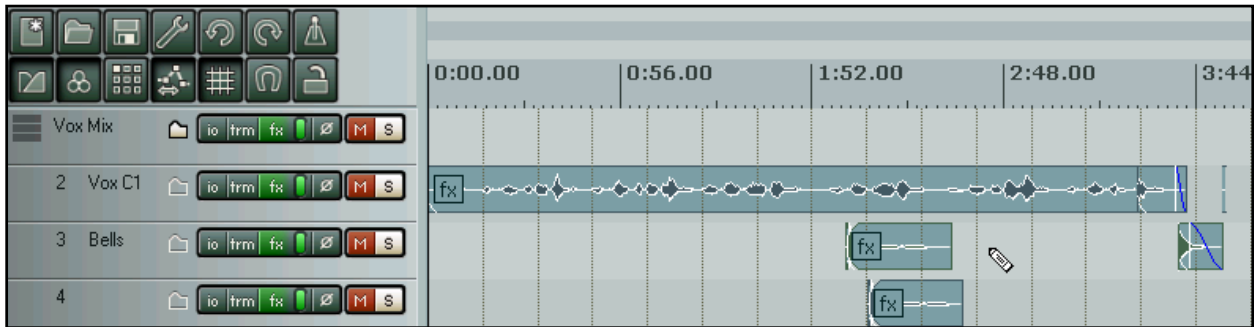
How the feature works is determined through the **Click and drag in empty area of track adds item in pencil mode** option.



This option can be found on the **Editing Behaviour, Mouse** page of the **Options, Preferences** window.

If this option is enabled, clicking and holding your left mouse button over any empty area of the track background area accesses pencil mode. Otherwise, you will need to hold the **Ctrl** key while clicking to use pencil mode.

When pencil mode is engaged, the mouse cursor will change to resemble a small pencil (as shown below) whenever the mouse is hovered above an empty area of the track view window. You can then click and drag to create the required item.

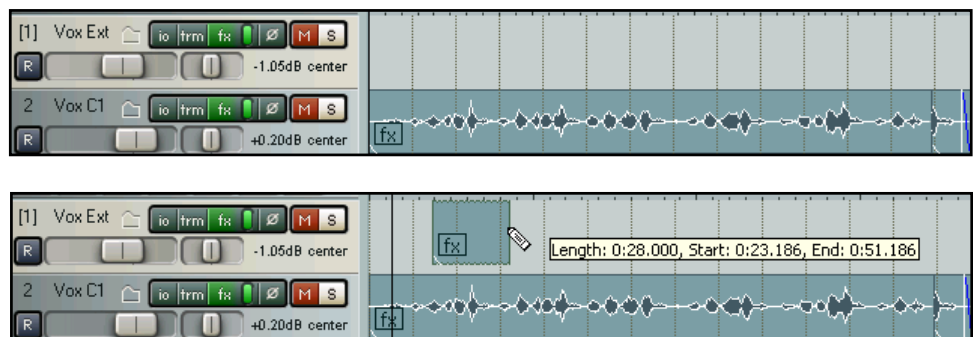


Examples

To add empty media items to an empty track....

With no media item selected, click and drag across any part of an empty track to add an empty media item.

The top illustration shows the empty track in its initial state. The one below it shows the same track after an empty media item has been added in pencil mode.

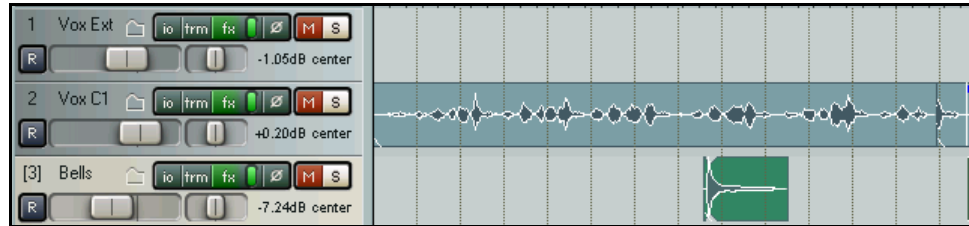


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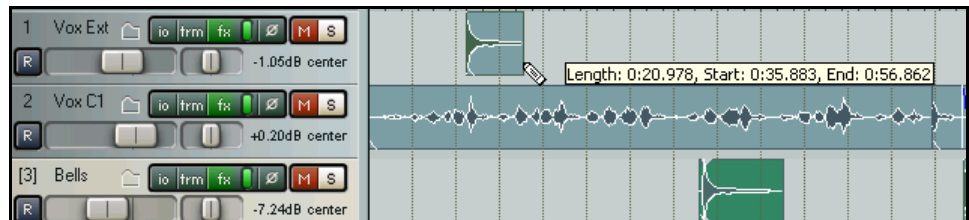
To make a copy of an existing media item....

You can make a copy of any existing media item by simply selecting that item, then clicking and dragging with pencil mode engaged at the location or locations where you want the items to be created. These can be on the same track as the selected item, or on any other track.

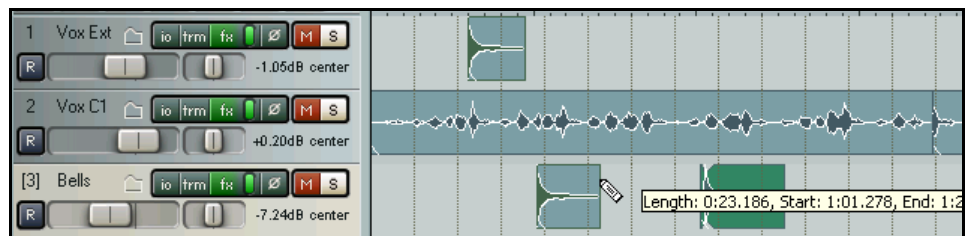
In the first screen shot, a single media item has been selected.



In this second screen shot, pencil mode is then used to create a duplicate of the selected item, and on a different track.



In this third illustration, pencil mode is used again, this time to create a duplicate item on the same track as the selected item.



Tip: Remember that you are able within your **Snap/Grid Settings** to determine whether media items, including those created in pencil mode, should be automatically snapped according to your snap settings.

6.32 Ripple Editing

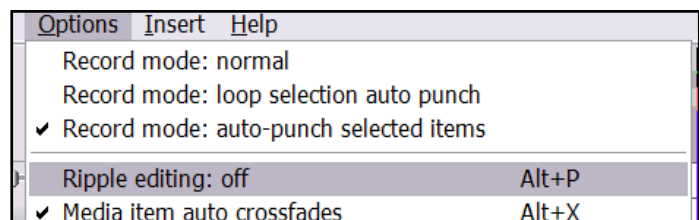
Ripple editing is a good way to perform an edit within a busy timeline and maintain sync relationships. When you perform a ripple edit, you are essentially adjusting the duration of a clip by manipulating its In and Out points and by doing so, the clips beyond the edit points are adjusted by the same value.

To access Ripple Editing, choose the **Options, Ripple editing** command, or use the keyboard shortcut **Alt P**. The same action (choosing the command or using the shortcut) toggles the Ripple Editing status between three states:

Off: This is the default mode. Items will not shift when you do edits on a track.

One Track: If you select the ripple editing option once, it will select one track ripple editing. This means anything you do to items on that track will affect other items of the same track.

All Tracks: If you select the ripple editing option once more, it will enable the All tracks ripple editing. This means anything you do to ANY of the items on ANY track will affect the ENTIRE project. Helpful for deleting entire sections of songs.

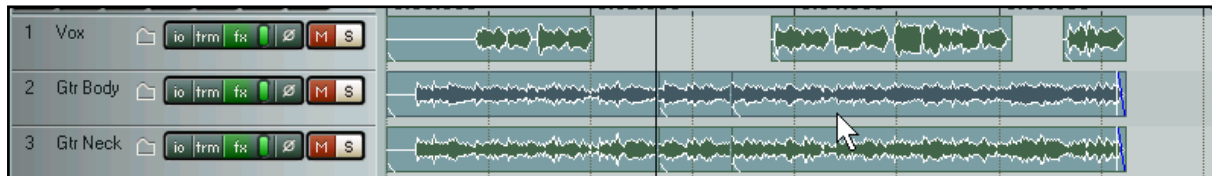


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In this mode, markers and automation are locked to the items that they relate to, so as you move items the associated markers and automation move too. Using this mode on multiple tracks is very useful for editing multitrack recordings of live material - everything that belongs together stays together in sync as you edit. Conversely, using this mode with an item on a single track makes REAPER behave rather like a stereo editor.

For instance, if you split the item at a couple of places (so you now have three items) then delete the middle piece, the remaining pieces join up, but unlike with a normal stereo editor, you can adjust the join by dragging the ends of the items appropriately. If you want to move material from one place to another, you can split at the insertion point, drag the material to the right of the insertion out of the way, then make the insertion and drag the displaced material to join it. All items to the right of the dragged item will stay together and markers and automation will move correctly too.

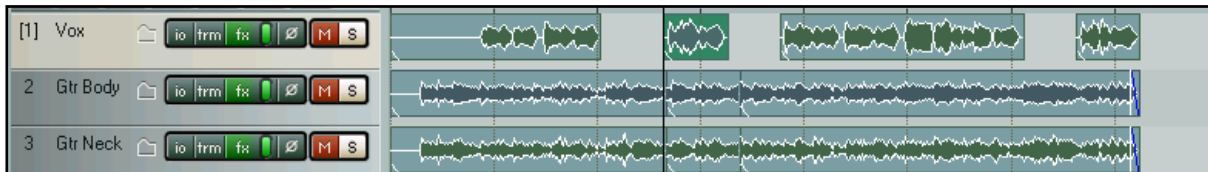
Examples



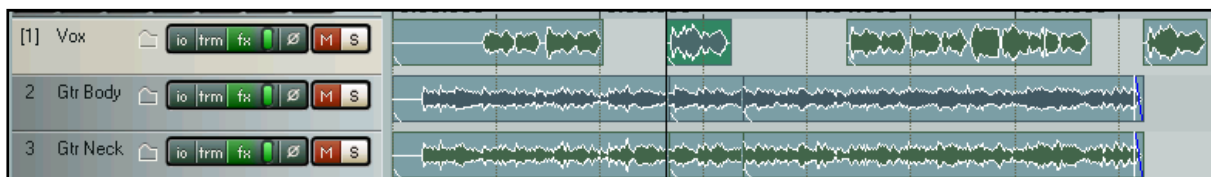
The three illustrations below show the effect of copying the third media item in the first track shown above, then pasting the copy in between the first two media items on the same track.

In the first instance, Ripple Editing is set to **Off**. In the second instance, Ripple Editing is turned on for just the **One Track**. In the third instance, Ripple Editing is turned on for **All Tracks**.

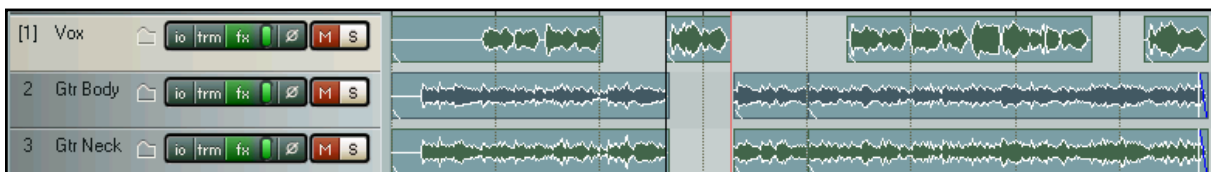
Ripple Editing Off:



Ripple Editing One Track:



Ripple Editing All Tracks:



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Notes

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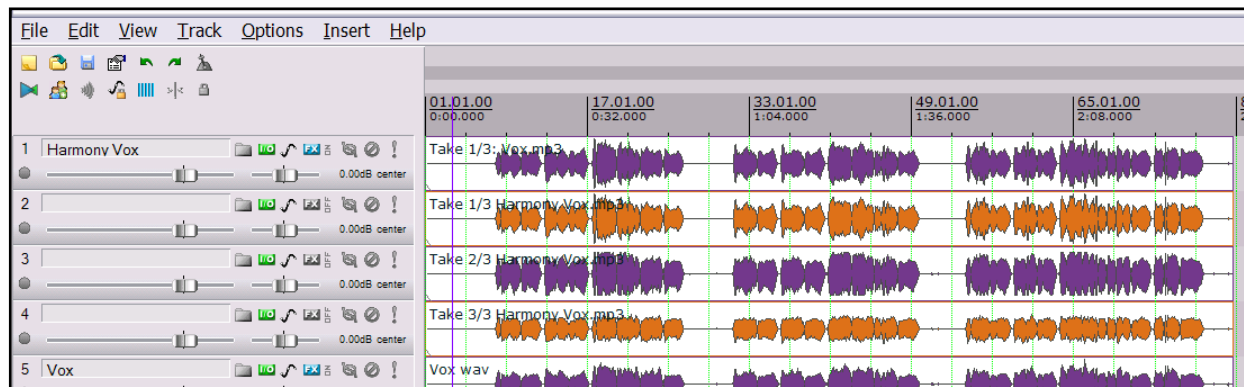
7 Working With Multiple Takes

7.1 Arranging and Editing Multiple Takes

Earlier, in Section 3, we looked at an example of how you can [create multiple takes](#) when you are recording.

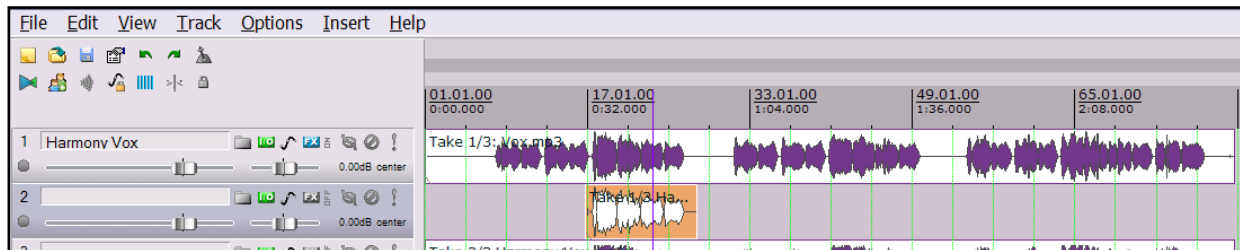
The editing and arrangement techniques that you have already learnt can also be applied to editing a project with multiple takes. Of course you have a number of options at your disposal for doing this. This example is intended really to get you thinking about how you might approach the task.

Let's return to the example that we used earlier, where we have recorded three takes of a vocal harmony track. Here we have used the **Edit, Take, Explode all takes to new tracks** command.



Notice that this command creates three extra tracks – the original track with its three takes is still intact. After auditioning, we have decided which parts we want to use from each take.

In the next illustration, we have edited the first take to leave only the portion of that take that we wish to keep. This has been done by selecting that track, then hovering the mouse in turn over the border at each end of the track, then (after seeing the mouse change to a double headed horizontal arrow), clicking and dragging to the required position:

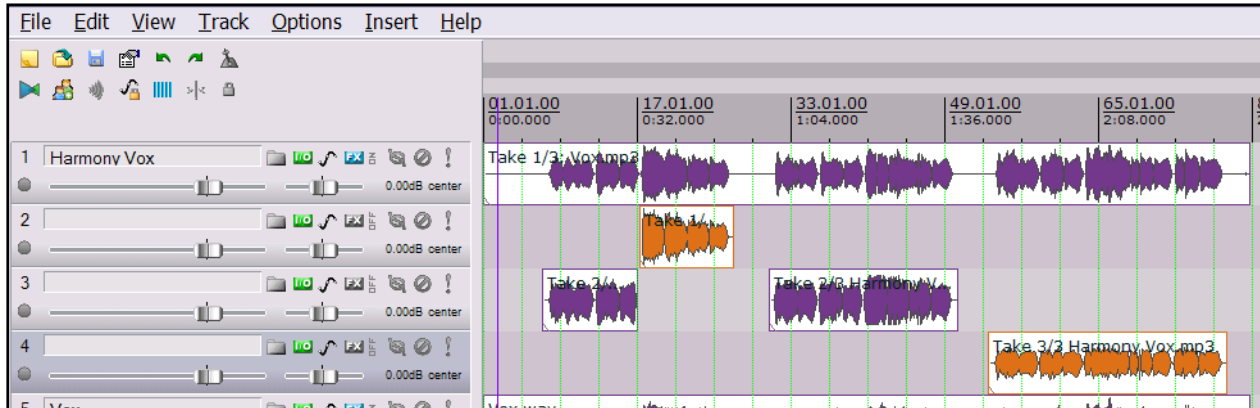


In the picture that follows (next page), we have selected the second take and used the same technique to remove the last third of that take.

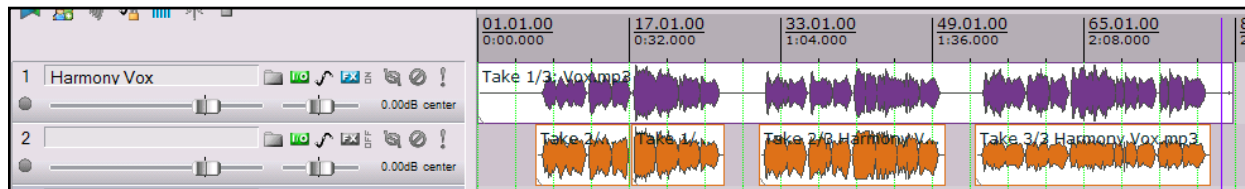
Keeping the same item selected, we have then used the timeline to select the region to be deleted from this take (for illustration purposes, this is shown as still selected), then pressed **Shift S** (the **Split items at Time Selection** command), followed by the **Delete** key.

The third take has then been edited in much the same way as the first.

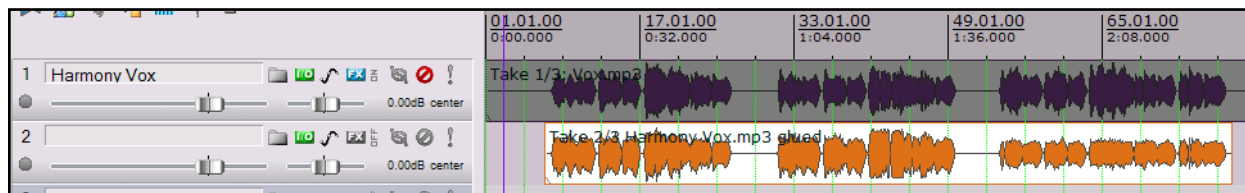
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Next, we have selected first the two items for Take 2 (shown above as Track 3) and, with **Num Lock** engaged, pressed the **Num 8** key to move them up to the track above it. We have then repeated this for the remaining item, that in Take 3 (shown above as Track 4).



Finally, in Track 2, we have selected all the items, right clicked over the selection and used the **Glue Selected Items** command to bind them together as one media item.



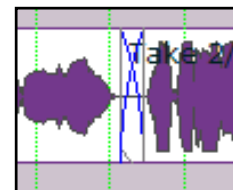
Notice here that we have muted the original track with the three original takes on it. This makes it easy for us to change our selections that have gone into making up the new Track 2 if we wish to.

Try it now! *If you experimented with recording three vocal harmony takes in Section 3.13, now's the time to experiment with editing and arranging them.*

7.2 Crossfades

If when you are arranging items in this way two items overlap, then by default REAPER will add a crossfade. The curves of this crossfade can be edited like any other. You can extend the crossfade in either direction by moving the fade bars (so long as there is material left in the item) and that if you press shift while dragging the crossfade, you can slide it bodily to a new crossfade point.

Using these techniques can ensure that an otherwise abrupt edit is smoothly disguised by a gradual transition at the best edit point.



Tip: *To change the shape of any crossfade curves, hover your mouse over the curve so that the mouse itself takes on the appearance of a fade curve. Then right-click for a menu with a selection of different curves.*

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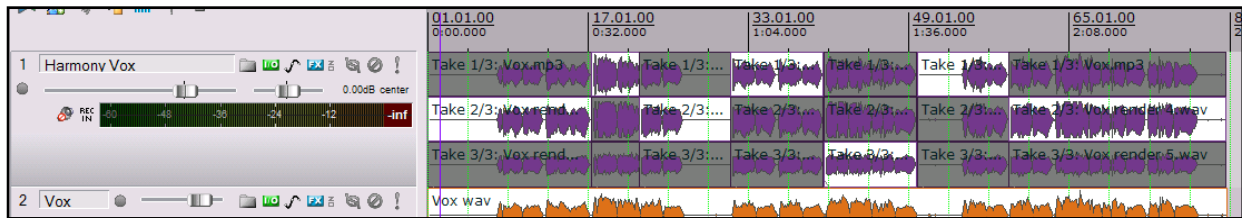
7.3 More About Working with Multiple Takes

We've already seen some ways how Multiple Takes can be recorded and used in REAPER. This section will show you some special techniques that make multiple takes so useful.

Slice and Dice

When you choose the **Option** to **Show all takes in lanes (when room)** there is a neat technique known as *slice and dice* that helps you combine the best of each take together, to play as one track.

To do this, you simply **Split** the track in as many places (and at the exact points) that you think appropriate, then select from each slice your preferred section. An example is shown below:



Track 1 has been sliced in six places to create seven sections. For each section, the take shown with the light background has been selected. When the track is played, they will play seamlessly together as if they were a single take. After completing the *slice and dice*, there's no need any longer to show the separate layers:



You can also right click over the track's media items and choose the **Take, Crop to active take** command to discard the unwanted segments.

Tip: When you use Lanes and Slice and Dice in this way, you can use the Num Pad keys 1 and 3 to slide items left or right if their timing is slightly out of sync with other takes. The exact amount by which these keys will slide your selected media item(s) will depend on how closely you are zoomed in or out.

Play All Takes

You have the option, if you wish, of playing all takes in a track. You might wish to use this, for example, for a double-tracking or vocal harmony effect. Just right-click over one of the takes and choose **Item settings, Play all takes**.

Explode and Implode

For more sophisticated editing, you will still prefer to use the **Take, Explode all takes to new tracks** command from the context menu. This enables you to work on each take as a separate track, for example applying separate FX such as EQ, and perhaps using the **Apply All FX to Items** command.

After you have performed your edits, you may use the **Take, Implode selected items across tracks into takes** command to restore your takes back to the one track.

These commands are examined in more detail in the section that follows.

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7.4 Takes or Tracks?

When you start work on a project, it won't always be obvious to you whether it is better at the time to record multiple takes as separate tracks or as one track. This doesn't really matter, because REAPER allows you to change your mind.

For example, if you start with multiple tracks, you have two options for converting them to takes.

To convert multiple tracks to takes:

1. Select the media items in all of the tracks.
2. Right click over the selection.
3. From the context menu, choose **Takes**.
4. From the submenu (shown above), choose **Implode selected items across tracks into takes**.

Next take	T
Previous take	Shift+T
Delete active take	
Crop to active take	Alt+Shift+T
Duplicate active take	
Show FX chain for active take	Shift+E
Remove FX for active take	
Explode all takes to new tracks	
Implode selected items across tracks into takes	
Implode selected items on same track into takes	

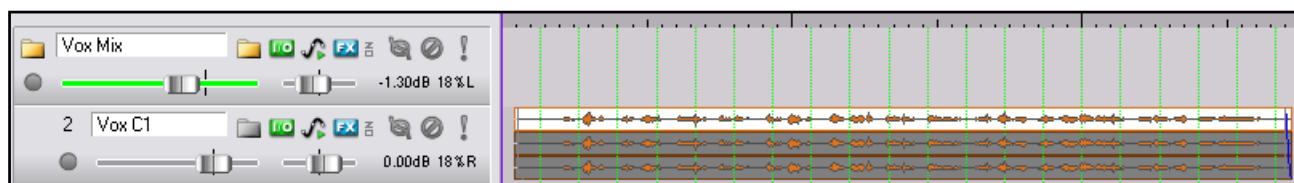
Notice that a similar technique can be used to implode selected items on the same track into takes.

To paste selected items into takes

1. Select the media items that you want pasted into another existing track as separate takes.
2. Press **Ctrl C**, or choose the **Edit, Copy** command.
3. Select and right click over the media item of the track where you want your takes added.
4. Choose **Paste to takes in selected items**.

To create separate tracks from multiple takes

Alternatively, you might have a situation (as shown below) where you have multiple takes on a single track, and you wish to convert them to separate tracks.



1. Select any of the takes in the track.
2. Right click over the selection.
3. From the context menu, choose **Takes**.
4. From the submenu, choose **Explode all takes to new tracks**.

Next take	T
Previous take	Shift+T
Delete active take	
Crop to active take	Alt+Shift+T
Duplicate active take	
Show FX chain for active take	Shift+E
Remove FX for active take	
Explode all takes to new tracks	
Implode selected items across tracks into takes	
Implode selected items on same track into takes	

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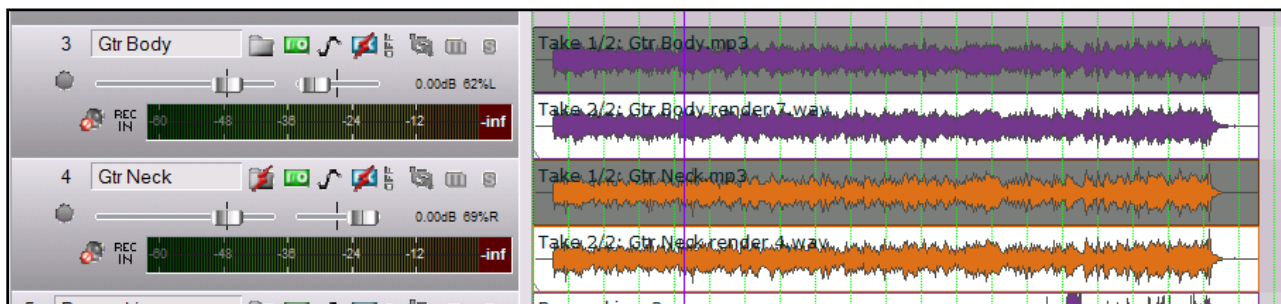
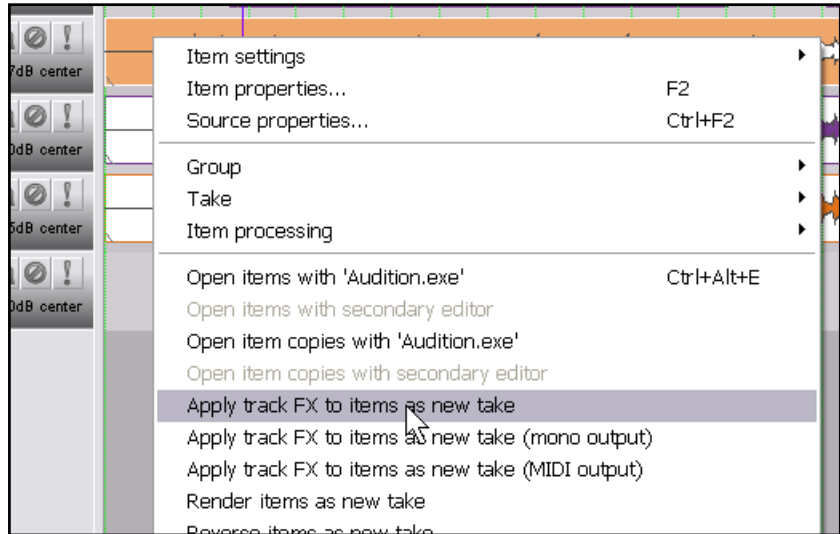
7.5 Applying FX to Items as New Takes

Another important use that you may have for takes is to apply track FX to items as new takes.

You might wish to do this if you are running low on CPU. Remember that you can configure REAPER's **Performance Meter** to show how much CPU is used by FX on a track by track basis.

Just suppose that you notice that one or more of your tracks are particularly CPU intensive. Here's what to do:

1. Select all of the tracks involved.
2. Right click over any of the selected media items and from the context menu choose **Apply track FX to items as new take** if you want a stereo take, or **Apply track FX to items as new take (mono output)** if you want your new take to be Mono. If the items are MIDI items, you may choose the option **Apply track FX to items as new take (MIDI output)**.
3. Make the new take active and click on the **FX enabled/FX disabled** toggle button for the track(s) in question.



Of course, at any time you can re-enable the Track FX, make any changes to the Track FX settings, or make changes to your track FX chain, and apply your changes again as a new take.

This process of applying a track's FX as a new take is in some respects similar to Stem Rendering. It effectively serves the same function as freeze and unfreeze in some other DAW applications.

Track FX and Per Item FX

When you apply any of the **Apply track FX to items as new take** commands, all Track FX and any Per Item FX on individual items will be applied.



Thus, in the example shown above, only the ReaEQ would be applied to the first item, but both the ReaEQ and the ReaDelay would be applied to the second item.

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7.6 Adding FX to Individual Takes

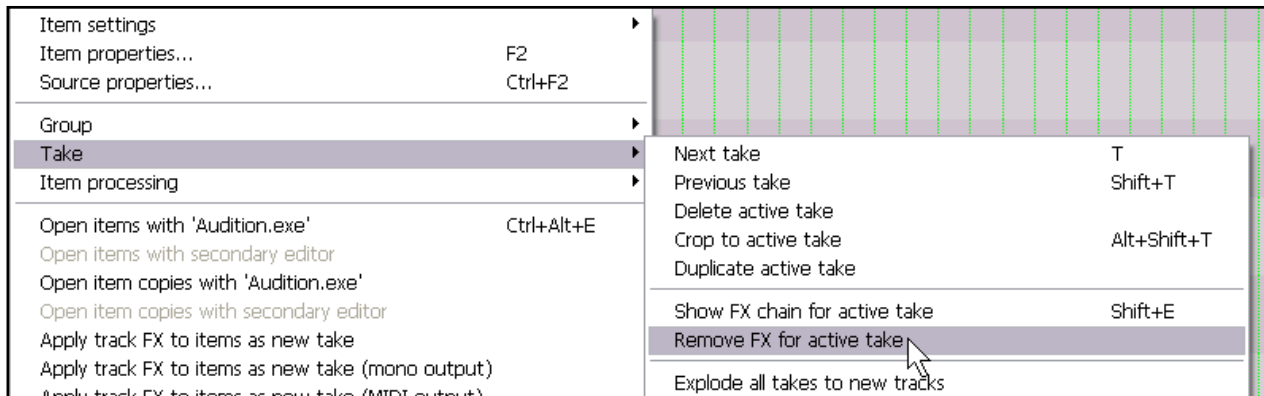
When you have a track with multiple takes, you can assign different FX to the different takes (as shown on the right).

Simply select any take and press **Shift E** (or click on the Take's FX button if it is already visible) to access the **Add FX** window for that take.



Remember too that you can use the *slice and dice* technique discussed earlier to switch between takes. This enables you to achieve some very interesting and creative sounds.

You can also use the **Take** right click menu to **Show FX chain for active take** or **Remove FX for active take** (shown below).



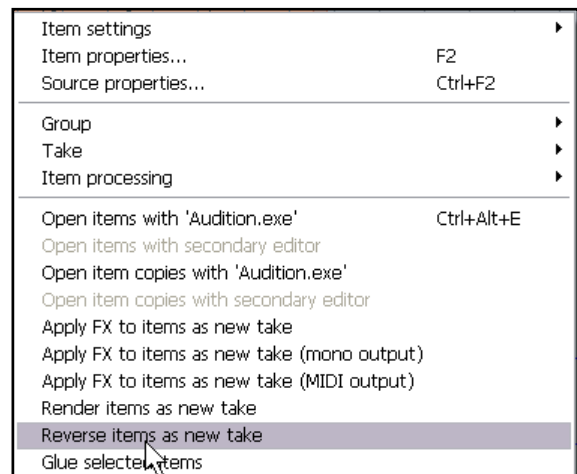
7.7 Reversing Items as New Takes

The **Reverse items as new take** feature of REAPER can be used to create some interesting effects. You can reverse an item as a new take by following this procedure:

1. Select the Media Item.
2. Right click over it.
3. Choose **Reverse items as new take** from the menu.

Notice that:

- If you wish to play both the original track and the reversed track together and at the same time, you can do so by selecting the item, pressing **F2** to display the **Item Properties** settings and selecting the option to **Play all takes**.
- If you wish to send the reversed take to a different track altogether, select the item, right click over it, then choose the **Take** command then **Explode all takes to new tracks**.

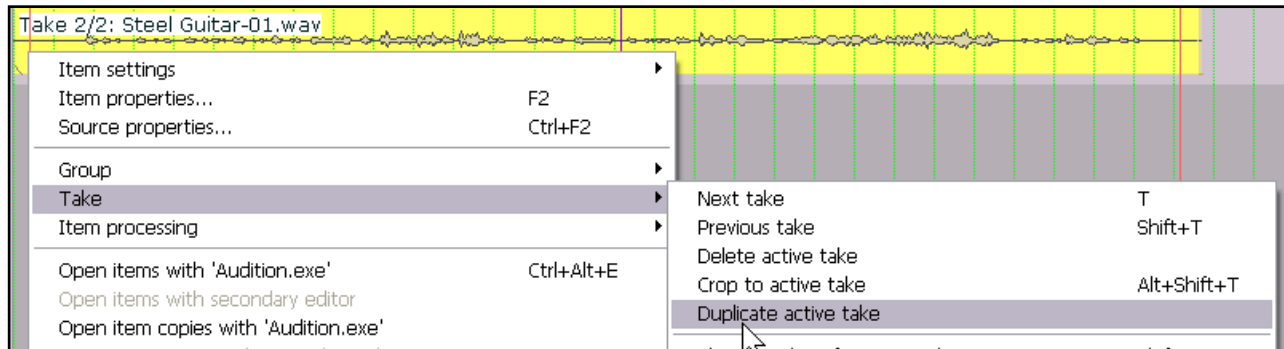


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7.8 Creating a Duplicate Take

To create a duplicate of any take, follow this procedure:

- Select the required take.
- Right click over the media item.
- From the context menu, choose the **Take** command, then **Duplicate active take** (see below).



7.9 Non Destructive Editing

We mentioned earlier that REAPER uses non-destructive editing. Here is a short demonstration of what this means in practice:

1. Position the Edit Cursor about 15 secs into the song and at that point select the media item for the first track in your file **All Through the Night EDITS.RPP**. There should be just one clip for the entire track.
2. Press **S** to split this track. The rightmost item should now remain selected.
3. Press **Delete** to delete this. That of course was a deliberate mistake. Of course, you could press **Ctrl Z** to undo this, but let's suppose that you've not noticed the mistake until perhaps a few days later.
4. Press **Ctrl S** to save the file, then close REAPER.
5. Open REAPER again, and make sure this file is displayed.
6. Position your mouse over the boundary between the end of your truncated item and the background area, so that it displays a double-headed arrow.
7. Click, hold and drag the mouse to the right all the way to the end of the song. Notice that the original clip is restored. All you need do is redraw your fadeout curve!
8. Save the file.

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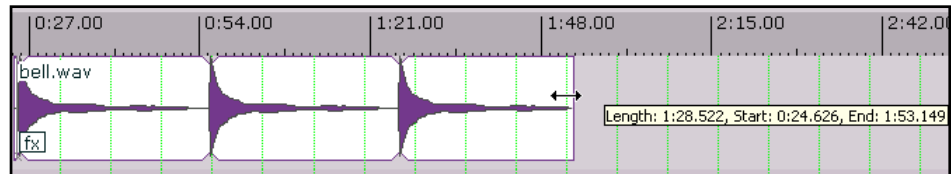
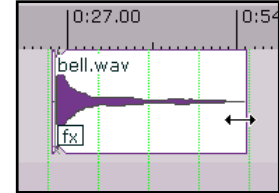
8 Loops, Markers and Regions

8.1 Creating Loops

Any Audio, MIDI or Click Source Item can be looped. The loop point is defined by the duration of the source Media. If you insert an item that is four bars long, it will loop every 4 bars, if it is 8 bars, it will loop every 8 bars, and so on.

To Loop an entire Item:

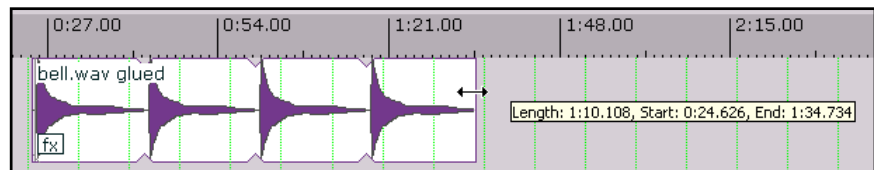
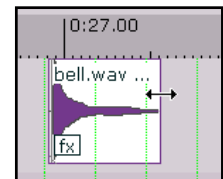
1. Hover the mouse over the an edge of the Item until the Cursor changes to a double-headed arrow (see right).
2. Drag the Cursor to extend the Item. Each loop point will be indicated by a notch in the edges of the Item. Extend the loop as required.
3. The length, start time and end time of the looped item will be displayed as you drag the edge of the loop.



Cropping and Looping:

If you wish to loop only part of an item, then the item must first be cropped and glued.

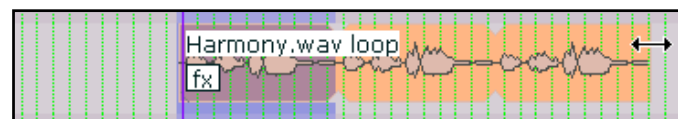
1. As before, hover the mouse over the edge of the Item until the Cursor changes to a double-headed arrow. Drag the mouse in on the item to make it shorter, so that you are left with only that part of the item that you want to use as the basis of the loop.
2. Right click over the item, and from the menu choose **Glue selected item**.
3. Now drag the Cursor to extend the Item. Each loop point will be indicated by a notch in the edges of the item. Extend the loop as required.



Creating a Loop from a Time Selection

Another method is to select the required item, highlight the required part of the item as a time selection, right click, choose **Copy loop of selected area of items**, remove the original, then paste in the loop in its place. This is shown here:

1. Select the area that you wish to loop (see right). Right click and choose **Copy loop of selected area of item**.
2. Right click again over the item and choose **Remove selected items**.
3. Press **Ctrl V** to paste in the area to be looped.
4. Drag the cursor from the edge of the item as before to create the loop.



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8.2 Creating Markers

Markers are like bookmarks. They can help you when you are navigating, arranging and editing your projects.

Markers are inserted at the current Edit Cursor position. They can be inserted at any time, whether or not the project is being played.

Command	Default Shortcut	Effect
Insert Marker	M	Inserts numbered Marker at present position
Insert Marker (and prompt for name)	Shift M	Inserts numbered Marker at present position and prompts for a marker name.
Right click mouse over Marker		Displays menu with options to Remove Marker or Edit Marker

Working With Markers

Default Keyboard and Mouse Shortcuts for working with markers are:

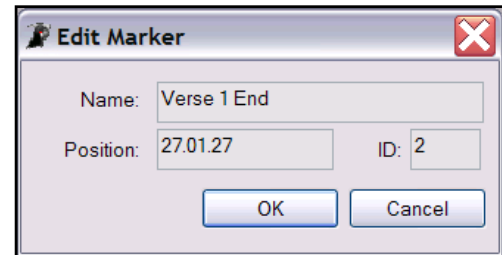
Mouse/Keystroke	Default Function
1 <i>on main keyboard, not Num Pad.</i>	Go to Marker 1
2 <i>on main keyboard, not Num Pad.</i>	Go to Marker 2
3 <i>on main keyboard, not Num Pad.</i>	Go to Marker 3
4 <i>on main keyboard, not Num Pad.</i>	Go to Marker 4
5 <i>on main keyboard, not Num Pad.</i>	Go to Marker 5
6 <i>on main keyboard, not Num Pad.</i>	Go to Marker 6
7 <i>on main keyboard, not Num Pad.</i>	Go to Marker 7
8 <i>on main keyboard, not Num Pad.</i>	Go to Marker 8
9 <i>on main keyboard, not Num Pad.</i>	Go to Marker 9
0 <i>on main keyboard, not Num Pad.</i>	Go to Marker 10
]	Go to next Marker or Project End
[Go to previous Marker or Project Start
Right Click on Transport Bar	Displays menu. Choose Jump to marker to go to any Marker.
Double click on timeline between two markers	Select area between the two markers.
Click and drag marker along timeline	Moves the Marker.
Double click on Marker	Edit the Marker.
Alt Click on Marker	Remove the Marker.

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Example

This example illustrates the use of markers.

1. Open the sample file **All Through the Night.RPP** and straightaway save it as **All Through the Night MARKERS.RPP**
2. Play the song. Just before the place where the vocal starts. Press **Shift M**. When prompted, type as the name **Verse 1 Start** and press **Enter**
3. At the end of the first verse, press **Shift M** again, name this marker **Verse 1 End** and press **Enter**.
4. Create similar markers for the start and finish of Verse 2 and Verse 3. These will be at or around 1:00, 1:38, 1:46 and 2:35
5. Save the file.
6. Press **1** on your keyboard (not the numeric keypad). Notice the edit cursor jumps to the start of Verse 1.
7. Press **2**. Notice it jumps to the end of Verse 2.
8. Double click on the Timeline between markers 2 and 3. Notice that this area is now selected.
9. Right click over the timeline and choose **Zoom selection**. You could now do any close editing work required for this selection.
10. Press **Esc** to clear the selection, then **Ctrl PgDn** to restore the whole project to view. Save the file.

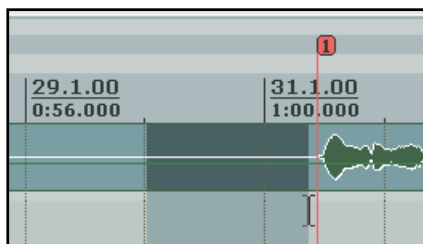


8.3 Snapping to Markers

Optionally, you may wish to ensure that when you are making a time selection, the boundaries of the selection will automatically snap to nearby markers at the start and/or end of the time selection (if any such markers are present).

Consider the **Snap/Grid Settings** shown on the right. Notice that snapping has been enabled, with a snap distance of 10 pixels defined.

With snapping *disabled*, it can be quite difficult to make a selection which ends exactly at a marker. When you attempt to make such a selection, you might end up with the selection shown in the first of the screen shots below. Notice that the end of the selection falls a little short of the marker.



Notice the effect of making exactly the same selection with the above snap settings disabled (left) and enabled (right).

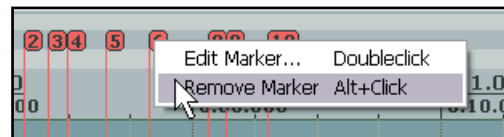
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8.4 Removing Markers

There are two main methods of removing unwanted markers.

To remove a single marker ...

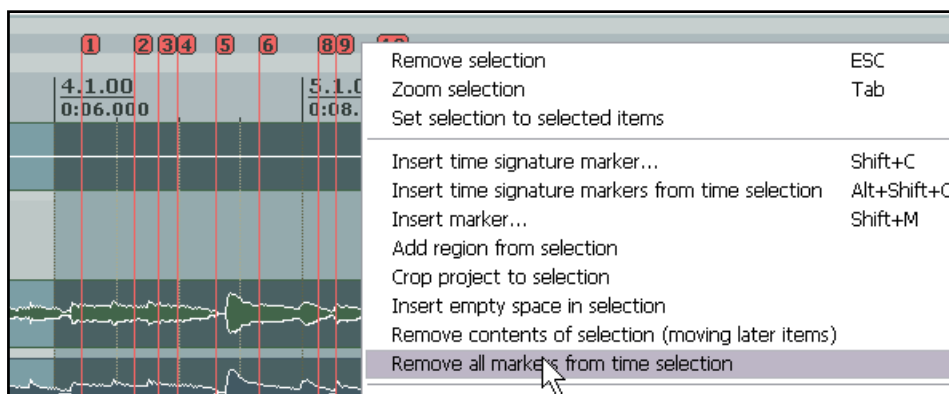
Position the mouse over the marker “flag” and hold down the **Alt** key while you click the left mouse button. Alternatively, you can right-click over the marker and choose **Remove Marker** from the context menu.



To remove a series of markers ...

Define a time selection that includes all of the markers that you wish to remove.

Right click over the space between any two marker “flags” within the time selection, and choose **Remove all markers from time selection** from the context menu.



8.5 Regions

Regions essentially take the idea of markers one step further. You can create regions for your projects, making it easy to identify, select and work with different passages of a song.

Mouse/Keystrokes/Command	Effect
Shift R or Right Click, Add Region from Selection	Create a new region, based on the current selection.
Double click on Region icon.	To change name or other properties of the region.
Double click on region icon, or Right Click on region icon, Select Region	Makes the area of the region the current selection
Alt Click on region icon	Removes the region.

To create a Region from two existing Markers ...

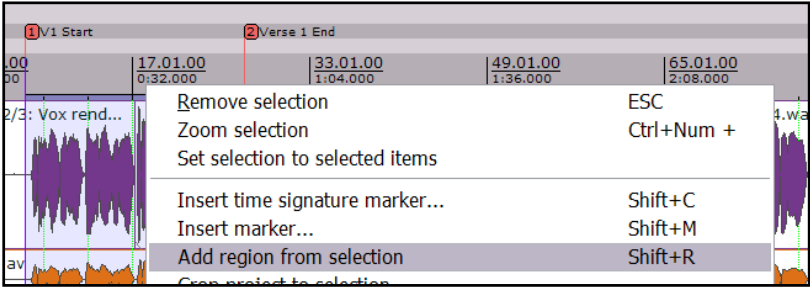
1. Make sure the **Option** for **Looped points linked to time selection** is enabled.
2. Double click above the timeline between the markers to make the selection.
3. Right click and choose **Add region from selection**.

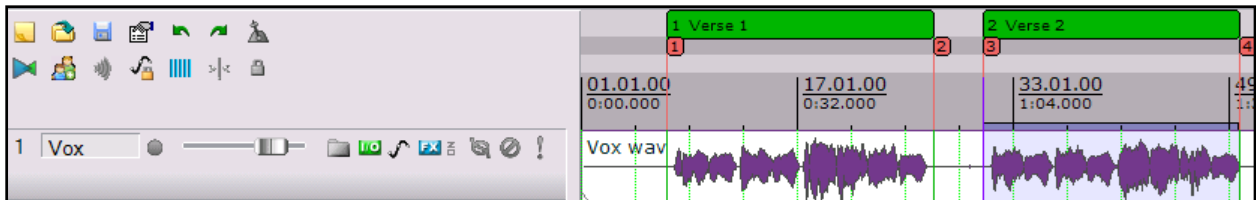
To create a Region from scratch ...

1. Click and drag across the background area of the Track View to make the selection.
2. Right click and choose **Add region from selection**.

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Example of working with Regions

1. Make sure that the **Option** for **Looped points linked to time selection** is enabled.
2. In the file **All Through the Night MARKERS.RPP**, double click on the timeline between your first two markers. This causes this area to be selected.
3. Right click over the timeline, close to the first marker, and choose **Add Region from Selection**.
4. Right click over the new region's icon, then choose **Edit Region**. Type **Verse 1** and press **Enter**.
5. Double click on the timeline between markers three and four to select this area. Press **Shift R** to define a region. Right click over the icon for this region, choose **Edit Region**, type **Verse 2** and press **Enter**.
6. Repeat this process using the area between markers five and six to create a Verse 3 region. Keep this region selected.
7. Press **Ctrl** with the **+** on the Numeric Pad. This zooms in on that region.
8. Press **Ctrl PgDn** to restore the whole project to the screen.
9. Press **Esc** to remove the current selection.
10. **Save this file.**

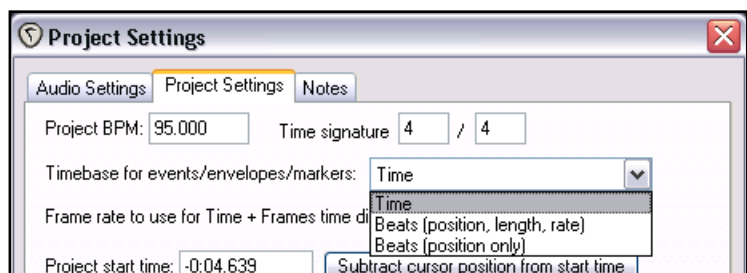


Tip: Once you have created regions, you can move them around, by dragging and dropping the Region Marker, just above the Timeline.

8.6 Changing the Timebase

You can select Time, Beats (position, length, rate) or Beats (position only) as the timebase for your envelopes, events and markers. To do this:

1. Press **Alt Enter** to display the **Project Settings** window.
2. Make your choice from the drop down list (right), then click on **OK**.



You can also change the beat by clicking in the **BPM** box (beneath the Track Area) and entering a number.

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9 More Project Management Features

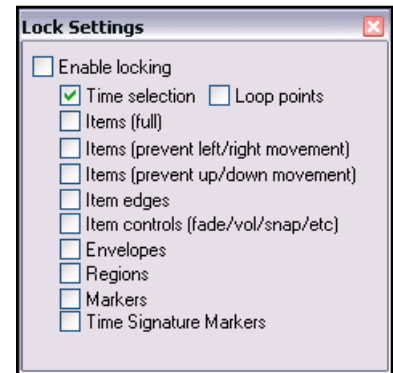
9.1 Locking Items

The Locking feature of REAPER can be used to effectively freeze certain aspects of a project file to prevent something accidentally going wrong.

There are two aspects to locking:

- Deciding which project elements you would like to be locked.
- Enabling or disabling the locking feature.

The table below summarises some of the ways in which you might be able to make use of this feature.



Locking Option	Comment
Time Selection	This locks the current time selection so that, for example, if you accidentally click and drag at some other point along the timeline your time selection will remain unchanged. You can remove a locked time selection by pressing Esc then selecting Yes when prompted.
Loop points	Locks currently selected loop points.
Items Full	This option prevents you from making any changes at all to any of your existing media items. For example, you cannot delete them, move them, slip edit them, or even access the Item Properties window for any of your items.
Items (prevent left/right movement)	This option allows you to make any other changes you like to your media items except move them left or right.
Items (prevent up/down movement)	This option allows you to make any other changes you like to your media items except move them up or down.
Markers	Locking markers prevents you from changing (for example by moving, deleting or renaming) existing markers. However, you will be able to create new markers with Lock Markers enabled.
Regions	Locking regions prevents you from changing (for example by moving, deleting or renaming) existing regions. However, you will be able to create new regions with Lock Regions enabled.

Example

Let's suppose that we are happy with the way our media items line up, and we don't want any of them being accidentally nudged or moved to the left or right. You might wish to lock their horizontal position.

1. Choose the **Options** command, then **Locking Settings**.
2. Tick only **Items (prevent left/right movement)**.
3. Close this window.
4. Display the **Options** menu again – if **Locking Enabled** is not selected, turn it on.
5. Now try to drag and drop any of your items to the left or right. They won't move.
6. Press the **L** key – this toggles locking off again.

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9.2 Creating Interactive Macros

We've already seen how keyboard shortcuts can be created and used to execute REAPER commands and actions, and even to chain a sequence of up to six such commands or actions together.

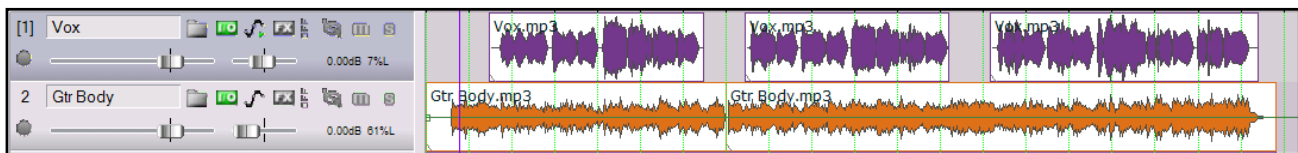
Taking this idea one step further, you can also create interactive macros – that is, where at various steps during the execution of the commands, REAPER will pause and wait for some input or information from you.

Example

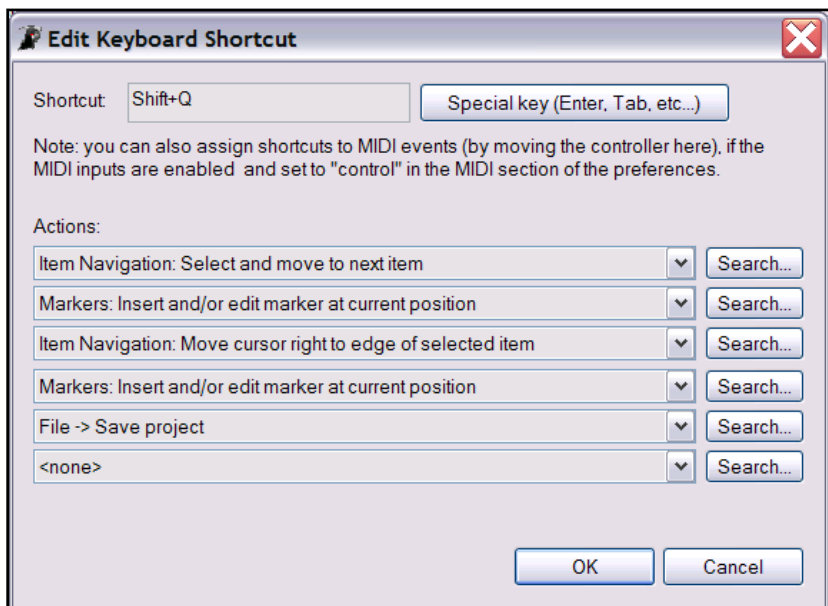
In this example we will create a macro that will:

- Create a marker at the start of any selected media item in any file.
- Wait for you to name it.
- Create a marker at the end of any selected media item in any file.
- Wait for you to name it.
- Save the file.

Take look at the project file shown here. The vocal track is made up of three items.



1. Open one of your **All Through The Night** project files and save it as **All Through the Night MACRO.rpp**.
2. +Make sure that the Vocal track is split into three items, as shown.
3. Choose the **Options, Preferences** command and select the **Keyboard/Control** page.
4. Click on the **New** button then press your preferred Shortcut Key(s) – in the example shown we have used **Shift Q**.
5. Define the five actions shown (right).
6. Click on **OK**.
7. In the Track Control Panel, select the Vox track and position the cursor near the start of the song.
8. Press the shortcut keys for this macro, e.g. **Shift Q**.
9. When prompted for a marker name, type **V1 Start** and press **Enter**.
10. When prompted again, type **V1 End** and press **Enter**.



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11. Your screen will now resemble that shown below:

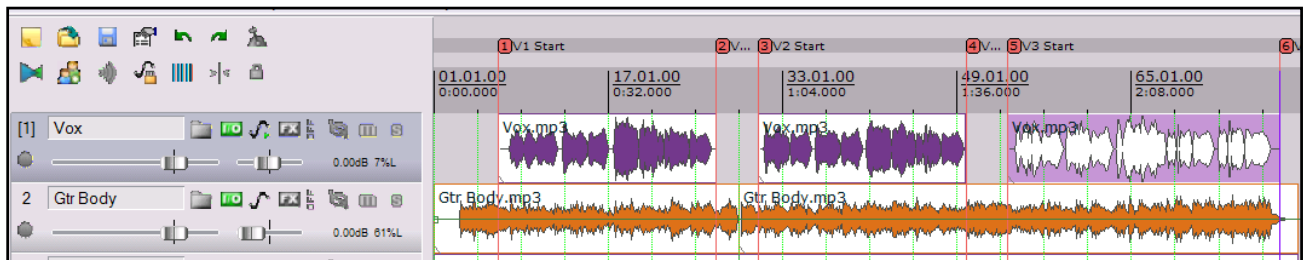


12. Press the keyboard shortcut for your macro again. Notice that the cursor moves to the start of the next item and you are again prompted to enter a name. Type **V2 Start** and press **Enter**.

13. You will again be prompted. Type **V2 End** and press **Enter**.

14. Now run the macro again, entering when prompted marker names for the start and end of your third media item.

15. Your screen should now look like this:



9.3 Using Screen Sets

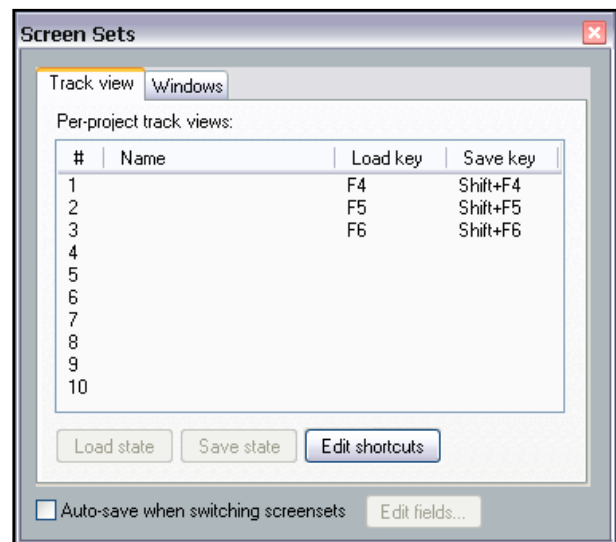
Screen Sets enable you to save several different states or views of your project, so that you can easily select and recall them when editing or arranging. There are two types of Screen Sets that you can use – Track Views and Windows. **Track Views** are created and saved on a per project basis, whereas **Window** screen sets are global.

Creating and Using Track Views

The procedure is as follows:

- You use the **View, Show Screen Sets** command to show or hide the Screen Sets window (or the default shortcut, **Ctrl E**). Notice that the Screen Sets window may be docked (or undocked), using its context menu.
- Adjust your track layouts to suit.
- Select a Screen Set number from the Track Views page of the Screen Sets window.
- Click on **Save State** and give the set a name.

You can create up to 10 Track View screen sets. To recall a view, you simply double click on its name. You can also assign keyboard shortcuts to individual screen sets. Click on the **Edit Shortcuts** button in the Screen Sets window to access the **Keyboard Control** page of **Options, Preferences**. By default, **F4** to **F6** are



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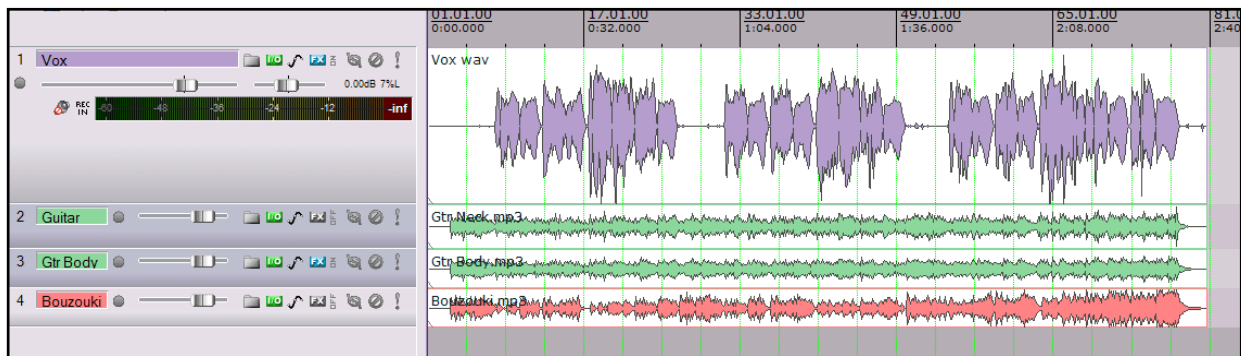
assigned to load each of your first three Track Views (as shown), and **F7** to **F9** to load your first three Windows Views.

Notice that there is also an option available to **Autosave when switching screensets**. If enabled, this ensures when switching from one screen set to another that any changes made to the layout of the first of these screen sets will be saved.

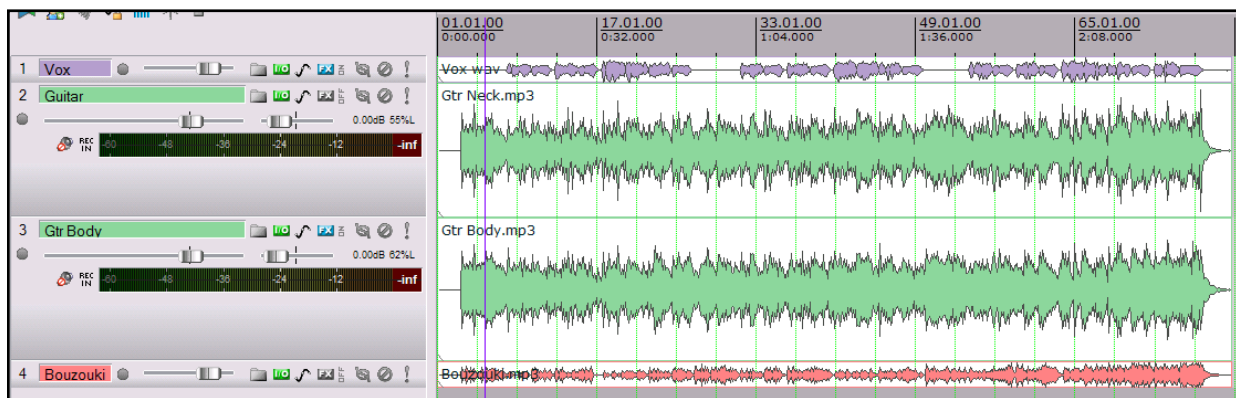
Track view screen sets can be especially useful for editing media items and when you are working with envelopes. Envelopes will be covered in Section 13 of this User Guide.

Example

1. Open the file **All Through The Night.RPP** and save it as **All Through The Night SCREENS.RPP**.
2. If you wish, use the right click track control panel menu for these tracks to set different track colours for your tracks. This is done with the **Set selected tracks to custom colours** command.
3. Adjust the track height of your **Vox** track as shown:



4. In the Track View page of the Screen Sets window, click on 1., then **Save State**, then type: **Vox View** then press **Enter**.
5. Now adjust the tracks view as shown below:



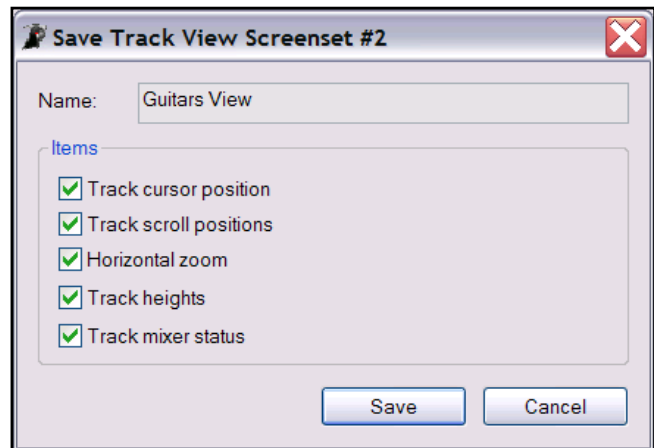
6. Assign Track View number 2 and save it as **Guitars View**.
7. You can now switch between these two track layouts by double-clicking on their names in the Screen Sets window.

Note that this simple example serves only to introduce you to screen sets and how to use them. They can be more powerful than just this. Notice that when you create a Track View screen set, there are a number of options that you may choose to include in or exclude from the view:

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- Track Cursor Position
- Track Scroll Position
- Horizontal Screen
- Track Heights
- Track Mixer Status

One use of Track View Screen Sets can be to switch between different selections of tracks to be displayed in your Mixer. For example, one set might be used to show child tracks only, another to show only those tracks that have receives.

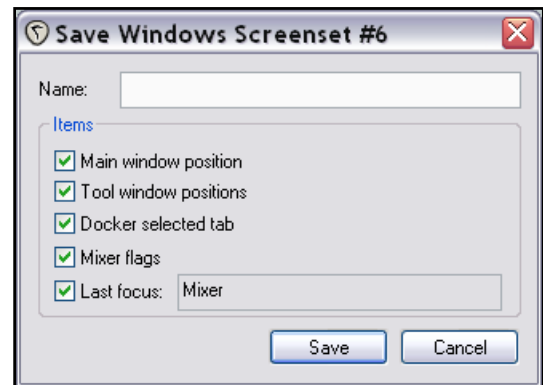


Creating and Using Global Window Views

Unlike Track View Screen Sets, Windows Screen Sets are not project specific, but can be applied to all your projects.

The procedures for creating Window Views are similar to those used for creating Track Views.

- Decide which windows and views you want displayed, and how you want them laid out.
- In the Screen Sets window, select the **Windows** page, select a number and save your layout.
- To recall and open any layout, simply double-click on its name.
- To change a layout, open it, make the changes, then save it back to the same name.



When saving a layout, you can choose whether or not to include **Main Window Position**, **Tool Window Positions**, **Docker Selected Tab**, and/or **Mixer Flags**. You can also use the **Last Focus** option to ensure that a particular view automatically is given focus whenever the Screen Set is loaded.

Windows Screen Sets will be examined in further detail in Section 9 of this User Guide.

9.4 The Marquee

Marquee is a term that refers to a technique in which you can use your mouse as in imaginary lasso, to round up a whole bunch of media items and select them without having to go through an otherwise long sequence of **Ctrl Click**. It can be especially useful when a project is made up of a large number of small items.

Here's how the REAPER Marquee works:

Action	Result
Right Click/ Drag	Marquee select items.
Shift Right Click/ Drag	Marquee select, add selected items to existing selection.
Ctrl Right Click Drag	Marquee select, toggling selected items state.

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10 Pitch and Time Manipulation

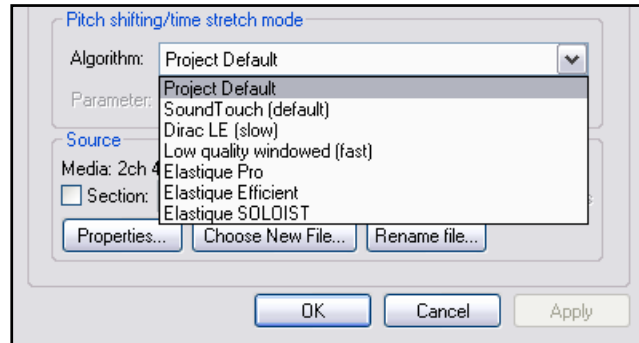
10.1 Changing Pitch for Individual Media Items

The pitch of any item can be changed from the **Media Item Properties** dialog box.

The pitch is measured in semitones. You can enter a number to raise or lower the pitch of any item by that number of semitones.

Notice that there is a drop down list that you can use to select your preferred Pitch shifting / Time stretching algorithm. The choices are:

- Project Default.
- Sound Touch.
- Dirac LE (better quality, more CPU intensive).
- Low quality windowed.
- Elastique Pro (best)
- Elastique Efficient (less resource intensive than Elastique Pro)
- Elastique SOLOIST (suitable for monophonic items)



If you choose one of the Elastique algorithms, you should also select a Parameter from the different options available for each of the three algorithms.

To open the **Media Item Properties** dialog box for any item, first select the item, then press **F2**. Note that the default algorithm is determined by your [Project Settings](#).

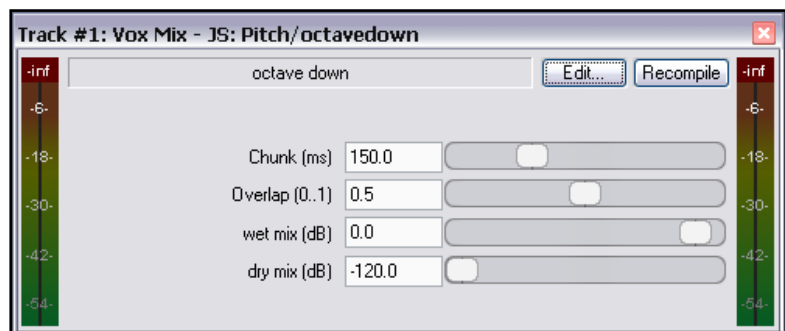
A number of keyboard shortcuts allow you to easily and quickly change the pitch of any selected item or group of items without needing to open the Media Item Properties box:

Keyboard Shortcut	Description
Shift 9	Move pitch down one semitone.
Shift 7	Move pitch down one cent.
Shift 0	Move pitch up one semitone.
Shift 8	Move pitch up one cent.

For more sophisticated and adventurous pitch shifting escapades you can try using one of the pitch manipulation plug-ins that are supplied with REAPER. Simply open the FX window for a track, click on **Add**, then in the filter list type *pitch* to display a list of what is available.

Shown right is the **Octavedown** plug-in. Other JS pitch shift plug-ins include *fft-ps*, *mdct-shift*, *octaveup*, *pitch2*, *pitchdown* and *superpitch*.

These are each suited to particular tasks, but the most powerful of the available pitch shift plug-ins is **ReaPitch**.



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10.2 Using ReaPitch

Simply insert the VST ReaPitch plug-in into a track's FX bin and you have a powerful pitch manipulation tool at your disposal.

For example, you can use ReaPitch to create vocal harmonies.

The first illustration (right) shows ReaPitch inserted into the FX chain for a vocal track. The Elastic Soloist algorithm has been selected, together with the Monophonic parameter. Notice that the pitch has been shifted down by 25 cents.

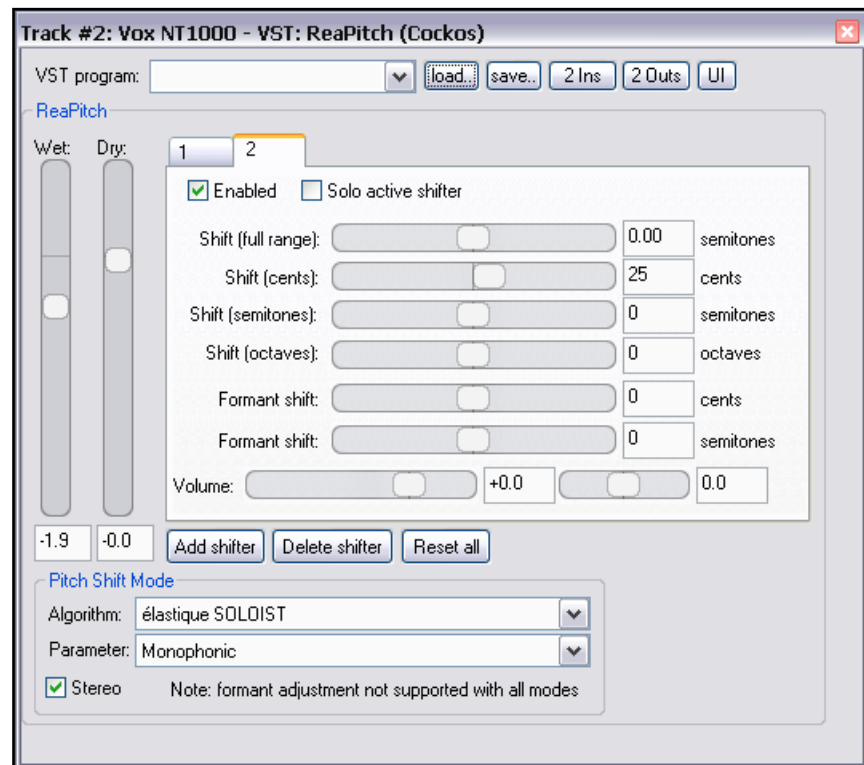
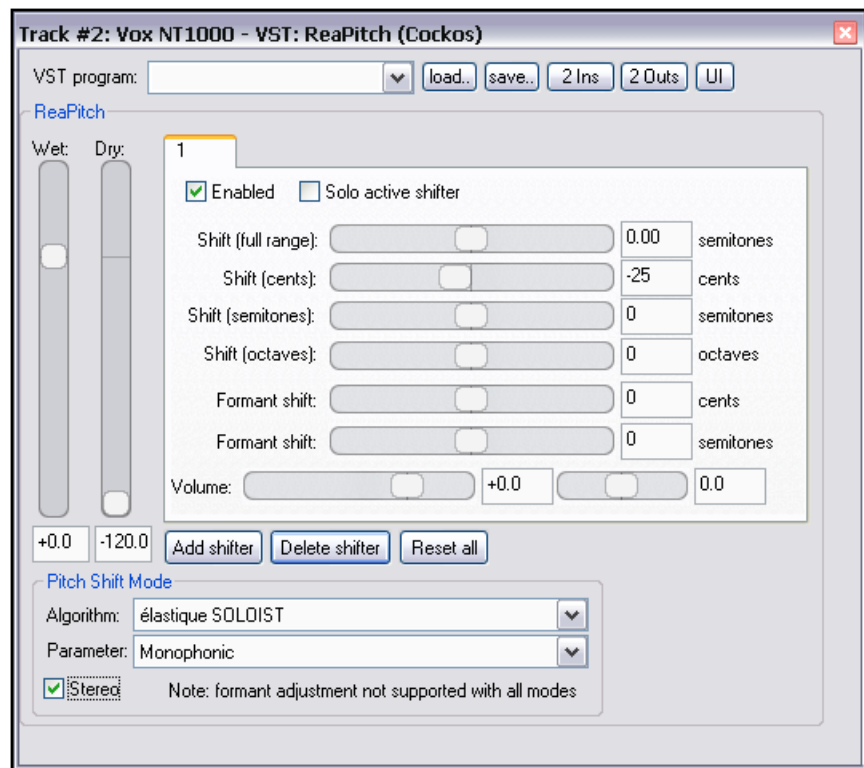
In the second illustration, you can see that we have added a second shifter, this time taking the pitch up by 25 cents, thus creating an extra harmony.

Notice also that in the second illustration we have adjusted the mix of the wet and dry signals to produce a more pleasing overall effect.

Pitch Shifting and Channel Splitting

If you intend to do a lot of work in this area, you should definitely take the time to get on top of REAPER's channel splitting capabilities. These are explained in some detail in the section [More REAPER Routing Examples](#) (and elsewhere). Look especially at the example headed [Channel Splitting and Pitch Shifting](#).

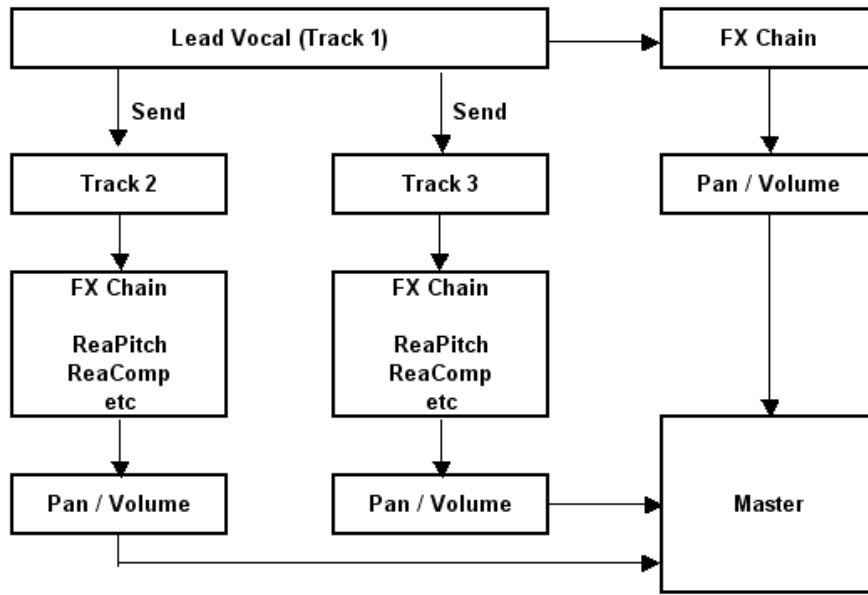
With channel splitting, you can, for example, not only create several vocal harmonies, but also apply different FX plug-ins or plug-in chains (such as Reverb or Delay) to each of your different harmonies.



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10.3 Using ReaPitch with Multiple Tracks

We've already looked at how REAPER can send audio streams from one track to another. Let's now have a look at how this feature might be used with ReaPitch.



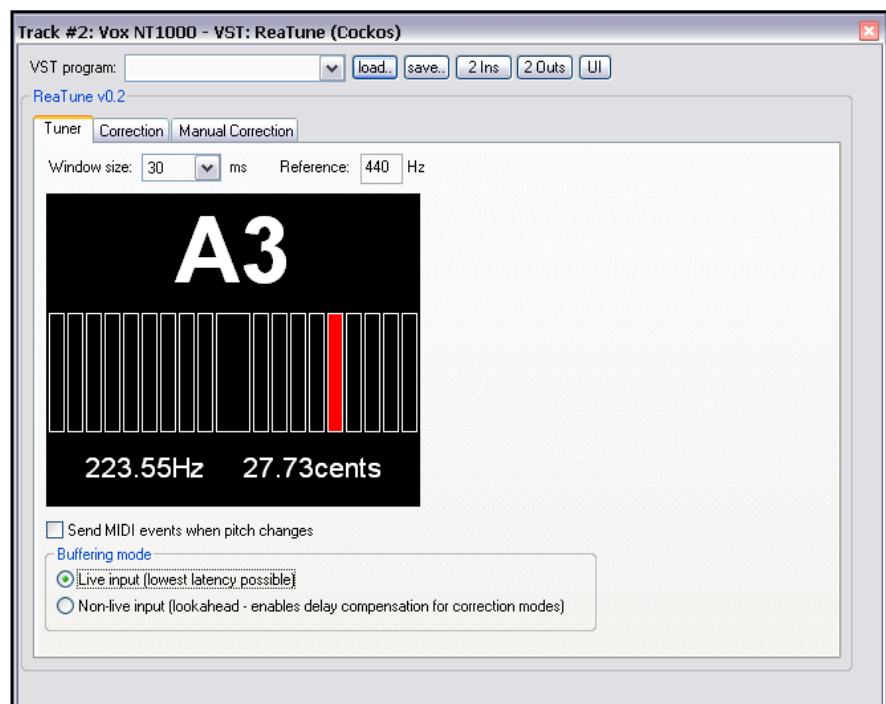
In the example shown on the left, sends are used to send a signal from a Lead Vocal Track to two other tracks.

Each of these other tracks has its own FX chain which includes ReaPitch, and of course the pan and volume faders for these tracks can be controlled independently of each other and of the lead vocal.

10.4 Instrument Tuning with ReaTune

ReaTune is a plug-in that can be used to help you correct the pitch on your recorded media items. In this respect it is most commonly used with vocal tracks.

However, it is definitely worth noting that ReaTune can also be used to help you to tune an instrument – see illustration on right.



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10.5 Pitch Correction with ReaTune

The plug-in **ReaTune** that is supplied with REAPER can be used for pitch correction. It can be used in either manual or automatic mode. In either mode, Elastic SOLOIST is a suitable algorithm to use.

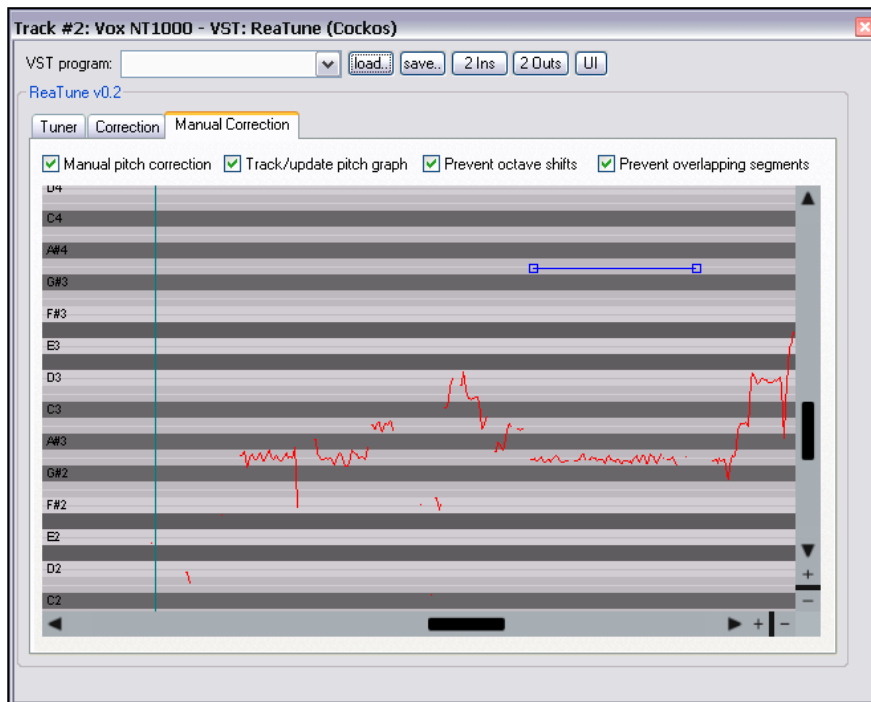
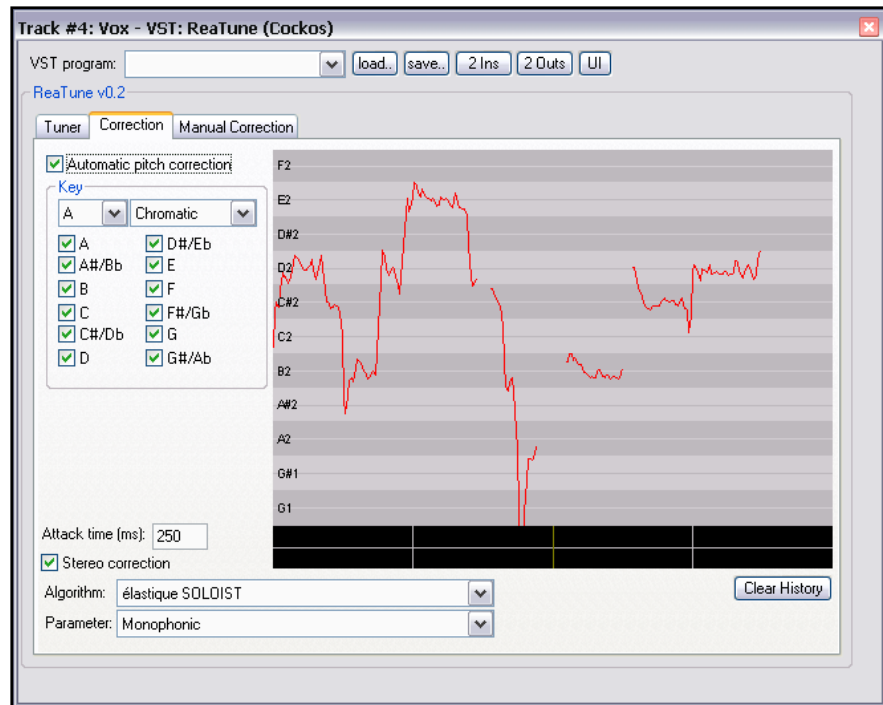
Automatic mode is illustrated right.

To apply it, first insert the **ReaTune** plug-in into a track's FX window.

You should then:

- Select the page headed **Correction**.
- Enable the **Automatic pitch correction** option.
- Select the required algorithm and parameter.
- Specify the correct key.

ReaTune will then do the rest for you!



Manual mode is illustrated left. Click and drag to mark your pitch corrections.

To apply it, first insert the **ReaTune** plug-in into a track's FX window.

You should then:

- Select the page headed **Manual Correction**.
- Enable the **Manual pitch correction** option, and other options as preferred.
- Use your mouse (click and drag) to draw in your corrections.

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10.6 Time Stretching

The **Media Item Properties** dialog box (**F2**) can also be used to stretch or shrink the time for an item.

To do this, adjust the **Playback Rate**. In the example shown (right), playback rate is increased by 2% and the option to **Preserve Pitch** has been selected.

To open the Item Properties dialog box for any item, first select the item, then press **F2**.

To make the same change for a number of items, do this:

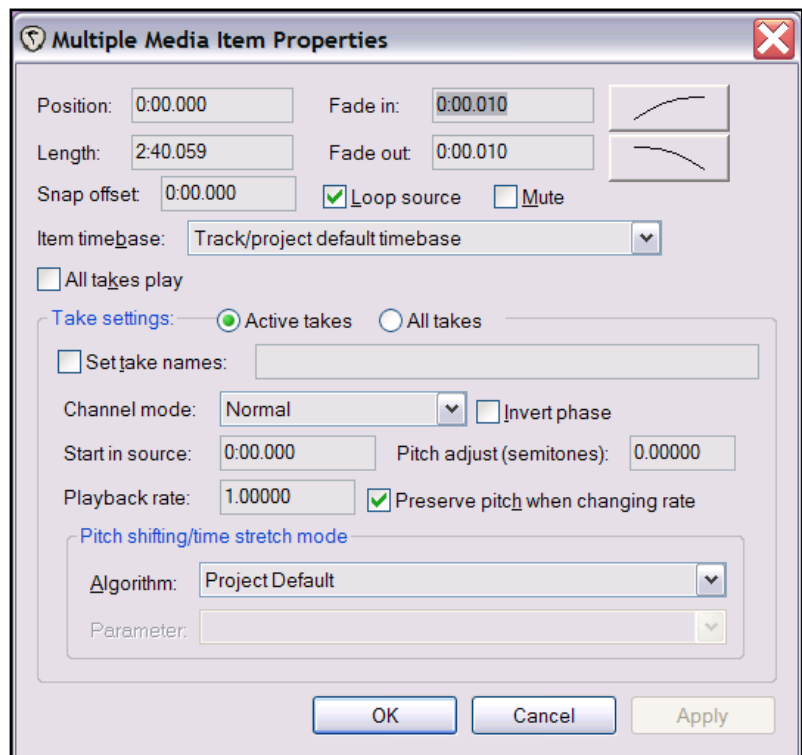
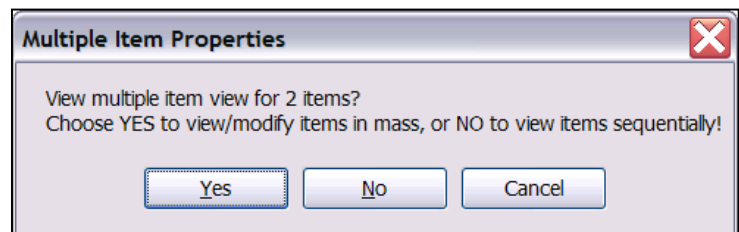
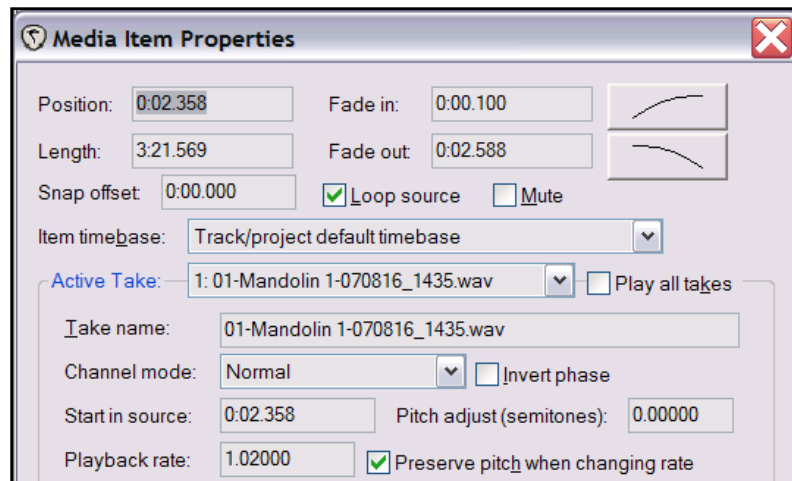
1. Select all of the required items.
2. Press **F2**.
3. When the **Multiple Item Properties** prompt appears (see right), choose **Yes**.
4. Make your changes.
5. Click on **OK**.

The Multiple Media Items Properties dialog box is shown here.

Notice that it contains many but not all of the options that you will find in the Item Properties dialog box.

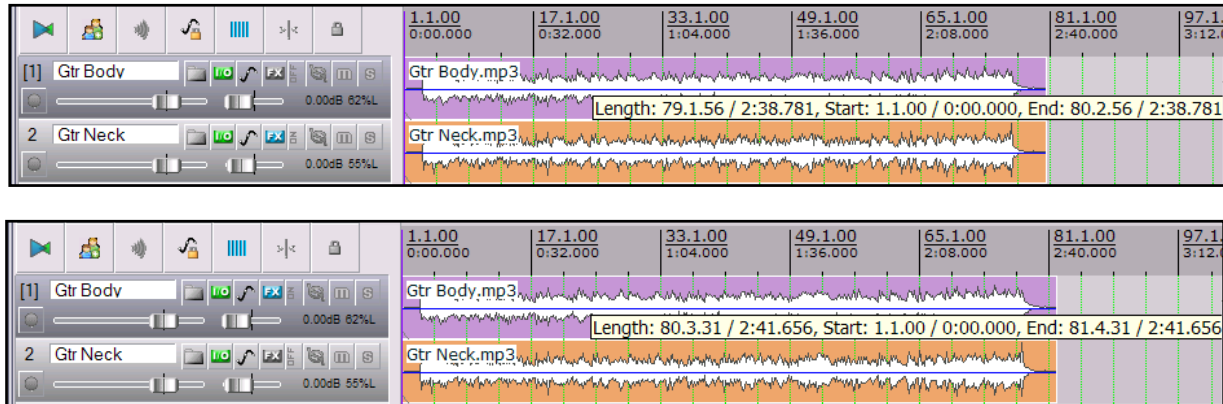
Another method that you can use to adjust the playback rate of any media item (or selected group of media items) is this:

1. Select all the required items.
2. Hover the mouse over the end of one of then items until it turns to a double-headed arrow, as you would for slip-editing. Holding down the **Alt** key, click and drag the mouse, left to increase playback rate, right to slow it down.
3. Release the mouse when finished.



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Notice that any changes that you specify to Pitch or Playback Rate will be displayed on the Media Item(s) in Track View.



10.7 Changing the Time Signature Marker

The default project Beats per Minute and Time Signature for any project are determined by the values assigned to these items in the **Project Settings**.

However, you can change these at any point in a song, as appropriate by inserting a Time Signature Marker. This changes the beat after the marker position.

To change the Time Signature Marker at any point:

1. Position the edit cursor at the required place in the song.
2. From the menu, choose the **Insert** command, then **Time Signature/Tempo Change Marker**
3. Specify your requirements in the dialog box (right). Available choices include **BPM**, whether to **Gradually transition tempo to next marker** and **Set Time Signature**.
4. Click **OK**.



Changes to the time signature marker will impact on the metronome and MIDI items but not, of course, on recorded audio items.

Tip: This process can be automated using the **Tempo Map Envelope** – see [Section 13 – REAPER Automation](#).

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11 The REAPER Mixer and Master

11.1 Introduction

Up until now, most of the emphasis has been on working in Track View. This is hardly surprising, as that is the area where you will find yourself spending most of your time (at least with audio) and doing most of your work. As your mix progresses, however, you will find that the REAPER Mixer begins to assume more importance. The contents of this section should help you to familiarise yourself thoroughly with the REAPER Mixer and its various features and capabilities. You will also learn more about how to get the best out of the REAPER Master.

11.2 Mixer Layouts

The commands on the Mixer's right click context menu offer you a great deal of flexibility as to how the mixer is displayed. Moreover, you can easily save and recall at will different mixer layouts. This can be a great timesaver, because the more you use REAPER, the more you will find yourselves settling on perhaps three or four different layouts that you prefer for use in different circumstances. This will depend mainly on two factors:

- **Number of Tracks:** your preferred mixer layout is likely to be different for a project with only three or four tracks from what it would be for a project with perhaps 20 or 30 tracks.
- **Project Stage:** the information that you would like to see in your Mixer may vary according, for example, to whether you are at the recording, early mixing, or final tweaking stage of your project.

Ctrl M toggles Mixer View open and closed. Your various mixer layout options are accessed by right-clicking over the background area of the mixer.

Command	Description
Show folders	Determines whether track folders are shown.
Show normal top level tracks	Determines whether tracks not in folders are shown.
Show Tracks that are in folders	Determines whether tracks in folders are shown.
Show Tracks that have receives	Determines whether tracks with receives are shown.
Group folders to the left	Places track folders to the left. This can be useful at times in bringing all your submix folders, but confusing at other times for separating folders from their child tracks.
Group tracks that have receives to the left	Places all tracks with receives to the left. This can be useful especially if the only tracks with receives are all buses.
Scroll view when tracks activated	Causes the view to be scrolled when tracks are activated.
Show multiple rows of tracks where size permits	Shows tracks displayed in up to three rows when tracks will not fit in one row and the mixer window has sufficient height.
Show maximum rows even where tracks would fit in less rows	Causes tracks to be displayed in as many rows as will fit in the track height, regardless of how few tracks there might be.
Show master controls on right	Moves the Master to the right of the mixer.
Show pan controls on top	Moves the pan controls to the top of each track.
Show FX inserts when size permits	Displays an FX bin above the track controls.
Show sends when size permits	Displays a Sends bin above the track controls.
Dock mixer in docker	Docks the mixer in the REAPER docker.

To help you understand how these options are applied, the table below and the illustrations that follow it represent three examples of possible mixer layouts.

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Option	Mixer 1	Mixer 2	Mixer 3
Show folders	●	●	●
Show normal top level tracks	●	●	●
Show Tracks that are in folders	●	●	●
Show Tracks that have receives	●	●	●
Group folders to the left	●	●	
Group tracks that have receives to the left			
Scroll view when tracks activated			
Show multiple rows of tracks where size permits	●	●	●
Show max rows even where tracks would fit in less			●
Show master controls on right		●	●
Show pan controls on top		●	●
Show FX inserts when size permits		●	●
Show sends when size permits		●	

Mixer 1



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Mixer 2



Mixer 3



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11.3 Modifying Track Layout Elements

You can use your mouse to adjust for any track or selection of tracks the relative height within the Mixer of the various elements, such as the FX bin, the Sends bin, and the Track Control area.

To do this, simply hover your mouse over the boundary between the two elements so that the mouse becomes a double-headed vertical arrow, then click and drag up or down. This action can be controlled by any of the following modifiers.

Action	Result
Click/Drag	Adjusts relative height of elements for the current track only.
Alt Click/Drag	Adjusts relative height of elements for all currently selected tracks.
Ctrl Click/Drag	Adjusts relative height of elements for all track.

Example



In the Mixer shown above, you can notice that:

- For Tracks 1, 5 and 6, there is insufficient room to display all of the track FX.
- For Track 6, there is also insufficient room to display all of the track sends,

Notice where the mouse is hovering – on Track 9, on the boundary between the Sends bin area and the Track Control area.

We now hold the **Ctrl** key while clicking and dragging down a little before releasing the mouse.

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Notice (above) that for all tracks the height of the Send and FX bin area has been made larger, whilst the height of the Track Control Panels has been reduced. However, we still cannot see all the FX for Track 5. We therefore hover the mouse where shown – on the boundary between the FX and Sends bins for that track, then click the mouse, hold and drag down a little before releasing the mouse button, as shown below.



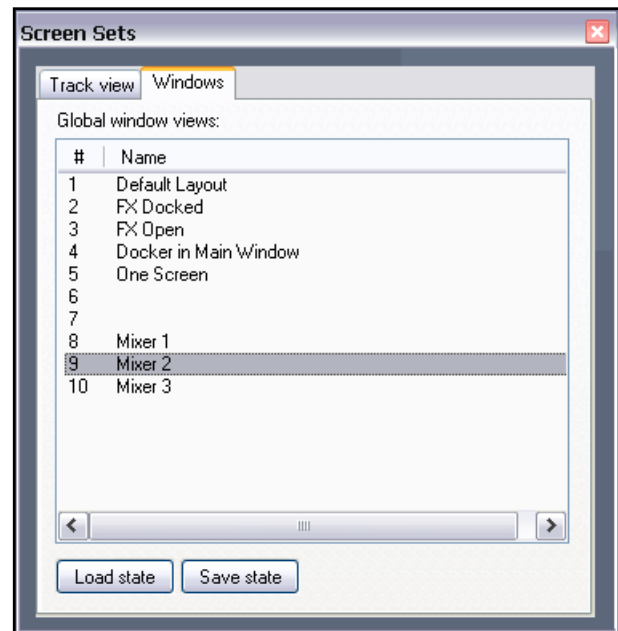
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11.4 Using Windows Screen Sets

Windows Screen Sets have already been discussed in Section 9. In addition, you can save your various preferred mixer layouts as Windows Screen Sets. This makes the layouts globally available to all projects. To do this:

- Display the Screen Sets window (**View, Screen Sets**) and select the **Windows** tab.
- Click on any available number, then **Save State**.
- Type a suitable name
- Select any or all of the other four items, but be sure to include including **Mixer Flags**.
- Press **Enter**.

Tip: If you give focus to the Mixer View immediately before saving your Screen Set and include the Mixer Flags and Last Focus items in your settings, then you will ensure that whenever that Screen Set is loaded the Mixer will have focus.

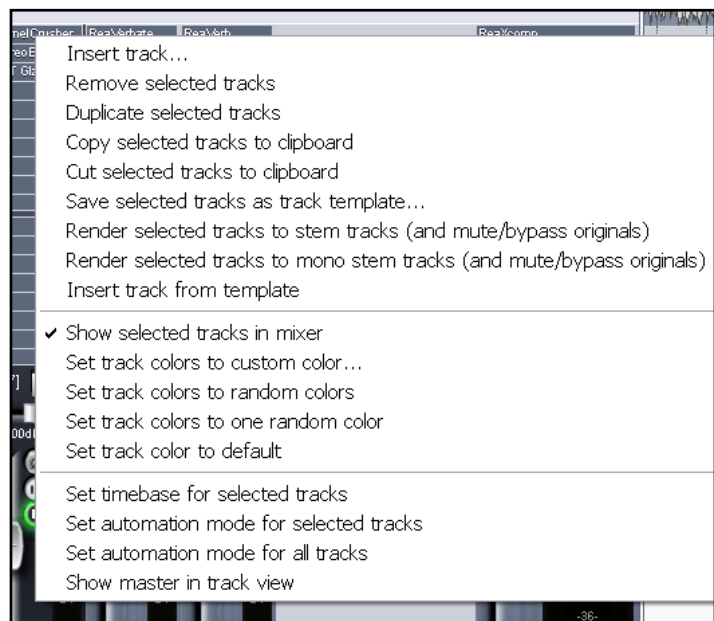


To retrieve a layout, simply double click on its name in the Screen Sets window. You can also, of course, assign shortcut keys to your various screen sets and use those.

11.5 Track Control Menus and Windows

By and large, the same functionality that is available in the track control panels of your track view is also available in the mixer. The main exception is that you cannot access a track's Envelopes window from the Mixer. These functions are covered in detail in Section 2 of this User Guide. For example:

- Right clicking over the background area or Track Number for any track panel in the mixer produces the track context menu (see right)
- Clicking on a track's I/O button displays the track's Routing Window. Right clicking on this button displays its routing menu.
- Clicking on a track's FX button displays the FX chain for that track. Right clicking on this button displays the Add FX window.
- Right clicking over a track's volume or pan fader causes the Volume Control or Pan Law window to be displayed.
- Similarly, the Record Arm, Record Monitoring and Select Record Mode buttons serve the same purposes as they do in Track View.



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11.6 Mixer Shortcuts

As well as all the functionality described above, the FX Bin and Sends Bin in mixer view (when visible) make available to you a few shortcuts of their own. These are described below:

FX Bin Mouse Shortcut	Description
Click on any displayed plug-in name	Opens and floats that plug-in's control window. This can be useful when you want to move swiftly from plug-in to plug-in on different tracks to tweak the various parameter settings.
Ctrl Click on any displayed plug-in name	Displays the FX chain and the control window for that plug-in.
Shift Click on any displayed plug-in name	Toggles bypass state for that plug-in.
Alt Click on any displayed plug-in name	Remove that plug-in from FX Chain.
Alt Click on track's FX Button	Remove all plug-ins from that track's FX Chain.
Ctrl Shift Click on displayed plug-in name	Toggles offline status of that plug-in.
Right click on any displayed plug-in name	Displays a context menu (see right) including: Add FX ... Add FX Chain ByPass Chain Rename FX Instance
Click in any vacant area of the FX Bin	Displays the Add FX window.
Right click on any vacant area of the FX Bin	Displays a context menu whose commands include Add FX, Add FX Chain, Show Effect Chain and Bypass Chain.
Drag and drop up or down	Change the order of plug-ins in the FX Chain.
Drag and drop FX to another track	Copy FX from one Chain to another (similar to Track View).

Sends Bin Mouse Shortcut	Description
Click on any displayed Send	Opens the Control window for that send.
Right Click on any displayed Send	Displays a context menu (right) including: Show routing window Go to send destination track
Click and drag on a Send's Control Knob	Raise or lower the send volume level.
Shift Click on any Send	Toggle that Send's Mute status on or off.
Alt Click on any Send	Deletes the send.
Ctrl Click on any Send	Opens entire routing window for that track.
Click in vacant area of Sends bin	Opens entire routing window for that track.
Drag and drop from one bin to another	Creates a send from first bin to second.
Hold Ctrl and drag and drop from one bin to another	Creates a send from first bin to second and opens control window for that send.
Drag and drop Send to another track	Create a copy of the send on that track.

Show send parameters	Click
Mute send	Shift+Click
Remove send	Alt+Click
Show track routing window	Ctrl+Click
Go to send destination track	

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11.7 Mixer Shortcut Key Assignments

By default, **Ctrl M** can be used as a shortcut key to open and close the Mixer view. In addition, most of the commands on the Mixer's right-click menu can be assigned keyboard shortcuts of your own. Any of the following actions can be assigned to your own shortcuts:

- Mixer: toggle docking in Docker
- Mixer: toggle tracks with receives grouping to left
- Mixer: toggle folder tracks grouping to left
- Mixer: toggle show normal top level tracks in mixer
- Mixer: toggle tracks with receives in mixer
- Mixer: toggle show tracks in folders in mixer
- Mixer: toggle show multiple rows when space
- Mixer: toggle show multiple rows even when space to fit tracks in less rows
- Mixer: toggle show master controls on right side
- Mixer: toggle show pan controls on top
- Mixer: toggle show sends if space available
- Mixer: toggle show FX inserts if space available
- Mixer: toggle show folder tracks in mixer
- Mixer: toggle scroll view when tracks activated

Keyboard shortcuts are assigned via the **Keyboard / Control** page of the **Options, Preferences** window. How to create and assign keyboard shortcuts is explained in several places in this User Guide, for example in [Section 2.8](#), [Section 4.6](#) and [Section 4.7](#).

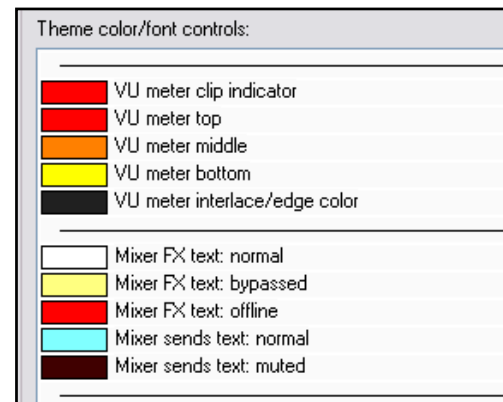
11.8 Mixer Colour Themes

The topic of [customising colours](#) for your various screen elements is covered in detail in Section 15 of this User Guide. Meanwhile, you might wish to note that the following mixer-specific items can be assigned your custom colours by displaying the **Options, Preferences** window and the selecting the **Colour Theme** settings page:

- Mixer FX text normal
- Mixer FX text bypassed
- Mixer FX text offline
- Mixer sends text normal
- Mixer sends text muted.

In addition, you can change the colour settings for your VU meters, and specify whether you want the display to be interlaced.

- VU meter clip indicator
- VU meter top
- VU meter middle
- VU meter bottom
- VU meter interlace/edge colour



Click on any colour shown that you wish to change to open the Colours window. Don't forget to Apply your changes when finished.

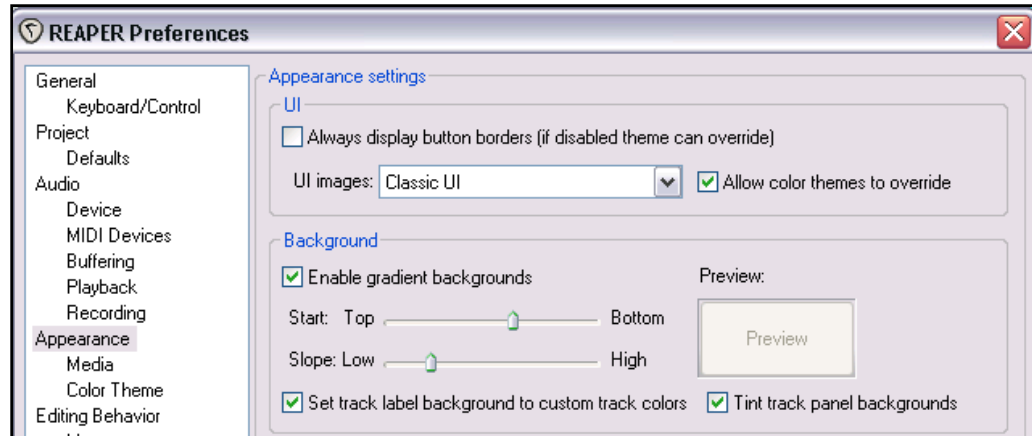
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11.9 Mixer Appearance Settings

Tucked away under **Options, Preferences, Appearance** are a couple of options that you can use to customise your mixer appearance by the use of colour coding.

Shown right, the two options to **Set track label background to custom track colour** and **Tint track panel backgrounds** have both been selected.

An example of how these options might cause your mixer to be displayed is shown below. Although not obvious at first sight, the various shades of grey for the various track panels are in fact different colours that have been selected for different instruments or groups of instruments.



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11.10 Master Track Options and Settings

The Master Track Control Strip in the mixer includes most of the functions that are found in the Master Track when it is displayed in Track View. Again, the main exception is that the Envelopes window cannot be opened directly from the Mixer.

Examples of the available functions and features are:

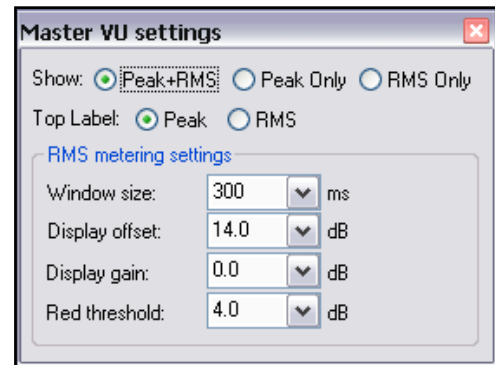
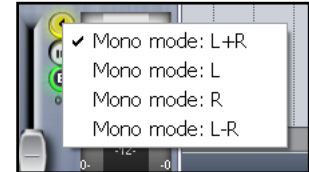
- Left click on the Output button to toggle between Stereo and Mono modes.
- Right click on the Output button to select any one of four available Mono options (see right).
- Left click on the FX button to display the FX Chain for the Master.
- Right click on the FX button to open the Add FX window.
- If the FX Bin for the Master is displayed (as in the examples Mixer 2 and Mixer 3 that we looked at earlier), then you can use all and any of the [Mixer Shortcuts](#) detailed in section 6.5.
- Right click over the VU area to display the various settings that you can use to control what is displayed in the VU and how it is displayed (see right). Available options include:

Whether to show Peak plus RMS, or one or the other only.

Window size.

Display offset level and Display gain level

Red threshold level.



11.11 Master Hardware Outputs

Output from the Master can be directed to one or more of your available hardware outputs. The easiest way to select multiple hardware outputs is probably via the Routing Matrix. In addition to this, there are some very clever features available in the Master which will help you to manage and control your output, especially if you are using multiple hardware outputs.

The I/O button merits a special mention for the way it can be used to set up and manage your hardware output or outputs.

- Right click on the I/O button to display a menu of all available hardware output options. These can be toggled on and off in any permutation that you require.
- Left Click on the I/O button to display the Master Track Outputs window. This can be used to control the levels and panning of the signals that are being sent to the various output devices.



Notice (above) that for each output you can independently control any or all of the following:

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- Toggle Mute on/off.
- Toggle phase invert.
- Set Volume level.
- Set panning level.
- Select channels. This will be explained in the section immediately following this one.

11.12 Master Track Channels

The topic of routing and channel splitting is an area which is about as big as it gets. It is a topic that recurs throughout this user guide. The concept itself starts as a relatively simple one, but from those simple beginnings it can grow into something as complex and as complicated as you like.

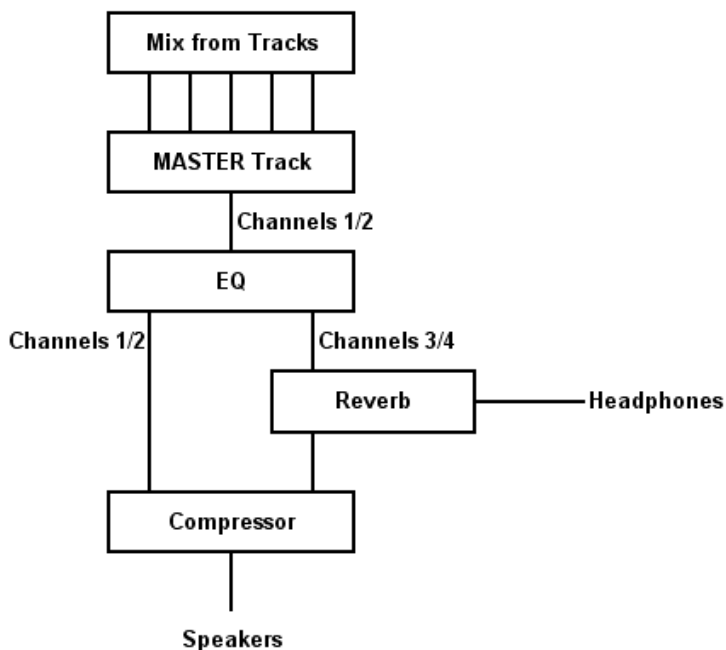
At its simplest, it means this. You can use channels to send two copies of the same signal to two different places. Then it starts to get interesting. That's because, for example, you can do separate things to each channel along the route and then join them up again.

Slow down! If that's already starting to make your head spin, let's work through a relatively simple example. The example itself may or may not be something that you'll ever want to do, but that's not the point. The point is that it will help you to understand what channel splitting is about and how to do it.

Let's take an example of using multiple channels (two stereo pairs in fact) for our Master. We're going to use this to feed some reverb into our signal chain, then send the reverb (and only the reverb) out to our headphones (to enable us to assess it), while sending the overall final mix to our speakers.

In order to work through this example, you will need a sound card with at least four audio outputs. If your sound card provides only one pair of outputs, you can instead try [some of the examples included in Section 17](#) of this User Guide.

Example



The diagram on the left illustrates what we are going to achieve. It assumes that our audio signal flows from top to bottom and from left to right.

First we will create the necessary extra Channels for the Master Track.

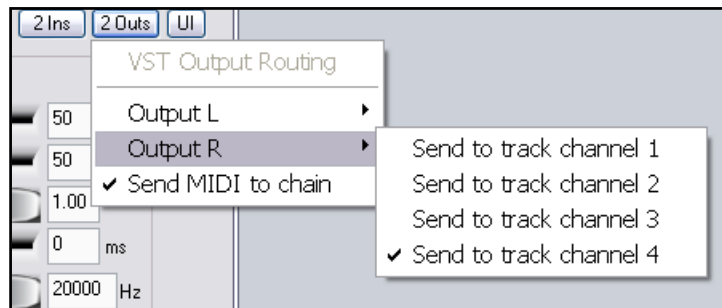
The audio coming into our Master from the mix will be split between Channels 1/2 and Channels 3/4.

The signal that is passed to Channels 3/4 will be fed through a Reverb plug-in then directly out to our headphones. It will also be passed back into a Compressor plug-in, where it will be mixed back into the original incoming signal.

The final mix will then be fed to the speakers.

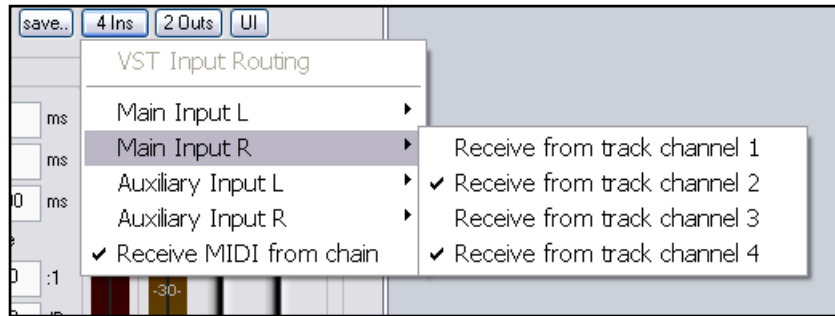
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1. Open the file **All Through the Night.rpp** and save it as **All Through the Night MASTER.RPP**.
2. Pan the two guitar tracks roughly 40% left and 40% right respectively. Pan the Bouzouki about 15% left, the Vox around 10% right. Quickly adjust the volume levels for each track to suit, especially to avoid clipping in the Master. Save the file.
3. If this was one of your projects, then of course you would want to do more work on individual tracks to get them just right. This might include the use of EQ, some compression, perhaps a touch of delay, and so on. For the purpose of this example, we can just imagine that this has been done.
4. Create a layout for your Mixer that includes the option to **Show FX Inserts**.
5. Make sure that your Speakers and Headphones are each connected to separate pairs of your sound card outputs.
6. Right click over the **I/O** button and make sure that output is directed both to your speakers and to your headphone amp.
7. To create the required channels, click on the **I/O** button for the **Master Track** and set the number of channels to 4 (as shown, right).
8. Assign the output of channels 3/4 to your headphones and channels 1/2 to your speakers. Your settings should appear similar, but of course not identical, to those shown on the right.
9. Play the song. At present, it should be heard over the speakers, but your headphones should still be silent.
10. Now click on the first row of the Master's FX Bin, add the plug-in **ReaEQ** and, for the purpose of this exercise, add a 2 dB gain on Band 2, a 1 dB drop on Band 3, and a 1dB gain on Band 4.
11. Now click on the second row of the Master's FX bin and add **ReaVerbate**. Leave the parameters at their default settings, but adjust the outputs from this plug-in so that they are directed left and right respectively to channels 3 and 4 only. The assignment for the right output is illustrated (above).
12. Now play the song. The playback through the speakers will include the effects of your **ReaEQ** settings but not the **ReaVerbate**. In contrast, if you listen through the headphones, you will hear only the reverb.
13. Adjust the reverb settings until you are satisfied with the reverb effect.
14. Now click on the third row of the Master FX bin and add **ReaComp**. Adjust the Input Settings for this plug-in so that Channels 1 and 3 are the Main Input for the left, and channels 2 and 4 are the Main Input for the right. The assignment of inputs for the right is illustrated below.



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15. Now play the song. You can adjust the amount of reverb that is fed into the mix by adjusting the vertical **Wet** and **Dry** faders in the **ReaVerbate** window. You can also adjust the Threshold (vertical fader on the left) and ratio settings for **ReaComp** if you wish.



16. Your speakers will now play the output signal from your Master Track's FX chain, including the reverb mixed in. Your headphones will still play only the direct output of the **ReaVerbate** plug-in.
17. Save this file.

11.13 Avoiding Channel Congestion

You need to be aware when you are using multiple channels for the Master Track that any signal routed along any channels between tracks will also be output to the Master.

For example, you might be using Channels 3/4 elsewhere in your project for the purpose of audio ducking (an [example of audio ducking](#) is included in section 12). In that case, if you also used Channels 3/4 for the purpose outlined in the above example, then the signal sent to your audio ducking compressor would also be added to the signal being fed to your reverb plug-in, over and above the main mix.

This channel congestion can be avoided simply by reserving for the Master a pair or pairs of channels not used elsewhere in the project – in this example, you might choose to use Channels 5/6 or Channels 11/12. Since you have up to 64 channels available to you, this should not normally present you with any problem.

Alternatively, there could be occasions when you might want to use this aspect of REAPER's channel routing to your advantage. [An example of this](#) is included in Section 17, under the heading *Double Ducking*.

11.14 Reset VU Meter Peaks

Notice that during playback, your VU meters in both track view and mixer view will display the peak level recorded for each individual track (see right – in this example, the track has peaked at -11.6).

To reset the peak reading for any individual track, click your mouse over the area where the peak value is displayed.

To reset the peak reading for all tracks, hold the Ctrl key while you click your mouse over the area where the peak value is displayed in any one track.

You can also if you wish enable the option under **Options, Preferences, Appearance** to **Reset meter peak indicators on play/seek**.



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12 The REAPER MIDI Editor

This section has been largely adapted and updated from a collection of material put originally together on the Cockos REAPER Wiki by **Jason Brian Merrill**. For more information, and for some great tips and tutorials, visit:

http://www.cockos.com/wiki/index.php/MIDI_Editor

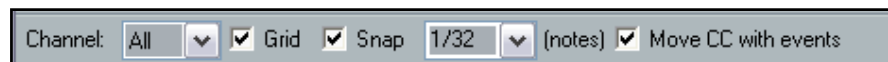
By default, REAPER's internal MIDI Editor is accessed by double-clicking on a MIDI Item, or by right-clicking on a MIDI Item and selecting **Open Items with built-in MIDI editor**, or by using the keyboard shortcut **Ctrl Alt E**.

The MIDI Editor can be used to create and edit MIDI Notes, Channel Information and Control Change (CC) Messages. The pages that follow offer a detailed descriptive explanation of the MIDI Editor's capabilities, and are included largely for reference. They assume that you already have a basic grasp of MIDI concepts and need primarily how to apply those concepts within REAPER. Later in this chapter you will be able to work through a simple example.

12.1 MIDI Editor Controls

From left to right these are:

Channel Box



The Channels filter controls which MIDI Channels (or all) are displayed in the MIDI Editor. If set to a particular channel, new MIDI events are added to that channel (otherwise new MIDI events will be added on channel 1).

Grid/Snaps/Notes

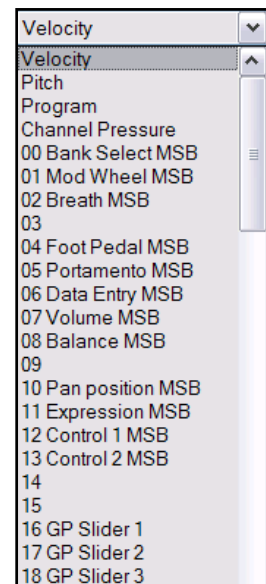
- The Grid check box enables/disables the Grid that is displayed in the MIDI Editor.
- The Snap check box enables or disables the "Snap to Grid" function within the MIDI Editor.
- The Grid Selection (notes) combo box allows you to select the Grid Size for the MIDI Editor. Note that the units is *Notes*, and that you can select from any of the values listed – 1/128, 1/64, 1/32, 1/16, 1/8, 1/4, 1/2, 1, 2 or 4..

Move CC with events

The *Move CC with events* check box enables controls whether CC events move with note events. When this check box is selected, moving any notes will result in the CC events that overlap in time (and on the same channel) with the selected notes moving as well.

Midi CC lane selection menu

Shown on the right, the CC control lane menu selects which midi CC (continuous controller) is to be controlled by the bottom lane. You can choose from all standard midi CCs as well as event velocity, pitch, program change, and channel pressure (aftertouch).



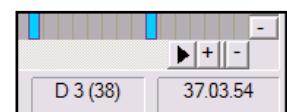
Transport

Shown right, the MIDI Editor Transport controls replicate the functions of the Main Transport. They are directly tied into the main transport controls, if the option to **Sync Editor Transport to Main Transport** is enabled (via the MIDI Editor **Options** menu)



Status Box

The MIDI Editor Status Window is located near the lower right hand corner of the MIDI Editor Window. It displays the note name and/or value (including CC), and the current Timeline position under the cursor.



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End Marker

The End marker defines the end of a particular midi sequence/loop.

12.2 The MIDI Editor Menus

The File Menu

Export to MIDI file

Exports active MIDI track to a file. MIDI events are normally stored in the Project file itself.

Close Editor

Closes the REAPER MIDI editor, and returns you to the main REAPER window.

The Edit Menu

Undo, Redo, Copy Events, Cut Events, Paste, Select All Events, Delete Events

These features work exactly as described on all selected MIDI notes.

Insert note at mouse cursor

A very quick way to insert notes (using the Insert key). Inserts new notes (according to the current Snap values) wherever your mouse is hovering.

Insert note at edit cursor

Similar to Insert Note at Mouse Cursor (using the I key), but positions new notes at the Edit Cursor.

Split notes

Splits selected notes (using the S key). If no notes are currently selected, all notes currently under the Edit Cursor are split.

Split note under mouse cursor

Splits any note currently located under the mouse cursor (based on snap settings). Disabling Snap allows you to make very accurate splits:

Quantize Events

Quantize selected events using last settings

Unquantize selected events

Freeze quantization for selected events

These commands as a group are used to quantize existing data. See the [Quantize](#) section and the [MIDI Toolbox](#) section for more information about this feature.

Remove selected duplicate notes

Removes duplicate notes from selection.

Set selected note ends to start of next note

Adjusts the end point of all notes in selected range

Reverse

Repositions selected MIDI events so they're reversed in relation to each other from their original positions.

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The Options Menu

Dock window

Positions the midi editor inside the Docker.

Sync editor transport to project transport

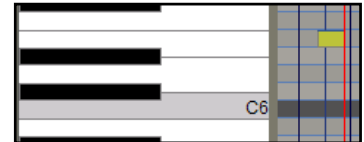
Synchronizes the transport of the MIDI Editor to REAPER's main Timeline. If you want to preview a single pattern, uncheck this option.

Preview notes on add/edit

This option is great for previewing single notes as you enter them. With this option enabled, REAPER plays whatever VSTi or MIDI instrument is assigned to that track through the FX box or hardware routing (providing monitoring is on).

Single click inserts/removes notes

Toggles on and off the use of a single mouse click to insert or remove a note.

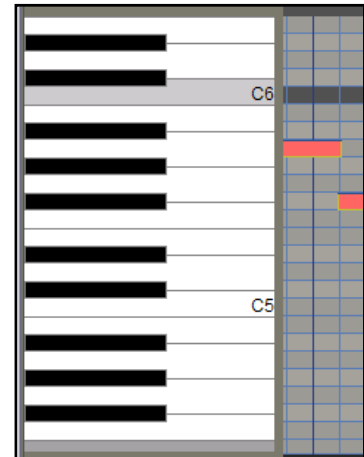


Use F1-F12 as step sequencer

When enabled, the function keys (F1 - F12) can be used to enter notes. These keys are mapped to the 12 Semitones of an Octave, with F1 having the lowest pitch and F12 having the highest pitch.

The starting pitch for F1 is determined by the location of the highlight bar. In the example shown, the starting pitch for F1 is C6. F5 has been pressed, creating an E note. By using the NumPad keys to move the position of the highlight bar and Edit Cursor, and the Function keys to enter notes, complete arrangements can be quickly created using the Keyboard alone.

Normally this mode will also advance the cursor according to the snap settings. You can bypass this and not advance the cursor by holding 'Shift' while pressing the function key.



The View Menu

Mode: piano roll

Displays a standard, white/black piano key view.

Mode: named notes

Replaces the Piano Roll view with note names. Note: Only works when using a VSTi that reports note names, such as Fxpansion's BFD.

Check the Reaper forum to see if a note namer plug-in have been posted for the VSTi you want to use. For example there are EZDrummer note namers available.

Mode: event list

Displays the event list. These three modes are discussed [in more detail later](#).

Show velocity handles on events

This option tells REAPER to display a velocity control on each MIDI event. Useful for quickly comparing and adjusting event velocities.

Show note names on events

This option tells REAPER to display the note name on each MIDI event.

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Show note times relative to project

Displays note times relative to project rather than as absolute.

12.3 Note Creating and Editing

Overview

The MIDI Editor uses a Piano Roll interface to display and edit MIDI information. Notes are displayed vertically according to their corresponding value on a Piano Keyboard, and horizontally according to the duration of each note and their location within the MIDI Item or the Timeline.

Preview Keyboard

The Preview Keyboard at the left of the screen (shown here, right) provides a visual representation of the value of the notes on the Piano Roll, and allows you to audition a note without having to enter or edit it first. Clicking a key on the Preview Keyboard will send a MIDI note of the corresponding value to the MIDI Instrument that is connected to the Track.

The Preview Keyboard is velocity sensitive. Clicking on the far left of a key will generate a soft note, while clicking on the far right of a key will generate a loud note.

Entering / Editing Notes

MIDI notes can be recorded as part of a performance or imported from an existing MIDI file, or they can manually entered using the MIDI Editor. This section describes the various methods for creating and editing notes by using the MIDI editor.

Using the Mouse:

Notes can be entered by dragging your mouse from left to right across the Piano Roll. The duration of the note will increase as you drag the Note. If Snap is enabled, the duration will Snap to the nearest Grid Line (depending on the strength of your Snap settings).

Notes can also be entered by double-clicking on the Piano Roll (in a space not already occupied by another note). In this case, the duration of the note is determined by the value of the Grid Setting. As of the 1.7x releases, you can also move the note up and down whilst entering it.

Notes can be deleted by double-clicking on the Note.

The duration of an existing note can be altered by dragging the edge of the note. While holding it, you can drag the note out, move it up and down, etc. Then you can let go and double click notes in according to the snap setting.

Notes can be moved by dragging in any direction. Dragging left or right will change the location of the note in the Timeline, while dragging up or down will change the note value.

Right-Click Menu

Insert note at mouse cursor

A very quick way to insert notes. It will insert notes according to the current snap values wherever your mouse floats over. Remember to use INSERT key otherwise you will have to move your mouse cursor!

Insert note at edit cursor

Similar to previous, but wherever the edit cursor is.

Copy/Cut/Paste/Select All/Delete/

These are standard Windows editing commands which perform standard Windows functions.

Insert note at mouse cursor	INSERT
Insert note at edit cursor	I
Copy notes	Ctrl+C
Cut notes	Ctrl+X
Paste	Ctrl+V
Select all notes	Ctrl+A
Delete notes	DELETE
Split notes	S
Split notes under mouse cursor	Shift+S
Mute notes	Alt+M
Note properties...	Ctrl+F2
Note channel	▶

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Split notes

Notes can be split at the Edit Cursor by selecting **Split notes (S)** from the right-click menu. All notes that are under the Edit Cursor will be split.

Split notes under mouse cursor

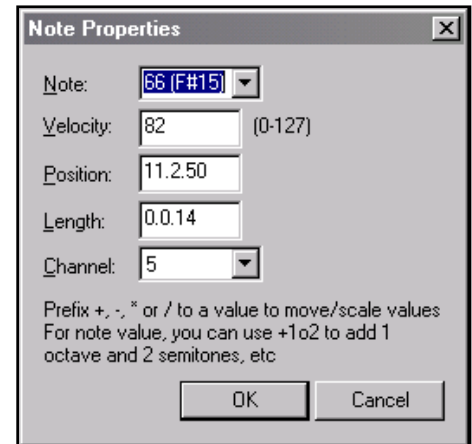
Notes can be split at the location of the Mouse Cursor by selecting **Split notes under mouse cursor (Shift S)** from the right-click menu.

Mute notes

Mutes according to context the current note selection or the note under the mouse cursor. To make a selection, use the right click-hold-drag technique to marquee (or lasso) the selection.

Note properties

This gives a way to alter the various values attributed to a midi note by entering the values into text boxes. You can change the note pitch, velocity, position, length and/or channel.



Note channel (1-16)

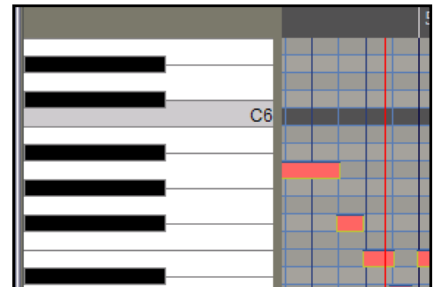
For example, choosing channel 8 will ensure that a note will only show up under channel 8 -- and will send that note to the vsti or midi instruments channel 8. It colours the note differently.

Using the Keyboard

Notes can be entered at the position of the Edit Cursor (the vertical line in the picture, shown below right) by using the Keyboard Shortcut **I**. The duration of the note will be determined by the value of the Grid Setting. The effect of this is shown in the two illustrations (right), before and after.

The Edit Cursor position on the Timeline is adjusted by using the Keyboard Shortcuts **NumPad 4** (back) and **NumPad 6** (forward).

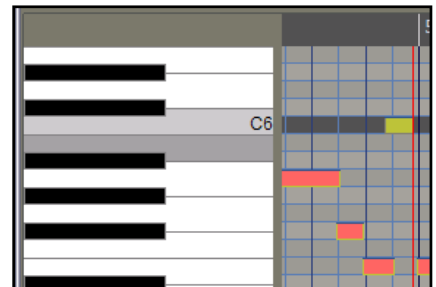
The note value is set by moving the highlight bar using **NumPad 8** (higher note) and **NumPad 2** (lower note) to select the note on the Piano Roll. The note will be created at the point where the highlight bar and the Edit Cursor cross.



Use F1-F12 as step sequencer:

When **Use F1-F12 as step sequencer** is selected, the Function keys F1 through F12 can be used to enter notes. The Function keys are mapped to the 12 Semitones of an Octave, with F1 having the lowest pitch and F12 having the highest pitch.

The starting pitch for F1 is determined by the location of the highlight bar. For example, if the starting pitch for F1 is C6 and F5 is pressed in sequence, this will create an E note. By using the NumPad keys to move the position of the highlight bar and Edit Cursor, and the Function keys to enter notes, complete arrangements can be quickly created using the Keyboard alone.



Normally this mode will also advance the cursor according to the snap settings. You can bypass this though and not advance the cursor by holding "shift" and pressing the Function key you want.

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Note Properties:

The Note Properties window can be accessed by selecting a Note, then selecting Note Properties (**Ctrl F2**) from the right-click menu.

The Note Properties window displays and allows you to edit the current Note Value, Velocity, Timeline Position, Length, and MIDI Channel of the selected Note.

Selecting / Editing multiple Notes:

Multiple notes can be selected by holding down the Ctrl or Shift keys while selecting notes with the mouse, by drawing a Marquee (Right-click+Drag) around a group of notes, or by using Select All (**Ctrl A**).

The value of all selected notes can be adjusted by dragging one of the selected notes.

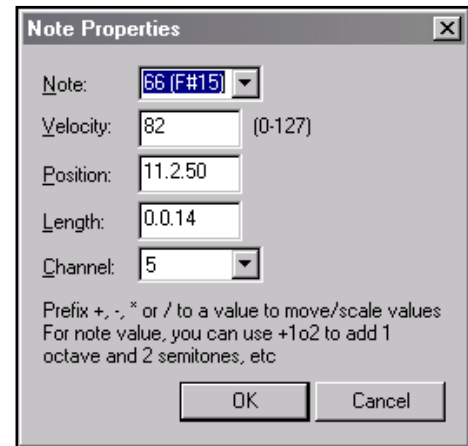
The duration of all selected notes can be adjusted by dragging the edge of one on the selected notes.

The note velocity of all selected notes can be adjusted by dragging the Velocity handle (when active) of one of the selected notes.

The default Velocity value for notes created in the MIDI Editor is taken from the last selected event - e.g. if the Velocity of the last selected event was 70, then the Velocity value for the next created note will be 70.

Scaling Notes

One very cool feature of the REAPER midi editor is to be able to move notes by scale! Simply select all the notes you want to scale by holding alt and left click dragging over the notes you want. Then after those notes are selected, simply hold down **Ctrl** and drag the edge out.



12.4 Control Channel Editing

MIDI Data Control Channel (CC) messages can be recorded during live performance, and edited or manually entered using the CC lane in the MIDI Editor.

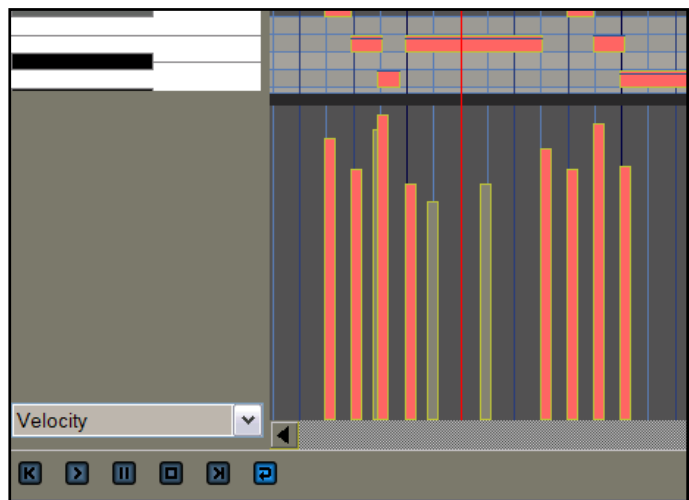
The CC Lane appears at the bottom of the MIDI Editor. Data is displayed horizontally according to its position on the Timeline, and vertically according to the value of the data.

The majority of CC data has a value of 0 at the bottom of the CC Lane, and 127 at the top of the CC Lane. The example (right) shows Velocity. Exceptions to this rule are Pitch, Pan and Pan Position, which are displayed as positive or negative variations from a centre line.

The information displayed in the CC Lane is selected from the drop-down list at the left of the screen.

CC Data is entered or edited by dragging the mouse to the required value.

- Hold down **Shift** while dragging to adjust a range of values (e.g. to draw a straight line).
- Hold down **Ctrl** while dragging to make fine adjustments.
- **Right Click** to delete values altogether.



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12.5 Control Change Messages

The role of control change messages is to bring about a change in the status of a MIDI parameter. If you are using an actual MIDI device, these messages can be used to physically control the foot pedals, volume sliders, modulation wheels, and other knobs and faders found on electronic instruments. Within REAPER, control change messages can simulate this effect when playing back your MIDI data through a software synthesizer.

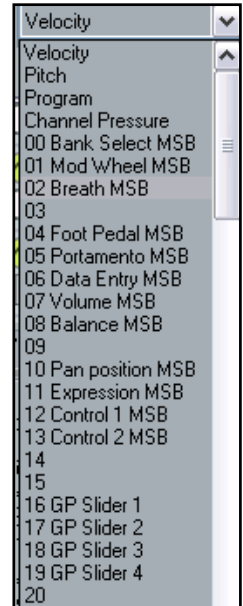
Controller data is used for various purposes. The different controller data streams are numbered from 0 to 127. Some of these controller numbers are industry standard. For example, controller 7 is generally used to control volume and controller 10 for panning.

A control change message has two parts. The first is the control change number, which determines which parameter is to be set. The second is the desired value for that parameter. For example, first, you might send a CC #7 message to specify that you want to adjust volume. Next, you send a value that sets the actual volume level required.

A control change message can act as either an *override* (setting the parameter to the exact value specified), or an *offset* (adjusting the parameter up or down by the amount specified).

MSB and LSB

MSB and LSB stand for *Most Significant Byte* and *Least Significant Byte* respectively. MSB control change messages typically act as coarse controls, while LSB messages generally allow fine adjustments. Some control change messages have both MSB and LSB versions. Most MIDI devices that contain sounds/patches respond to both Bank Select MSB and LSB control change messages. Some of the cc parameters are listed below. Don't worry if you don't understand them all. You should consult your MIDI device's documentation for more details.



Parameter	Description
Velocity	The measure of the speed with which a key on a keyboard is pressed.
Bank Select MSB Bank Select LSB	Many MIDI devices offer a total of more than 128 instruments, in which case these instruments are grouped into banks. Thus, depending on the device, a full program change message might consist of five parts – cc #0 (Bank Select), followed by the Sound Bank MSB value, then cc #32 (Bank Select LSB) followed by the Sound Bank LSB value, then finally the Program Change number. Program change numbers are discussed in more detail in the section immediately following this one.
Mod Wheel	This can add vibrato or other changes to a sound.
Breath	Varies from 0 (no force) up to 127 (high force).
Portamento	Determines the smoothness of the glide from note to note
Balance	Typically used to adjust the volume of stereo parts without affecting the panning.
Expression	Used to create relative volume changes.
Sound Timbre	The property of a sound that gives it its unique “colour”.
Sound Release	Determines how long it takes for a sound to fade out.
Sound Attack	Controls how long it takes for a sound to fade in.
Sound Brightness	This adjusts a sound's filter cutoff, allowing you to create filter “sweeps”.

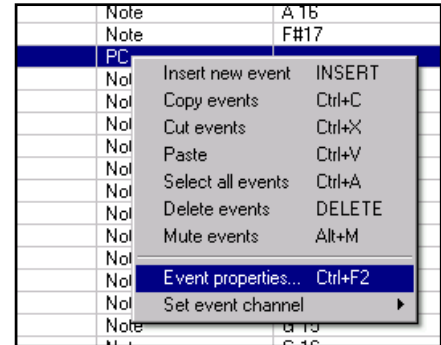
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12.6 General MIDI Program Patches



One of the parameters that you can select when using the Control Channel for editing in Piano Roll View is **Program**. These changes can also be inserted and/or edited in **Event List** view. Right-click over an existing event in Event View and choose **Event Properties** to display the Event Properties dialog box. Alternatively, to add a

new event, right-click at the required place and choose **Insert New Event**.



For **Program** events, each number between 1 and 127 represents a specific instrument. A few minutes spent with Google will yield a mine load of information. Meanwhile, here are some examples of standard General MIDI patches that you might find useful if your synthesizer supports them.

Pianos		Bass		Pipe	
1	Acoustic Grand	33	Acoustic Bass	73	Piccolo
2	Bright Acoustic	34	Electric Bass	74	Flute
3	Electric Grand	36	Fretless Bass	76	Pan Flute
4	Honky Tonk	Solo Strings		80	Ocarina
5	Electric Piano	41	Violin	Synth Lead	
7	Harpsichord	43	Cello	81	Square
8	Clavinet	45	Tremolo Strings	82	Sawtooth
Chromatic Percussion		48	Timpani	86	Voice
10	Glockenspiel	Ensemble		Synth Pad	
11	Music Box	49	String Ensemble	89	New Age
12	Vibraphone	51	Synth Strings	90	Warm
13	Marimba	53	Choir Aaahs	92	Choir
15	Tubular Bells	Brass		96	Sweep
16	Dulcimer	57	Trumpet	Synth Effects	
Organs		58	Trombone	97	Rain
19	Rock Organ	59	Tuba	104	Sci Fi
21	Reed Organ	61	French Horn	Ethnic	
22	Accordion	Reed		105	Sitar
23	Harmonica	65	Soprano Sax	106	Banjo
Guitars		66	Alto Sax	Percussive	
25	Nylon String	67	Tenor Sax	115	Steel Drums
26	Steel String	68	Baritone Sax	116	Woodblock
28	Electric Clean	69	Oboe	117	Taiko Drum
30	Overdriven Guitar	71	Bassoon	118	Melodic Tom
31	Distortion Guitar	72	Clarinet	119	Synth Drum

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12.7 MIDI Channels

A MIDI Item can contain data from one or more MIDI channels (up to 16). The MIDI Editor can display and edit all 16 MIDI channels simultaneously. Each channel is assigned an individual colour, visible in both the Piano Roll and the CC lane.

The MIDI Editor display can be filtered to only show the notes from a particular MIDI Channel by selecting a Channel from the drop-down list.

There are two ways to assign MIDI Channels to notes:

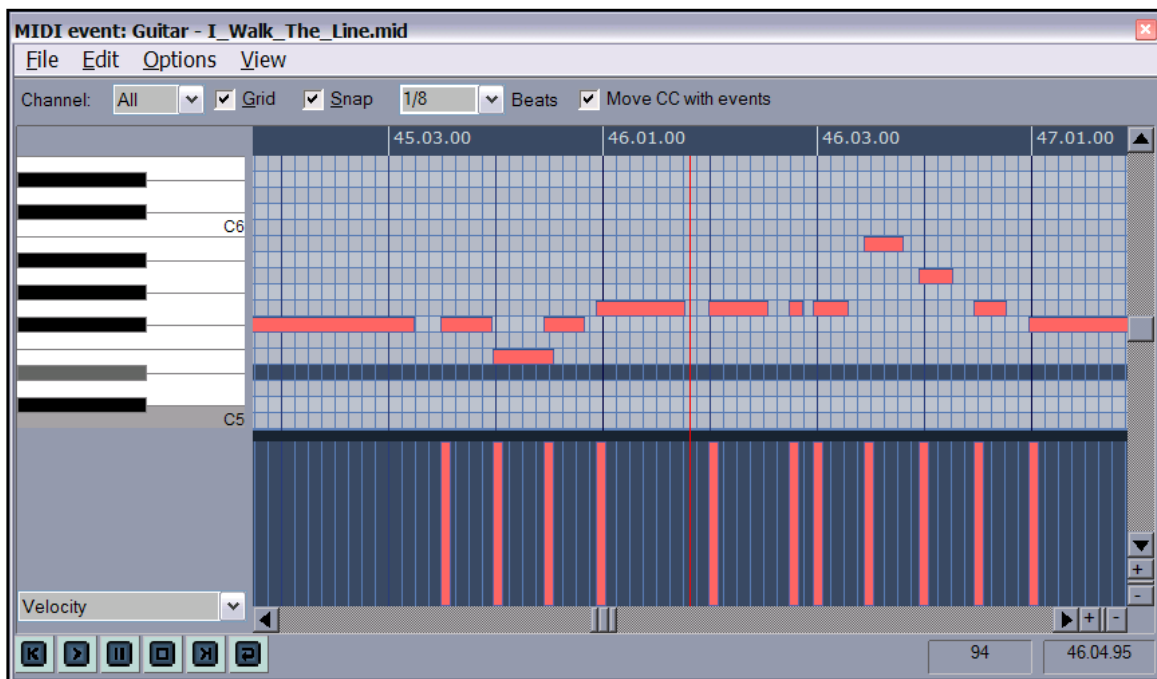
1. Select the note, then select Note Properties (Ctrl+F2) from the right-click menu. Set the MIDI Channel for the note by selecting it from the Channel list.
2. Right-click on the note, select Note Channel, and choose the Channel from the list.

Note: You can change the MIDI Channel for multiple notes by right-clicking on one of the selected notes and using the second (right-click) method. For example, to change the MIDI Channel for all of the notes in a MIDI Item, Select All (**Ctrl A**), right-click on one note, select Note Channel and set the required MIDI Channel. All of the notes in the MIDI Item will now change to the selected Channel.

12.8 MIDI Editor Modes

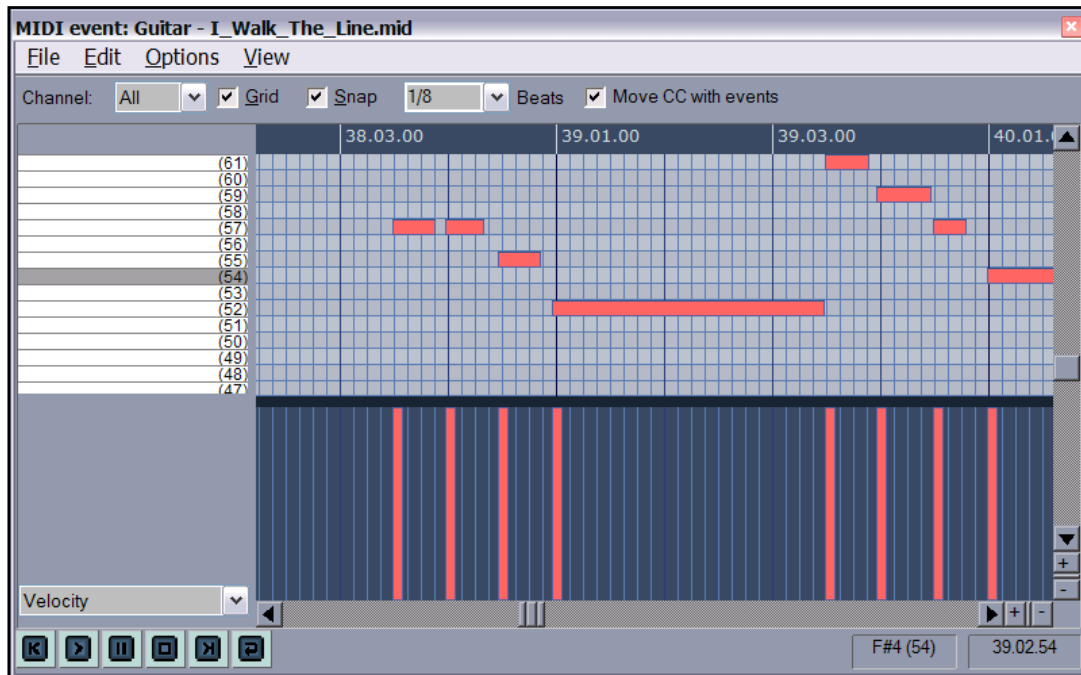
The MIDI Editor has three modes, accessible from the **Views** menu. These are:

1. **Piano Roll View** – keyboard shortcut **Alt 1**. This is shown below.
2. **Named Notes** – keyboard shortcut **Alt 2**.
3. **Event List** – keyboard shortcut **Alt 3**.



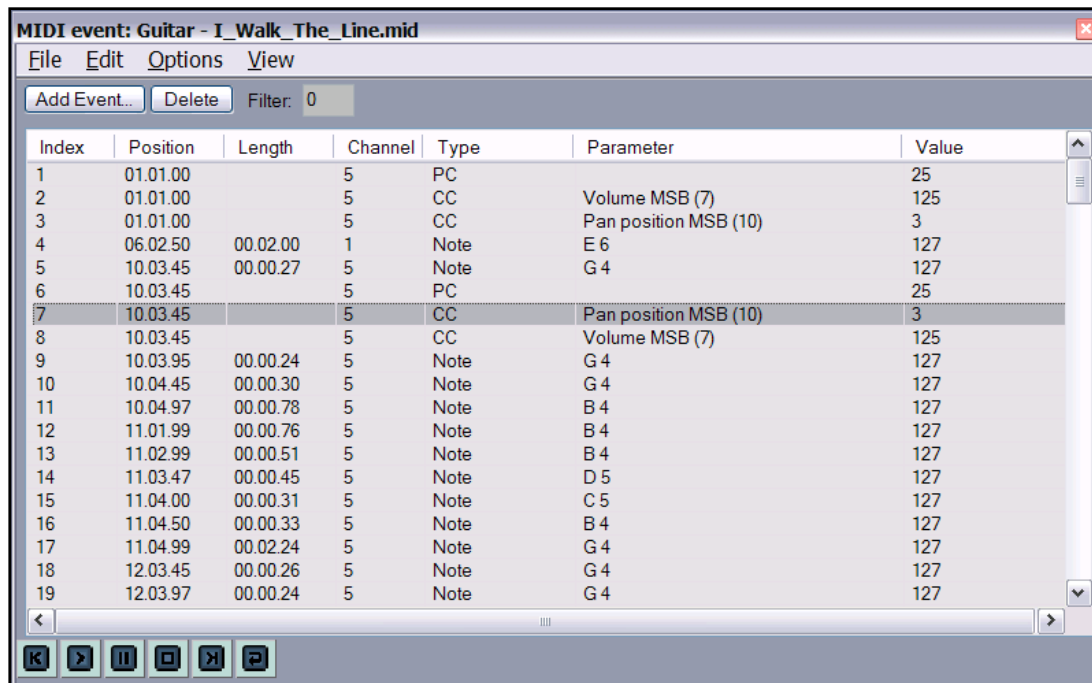
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Named Notes Mode:



Event List Mode:

In this mode you can filter, add events, select an existing event and right click to view a context menu (e.g. to delete or mute it) or insert a new event, or double click to modify any of the event's properties.



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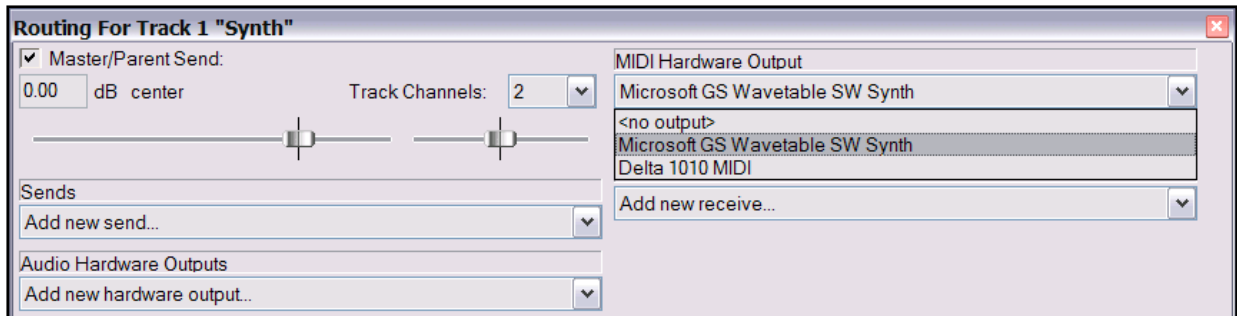
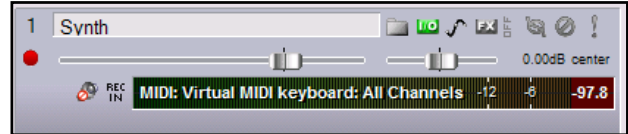
12.9 Using the MIDI Editor

Introductory Example

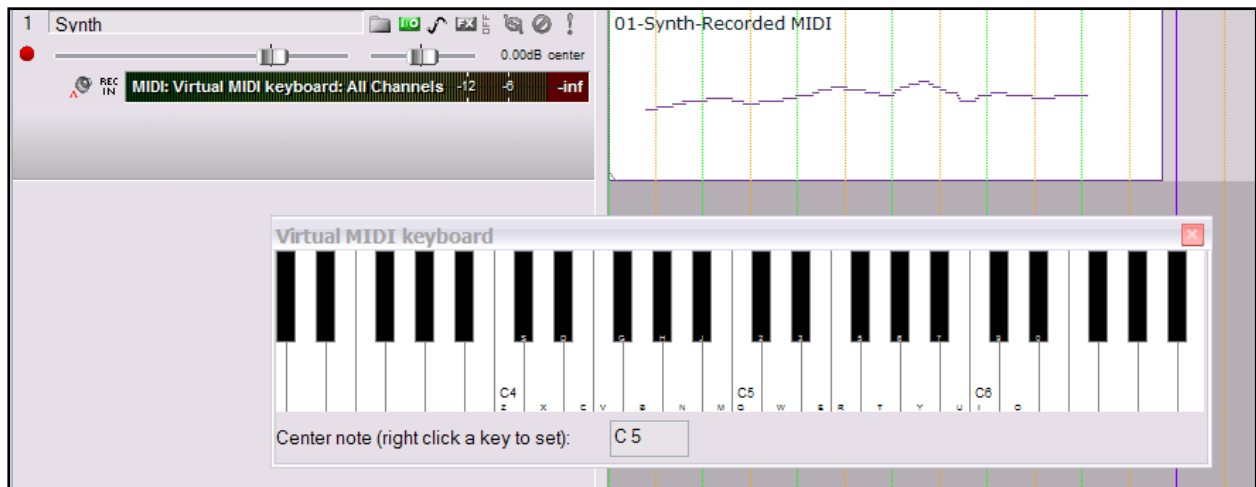
This simple example aims to introduce you to the MIDI Editor environment, and to give you a feel for how it works. We're just going to have some fun!

Don't be afraid to explore beyond this example, to familiarise yourself with its many other features in your own time.

1. Create a new empty project file. Save it as **MIDI Fun.RPP**
2. Insert one track into this file. Name this track **Synth**.
3. Use the **Show, Virtual MIDI Keyboard** command to display the MIDI keyboard.
4. Arm the Synth Track. Turn Input Monitoring On. Set the Input for this track to MIDI, **Virtual Keyboard, All Channels**.
5. Make sure its **MIDI Hardware Output** is directed to the **Microsoft GS Wavetable Soft Synth**.

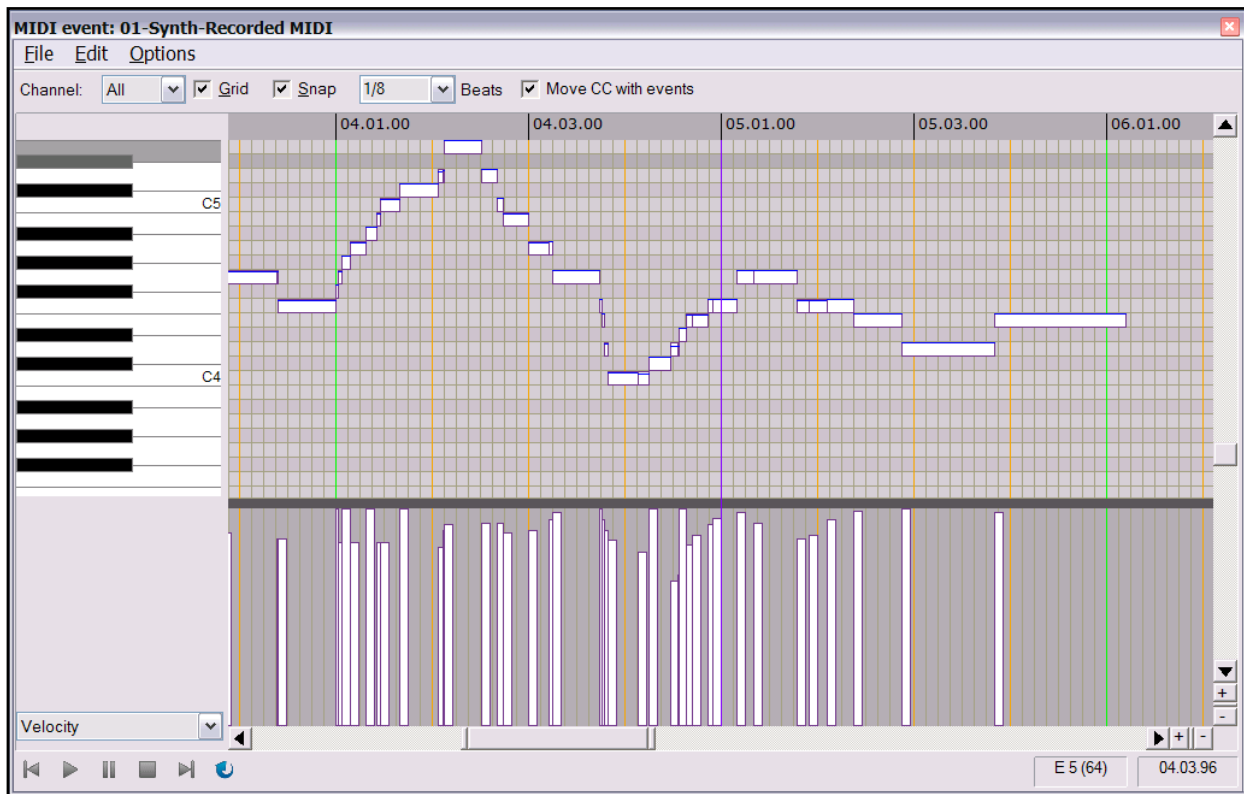


6. Press **Ctrl R** to start recording. Use the keys (on your PC keyboard) S to K and Z to M to play a simple tune. The longer you hold down each key, the longer the note will be. Don't worry if it isn't too melodic. The only purpose of this tune is that we are going to use it to explore the MIDI Editor. After 20 or so seconds, press **Ctrl R** to stop recording. Your MIDI track should be displayed on the screen, *similar* to this:



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7. Right click over the MIDI Item, then choose **Open Items with Built In MIDI Editor**. You should see something similar to this:

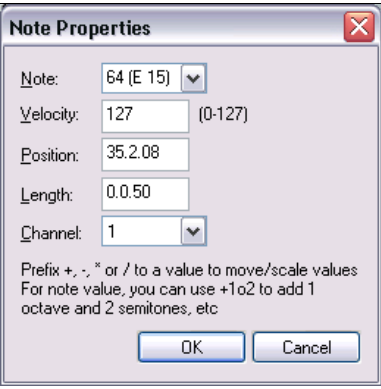


8. Notice that you can navigate and zoom within the MIDI Editor just as you do within the Track View. In particular, the following are especially useful:

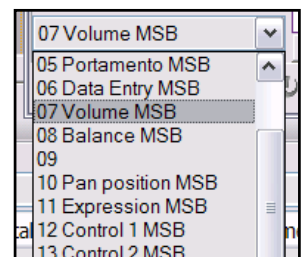
Method	Result
Page Down	Zoom Out vertically.
Page Up	Zoom In vertically.
+	Zoom In Horizontally.
-	Zoom Out Horizontally.
Home	Go to start of Item
End	Go to end of Item

9. Spend a few moments navigating and zooming within the MIDI Editor.
10. The following table is a summary of mouse editing techniques within the MIDI Editor. Try them out to your heart's content.

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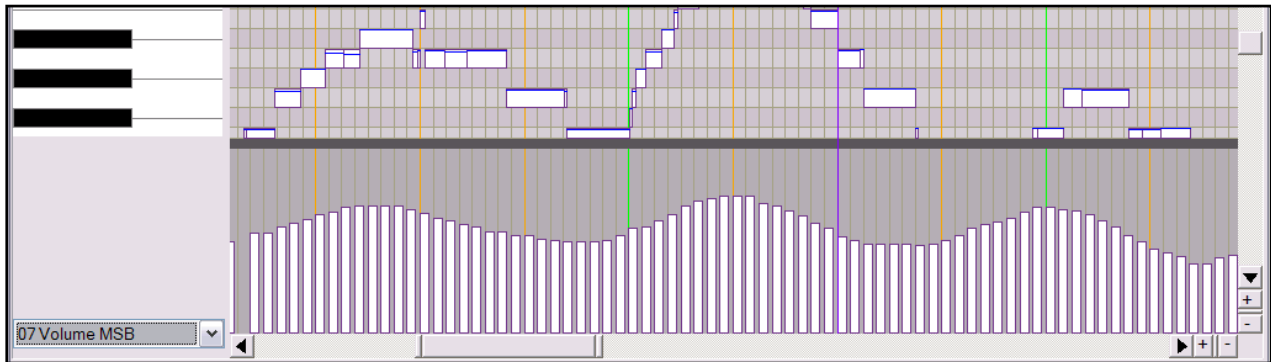
Method	Purpose
Position mouse over any note – mouse displays as white arrow	Click, hold, drag and drop to move note to new position.
Click mouse on note	 <p>Selects Note.</p> <p>Normal Windows editing keystrokes apply, e.g. Delete to delete, Ctrl C to copy, etc. Right click for context menu, which includes Note Properties dialog box (shown left).</p> <p>This can be used to change the value of any displayed property.</p>
Right click, hold, drag to "lasso" a number of notes, then release mouse.	Selects all items lassoed.
Alt Control while right click, hold drag to lasso, then release mouse.	Adds lassoed notes to current selection
Position mouse over start or end of note – mouse changes to double headed horizontal black arrow.	Click, hold drag left or right to shorten or lengthen note.
Click on any note in a selection, then drag and drop	Moves entire selection.
In CC Lane, click mouse anywhere on or above a displayed vertical bar.	Decreases or increases the value – for example, this can be used to decrease or increase a note's velocity.

- Click on any note to select it. Press **Delete** to delete it.
- Hover your mouse over the boundary of any other note. Click hold and drag to extend that note's duration.
- Drag and drop the note to a new position.
- Press **Ctrl** while dragging and dropping the note to copy it to a new position.
- In the CC Lane, select **Velocity** from the Selection Menu. Click on any of the displayed vertical bars to decrease that note's velocity.
- Now display the **CC Lane Selection Menu** and select **Volume**.
- Zoom out so that the MIDI Editor window displays your entire tune.
- Click and hold down your left mouse button in the CC Lane, at the far left. Sweep across to the right, moving it slightly up and down as you go. Release the mouse. You have just effectively added a curve which will control the volume of playback:

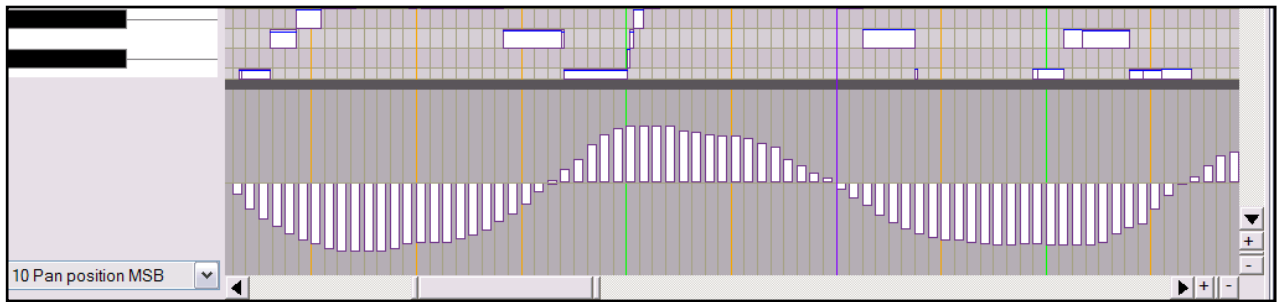


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19. Play the tune. Notice how the volume fades up and down. Of course, you could make further adjustments if you wish.



20. Now repeat step 19, this time with only gentle variations in volume. Notice that your new settings automatically override the old ones:
21. Now select **Pan Position** from the CC Selection menu, and perform another sweep so that the tune will pan back and forth a little between left and right speakers when it is played back.

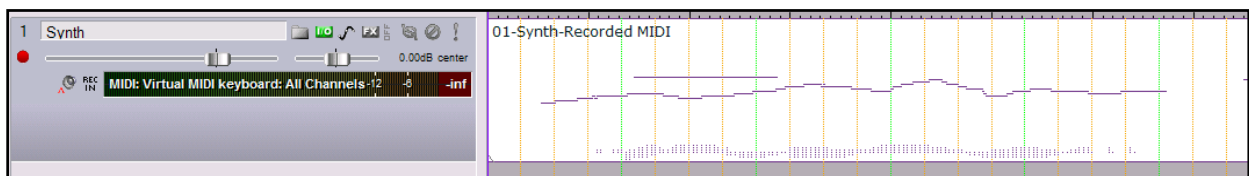
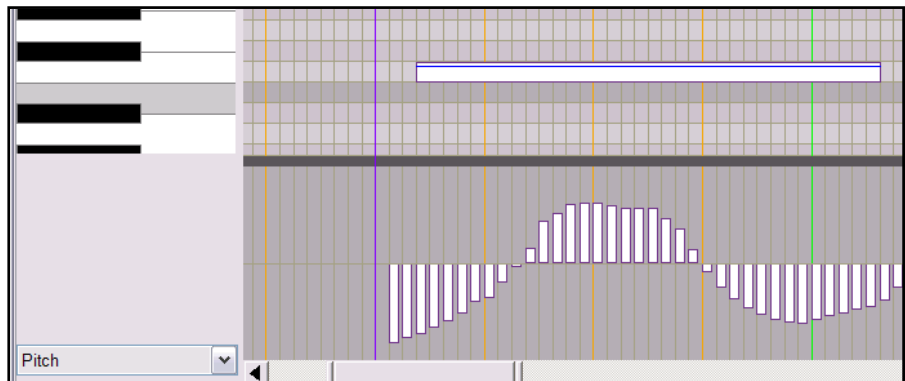


22. Now click and drag anywhere in the MIDI Editor window to draw a long note, as shown:

From the CC Selection Menu, choose **Pitch**.
With your mouse, draw a curve as shown below.
Notice how the pitch changes when the note is played.

23. Close the MIDI Editor.

24. Save the file and play it.
All of the changes that you made should be heard. You should also be able to see them near the foot of your MIDI track, beneath the notes:



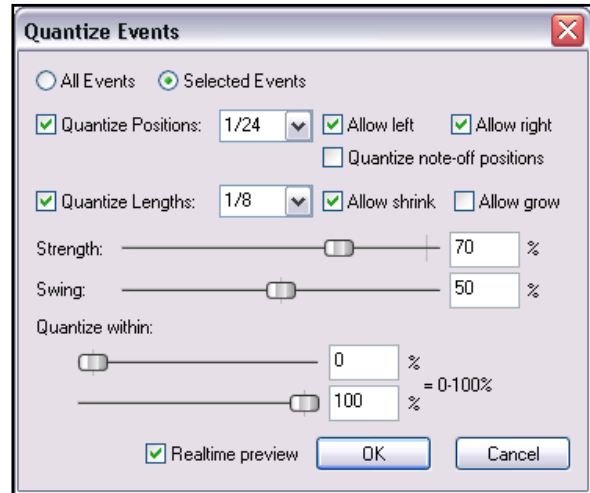
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12.10 Quantization Overview

The term **Quantize** refers to the process of aligning a set of musical notes to a precise setting. This results in notes being set on notes and on exact fractions of notes. When you instructs the music application to quantize a certain group of MIDI notes in a song, the program moves each note to the closest point on the timing grid. The purpose of quantization is to provide a more uniform timing of sounds. Quantization is frequently applied to a record of MIDI notes created by the use of a musical keyboard or drum machine.

Quantize is available by choosing the **Edit, Quantize events** command from the MIDI Editor menu. This command causes the dialog box shown on the right to be displayed. Later in this chapter there is an example which should help you to understand how quantization works and what it does. Meanwhile, the following notes should be sufficient to give you at least a general overview.

The top pair of radio buttons allow us to quantize selected events or the whole sequence (all events). This can certainly come in handy if you just need to quantize a certain off section, or perhaps just the hihats of a drum section.



When enabled, the **Quantize Positions** checkbox, tells REAPER to move the start position of the midi events to align to the value you set. Note: A setting of 1/12 refers to one-twelfth of a note. You can select from the drop down list, or enter a value of your own (e.g. 1/24). This feature includes a number of options such as **Allow left** and **Allow right**.

When enabled, the **Quantize Length** checkbox tells REAPER to extend or shorten notes by moving the end position of each note. You can select from the drop down list, or enter a value of your own (e.g. 1/24). You can choose to enable or disable **Allow shrink** and **Allow grow**.

The **Quantize Strength** setting adjusts how strictly notes are quantized. The lower you set the strength, the less 'magnetism' the grid has to the midi notes. This is very useful in 'humanizing' a MIDI track.

The **Swing** control can also be set at any value between 0% and 100%.

The **Quantize within** settings allow you to specify a percentage range for quantizing. This is another tool available to you to help you preserve the human element of your MIDI items.

The **Realtime Preview** lets you test the result of your quantize options before you commit yourself by clicking on **OK**. This is useful for letting you experiment with different settings.

In REAPER, quantize is non-destructive – that is to say, the process can be reversed at any time. The various commands on the **Edit** menu are used to do this.

Unquantize selected events

Removes quantization from the selected events and returns the notes to their previous state.

Freeze quantization for selected events

Freezes the quantization for all currently selected events.

Quantize selected events using last settings

This bypasses the **Quantize Events** dialog box, making it quicker and easier for you to apply the same quantization settings to various disparate selections.

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12.11 Input Quantization

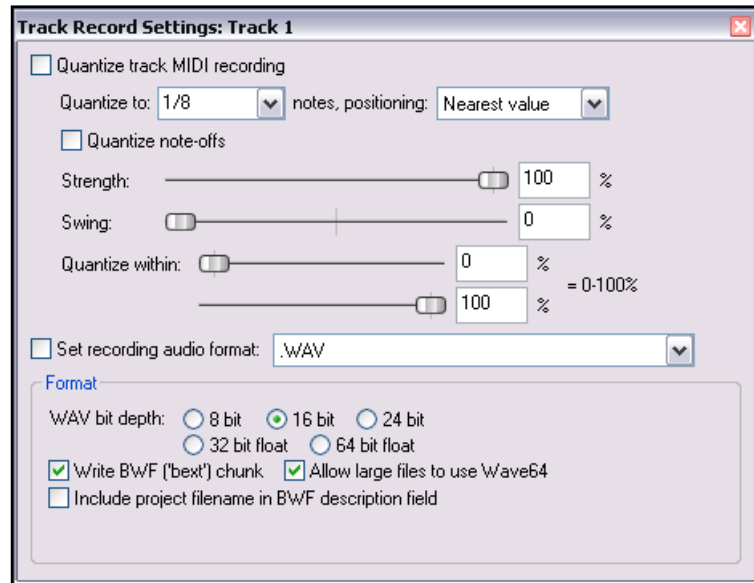
The term **Input Quantize** refers to a process by which MIDI notes are automatically quantized as they are entered. This could be, for example, by playing your MIDI keyboard, or even the REAPER Virtual Keyboard.

Input quantize is applied in REAPER on a per track basis. Simply right click over the track's VU Meter and choose **Track Recording Settings** from the context menu.

This causes the dialog box shown on the right to be displayed.

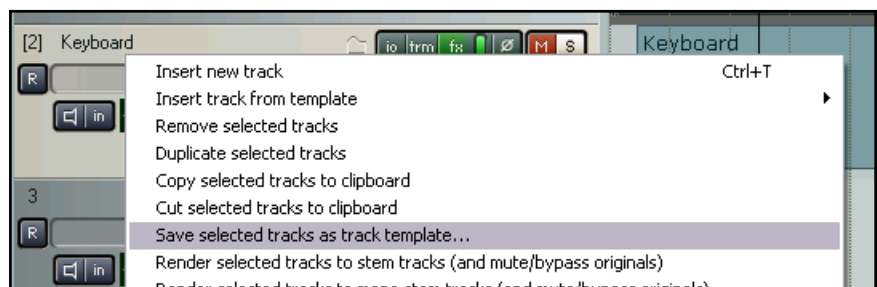
You should then select the option to **Quantize track MIDI recording**. Options then available include:

- The note length to be used for quantization (e.g. 1/8).
- Your quantize positioning preference. Options are **Nearest value**, **Previous value** and **Next value**.
- Whether to quantize note-offs.
- Quantization strength. A lower setting will allow more subtle variation, creating a more "human" effect by allowing minor variations in how strictly the quantization is applied.
- Swing setting. This can be between 0% and 100%. The best way to understand how these settings affect how your notes sound is to try a few examples.
- Quantize within % range. This is another way in which you can adjust your quantize settings to preserve the human performance element.



Tip: Don't forget about track templates! When you have set up your input quantize settings to suit your normal preferences, you can save the track as a track template.

Of course, you may, if you wish, save several different templates with different settings.



Example

The following section contains an exercise designed to help you understand quantization.

The actual steps that the example takes you through have been selected not because it is suggested that you would literally want to apply those same settings to your own work, but rather to help you to understand what is the purpose of the various Quantize options and settings.

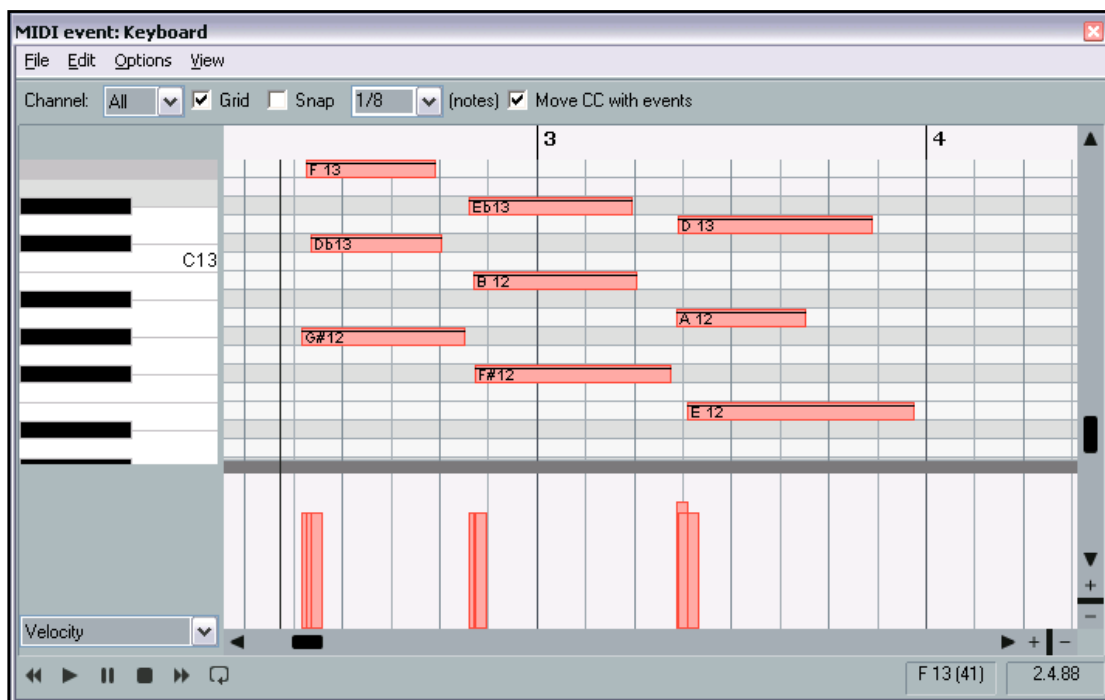
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12.12 Quantization Example

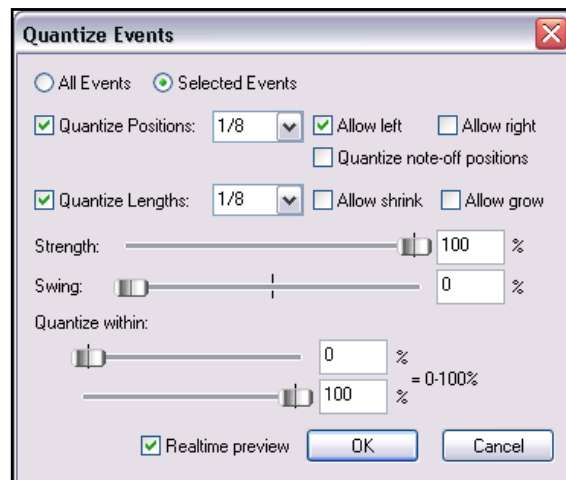
The example that follows will introduce you to how to use the Quantize feature of REAPER. Treat the exercise as a learning opportunity and be prepared to experiment.

Example

1. Create a new empty project file. Save this file as **Quantize Example.RPP**. Insert one track.
2. Display the **I/O** window for this track and select **MIDI GS Wavetable Software Synth** as the output device. Create an empty MIDI item about 6 seconds long.
3. Open this MIDI item in the MIDI Editor, then draw a sequence of events more or less as shown. For the purpose of this example, make sure **Grid** is displayed and select **1/8 note** intervals. Grid display is not essential, but it will help you to understand what is going on.

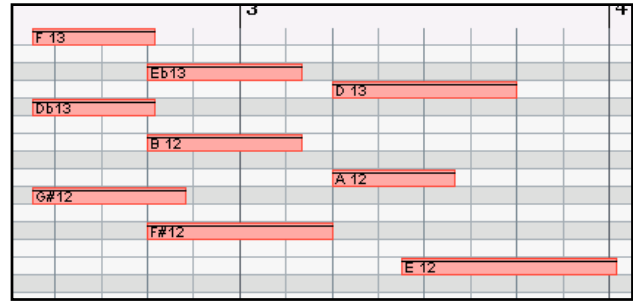


4. Play the tune.
5. Press **Ctrl A** (to select all events), then press **Q** to display the **Quantize Events** dialog box.
6. Choose the settings shown on the right. Notice the position is set to 1/8 and Allow left is selected. Note-off positions are not quantized, neither grow nor shrink are allowed. Strength is 100% and Swing is 0%.
7. Select the **Realtime preview** option. Leave this selected for this entire exercise.

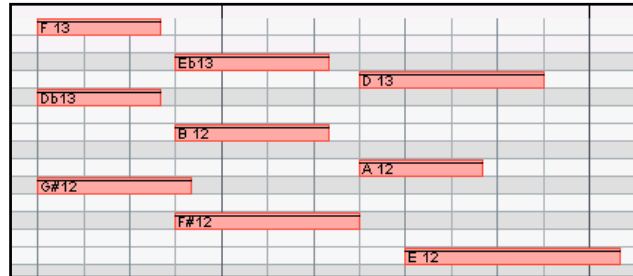


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8. Observe how the start position of each set of events has now been synchronised, all starting at an exact $1/8^{\text{th}}$ of a note position. In each case, the event has been shifted to the nearest synchronisation position to its left.
9. Press **Play** on the Transport Bar to play the tune. Do this after each change.
10. Do not yet choose **OK** or **Cancel**. Keep the **Quantize Events** dialog box open.



11. Deselect the **Allow Left** option. The events return to their original positions.
12. Now select the **Allow Right** option. Notice that the starting point of the events are lined up with $1/8^{\text{th}}$ note positions, but this time they are positioned at the nearest $1/8^{\text{th}}$ note to their right.

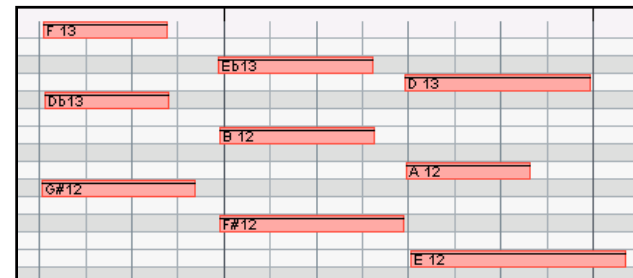


13. Now slowly move the **Strength** fader from 100% towards 0%. Notice that as you do so, the various sets of events move slightly out of perfect alignment. Many people believe that this effect makes the music sound more humanised and less like a computer.

14. Leave the **Strength** setting at around 70%.

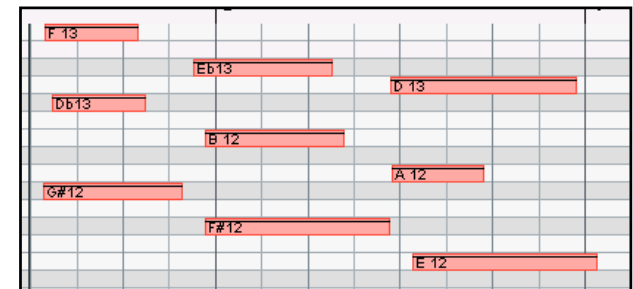
15. Now experiment with adjusting the **Swing** setting. This too can result in a more pleasing sound. For this example, leave the **Swing** setting at around 50%.

16. Now enable the **Allow left** option. Some – but only some – of your events will now move (see right). When both Allow left and Allow right are enabled, each individual event will be aligned with whichever of the two $1/8^{\text{th}}$ positions is nearer to it.



17. Now select the **Quantize Lengths** option and turn on **Allow shrink**. Notice that most or all events are shrunk, so that each event's length is now an exact multiple of $1/8^{\text{th}}$ of a note. If instead of shrink you selected **Allow grow**, then the events would be extended to the nearest exact multiple of $1/8^{\text{th}}$. If you allowed both, each event would be shortened or lengthened to whichever exact multiple of $1/8^{\text{th}}$ was nearest.

18. Now change (within the Quantize Events dialog box) the **Quantize Position** setting to **1/32**. The starting position of each event is now aligned to an exact multiple of $1/32$ instead of $1/8$. This should have the effect of separating the starting points a little more (see right).



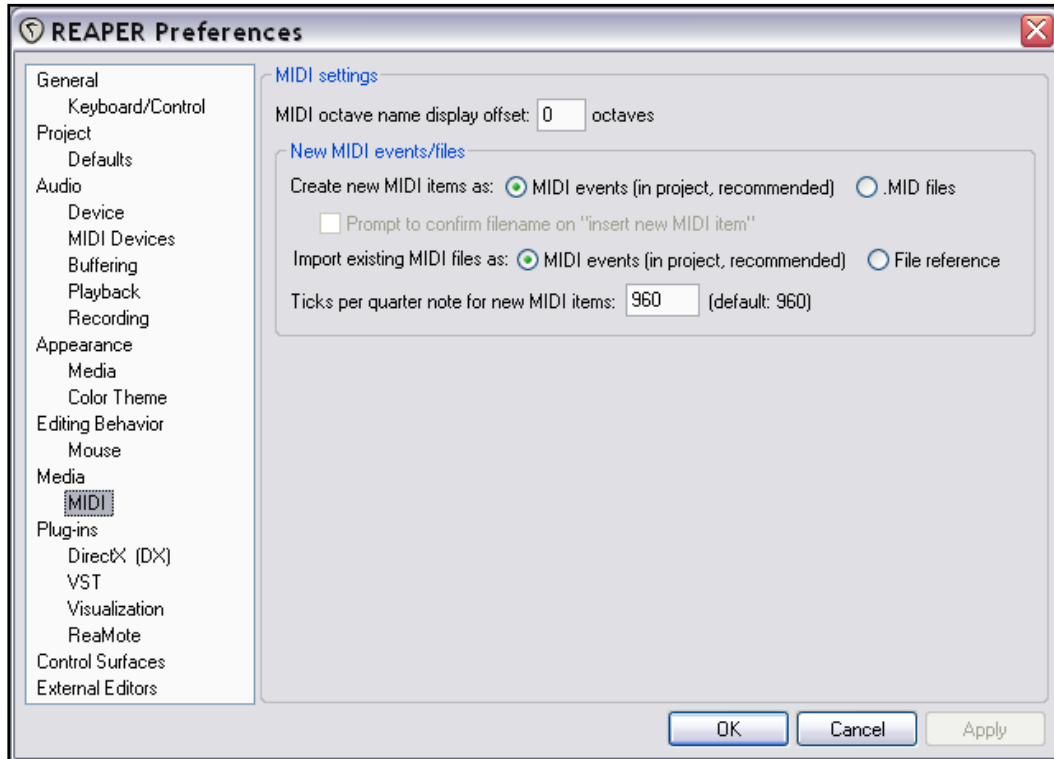
19. Save the file.

20. Your turn now. Experiment some more! For example, you can experiment with the **Quantize note-off** setting, to see how it affects the position or length (depending on other settings) of event endings.

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12.13 MIDI Preference Settings

To specify your MIDI preferences, choose the **Options, Preferences** command (**Ctrl P**) and then select the **MIDI** page. This causes the following window to be displayed:



Options available include:

Option	Comments
MIDI octave name display offset	Specifies keyboard position relative to MIDI note number.
Create new MIDI items as MIDI events in project	Your new MIDI items are created as individual items within the current project.
Create new MIDI items as .MID files	Each MIDI item that you create is stored as a separate .MID file.
Import existing MIDI files as MIDI events in project	Imported MIDI files are merged into the current project but as separate items.
Import existing MIDI files as file reference	Imported MIDI items are still stored as separate MIDI files, referenced via the Item Properties.
Ticks per quarter note for new MIDI items	Sets the number of ticks per quarter note assigned for new MIDI items.

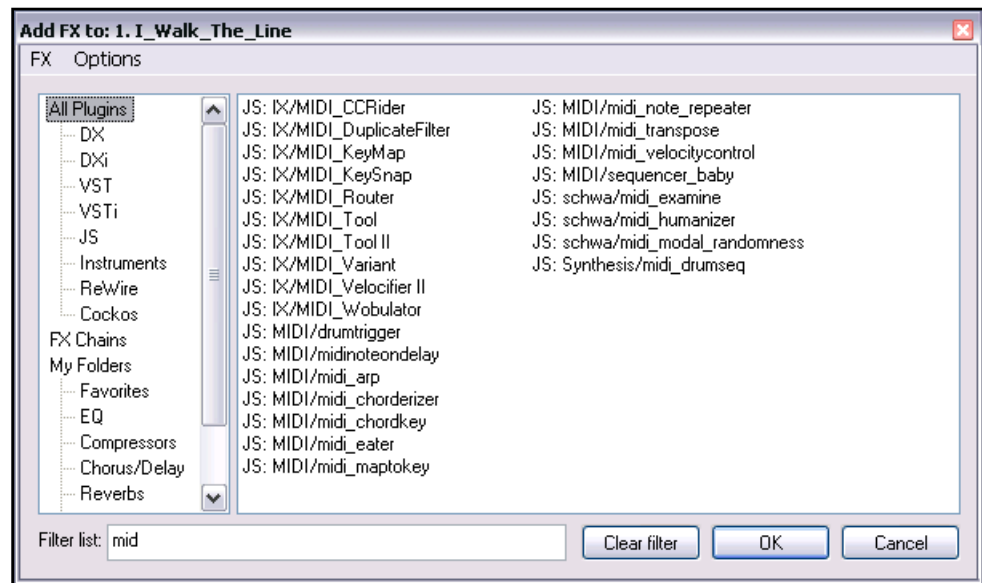
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12.14 Some MIDI Plug-ins

REAPER includes a good selection of plug-ins that can be placed into the FX window of any of your MIDI tracks. Many of these (the IX series) have been written and developed by Philip Consadine. These are not really part of the MIDI Editor, but now is a good time to look at them.

The basic steps involved in inserting and using Track FX are covered in the section [Track FX Basics](#). If you are unfamiliar with these steps, you should review that section before proceeding.

If you display the **Add FX** window and type *midi* into the filter list box (as shown on the right), you will see a list of those MIDI FX that are currently available. Below are listed some of the JS MIDI FX supplied with REAPER.



FX Name	Comments
MIDI_Tool and MIDI Tool II	These do interesting and fun things to MIDI note events.
MIDI_CCRider	A LFO Controlled CC generator.
MIDI_Wobulator	A LFO Controlled automatic pitch wobulator.
MIDI_Router	Routes events from one channel to another.
MIDI_DuplicateFilter	Blocks duplicate notes.
MIDI_Velocifier II	This is a pattern based velocity modifier.
MIDI_Variant	A pattern based, musically aware, randomification monster.
MIDI_KeySnap	This is a good cheat for bad pianists.
MIDI_KeyMap	A MIDI key mapping utility.
midi_transpose	Transposes a note or a range of note.
midi_velocitycontrol	Used to vary and control velocity on a MIDI track.
sequencer_baby	An awesome pattern sequencer.
Synthesis/midi_drumseq	Use this drum sequencer with your favourite patch set.

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Tip: You can use [automation envelopes](#) with any of these plug-ins and their parameters to control their behaviour in real time. So, for example, by using the midi-velocity control plug-in you can effect variations in velocity without needing to use the MIDI Editor to do this.

For more information about how to use these and other MIDI plug-ins, visit the Cockos web site, and in particular http://www.cockos.com/wiki/index.php/Jesusonic_Effects_Documentation#MIDI

12.15 Creating a MIDI Toolbox

Earlier on this guide, you were introduced to how you can [assign shortcut keys](#) to various REAPER commands. This facility extends to both the REAPER **MIDI Editor** and the **MIDI Event List Editor**. To access this area, first open the **Preferences** window (**Ctrl P**) and select the **Keyboard Shortcuts** page. Then display the drop down list of Sections and select the required option from the list (see right).

You can then create your own toolbox of shortcuts for commands and sequences of commands for use when working with the MIDI Editor.

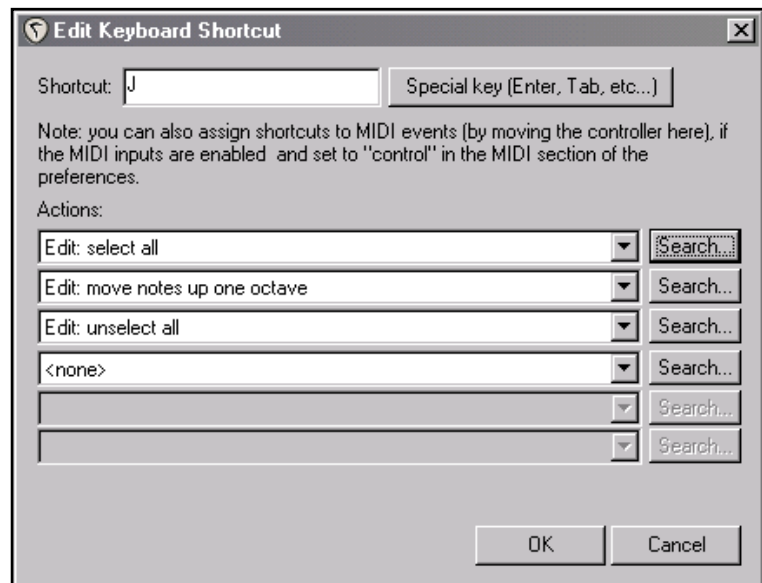
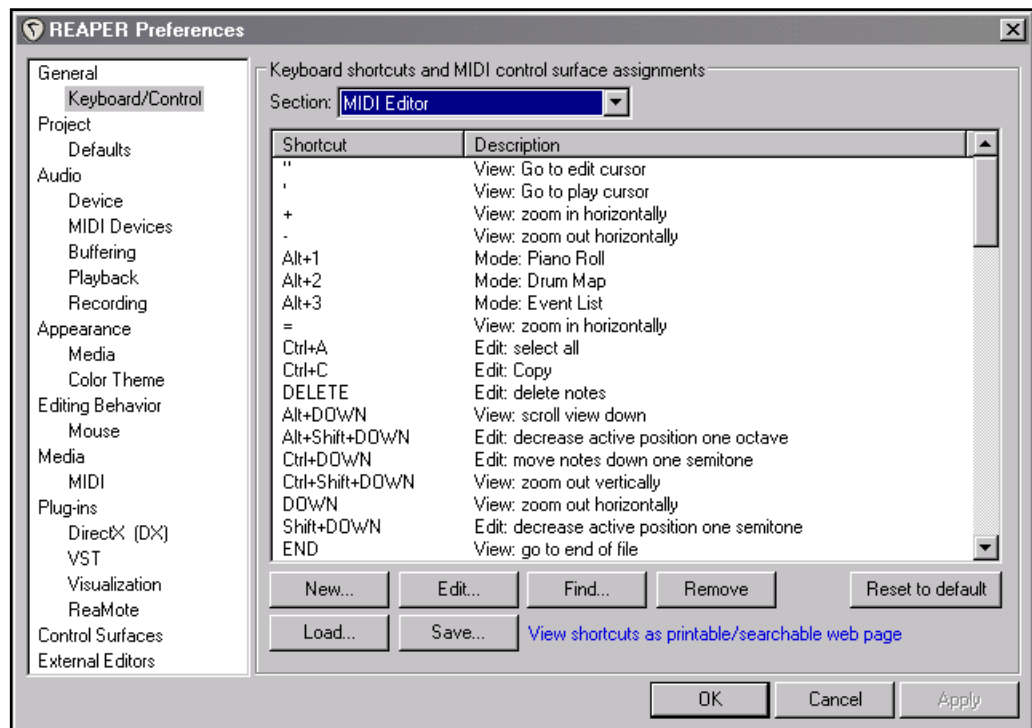
In this section, we will introduce you to one or two simple examples. As elsewhere in this User Guide, you should focus on the technique rather than the examples. That way you should find yourself able to apply this technique to suit your own needs. Here are some examples of sequences for which you might wish to create your own MIDI Editing Macros.

Move All Notes Up One Octave

This macro will select all notes in the Media Item currently open in the MIDI Editor window, move them up an octave, then deselect all notes.

To create this macro (shown right), follow this sequence:

1. In REAPER Track View, press **Ctrl P** to open the **Preferences** window, then click on the **Keyboard/Control** section.



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2. Display the **Section** drop down list and choose **MIDI Editor** (see above).
3. Click on the **New...** button to create a new macro.
4. Type **J** to assign this as the shortcut key. Of course, you could use any key you like – this is just an example.
5. Click on the first **Search...** button and select the action **Edit: Select All** then click on **OK**.
6. Repeat this to select the action **Edit: move notes up one octave** for the second action, and **Edit: unselect all** for the third action.
7. Click on **OK** then **OK** again.

Move All Notes Down One Octave

If you wish, you can create a similar macro, perhaps with the shortcut **Shift J**, to move all notes down an octave. The sequence of commands would be as follows:

Edit: Select all

Edit: Move notes down one octave

Edit: Unselect all

You will now find that as you play any track in the MIDI Editor, you can use just the **J** key to move the entire **Move All Notes Up One Octave** piece up by one octave, and **Shift J** to move it down an octave.

Remove Duplicate Events

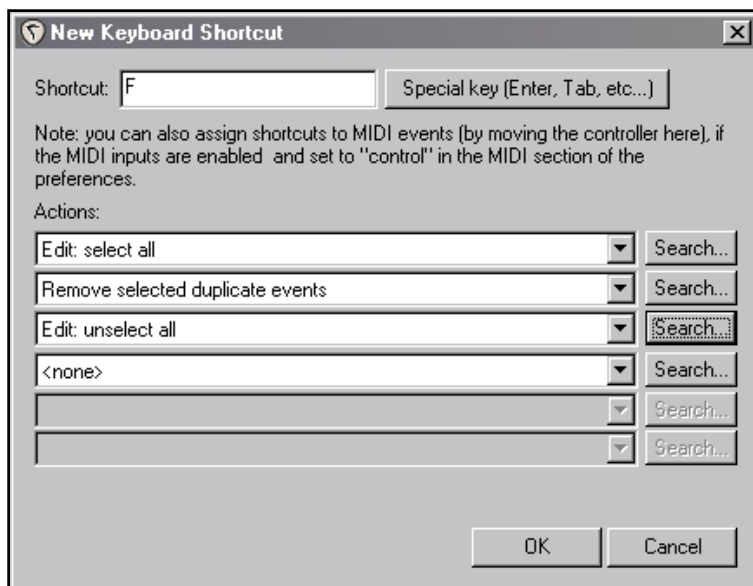
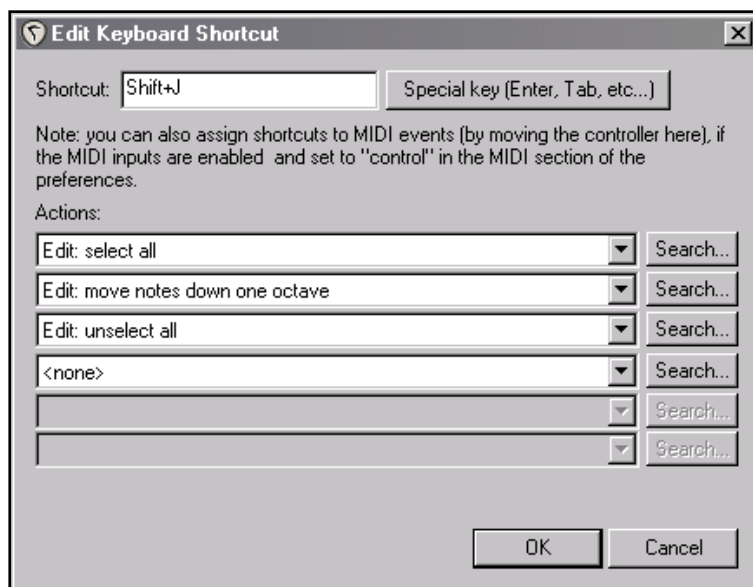
A macro with this command sequence will automatically remove all duplicate events from the item currently open in the MIDI Editor:

Edit: Select all

Remove selected duplicate events

Edit: Unselect all

You can, of course, assign a keyboard shortcut of your choice for this macro.



Tip: Keyboard Shortcut assignments within REAPER can be used for separate macros in separate sections. For example, you can use **F** and **Shift F** here to execute the sample **MIDI Editor** macros outlined in this section, and also use **F** and **Ctrl F** to execute completely different macros in the **Main** section.

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12.16 MIDI Editor Action Assignments

In the previous section, you were shown several examples of how you can assign keystrokes to perform an action, or series of actions, within REAPER's MIDI Editor (using **Options, Preferences, Keyboard / Control**). These include a number of actions that are not available on the main or context menus.

In order to make more effective use of this editor, it is worth taking the time to familiarise yourself with some of the assignable actions. Some of these already have default assignments. Also, because new actions are frequently added, you should check the Keyboard Preferences window for any recent changes.

Remove selected duplicate events	Edit: move edit cursor left by grid
Set selected note ends to start of next note	Edit: move edit cursor right by grid
Quantize events window	Edit: insert note
Quantize selected events using last settings	Edit: insert note at mouse cursor
Unquantize selected events	Edit: decrease active position one semitone
Freeze quantization for selected events	Edit: split items at mouse cursor
Edit: split items	Mode: Drum Map
Mode: Event List	Mode: Piano Roll
Edit: mute events	File: Revert file (MIDI file mode only)
View: Toggle snapping	Edit: note properties window
Transport: toggle repeat	View: Go to edit cursor
Edit: delete notes	View: scroll view down
Edit: Copy	View: scroll view left
File: Save file (MIDI file mode only)	View: scroll view right
View: toggle grid	View: scroll view up
Edit: increase active position one octave	View: zoom in horizontally
Edit: decrease active position one octave	View: zoom in vertically
Edit: move edit cursor left one pixel	View: zoom out horizontally
Edit: note properties	View: zoom out vertically
Transport: play/pause	View: Go to play cursor
Edit: Undo	Edit: unselect all
Edit: move notes down one semitone	View: toggle show times relative to project
Edit: move notes up one octave	Options: toggle single click to add notes mode
Edit: move notes down one octave	View: toggle show velocity handles on events
Edit: move notes up one semitone	View: toggle show note names
Edit: paste	Options: preview notes on add/edit
Edit: move notes left one pixel	Options: step sequencer mode
Edit: move notes left one grid unit	Options: synchronize transport with main transport
Edit: Redo	Options: toggle move CC events with notes
Edit: select all	Options: toggle window docking
Edit: move notes right one grid unit	Transport: play
Edit: move notes right one pixel	Transport: stop
Edit: Cut	Transport: pause
Edit: move edit cursor right one pixel	Edit: add event
Edit: increase active position one semitone	Edit: set selected notes to channel 1 (thru)
Transport: play/stop	Edit: set selected notes to channel 16
	Edit: reverse events

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File: export contents as .MID

File: close window

Step sequencer: insert note at current -12 semitones (thru)

Step sequencer: insert note at current -1 semitones

Step sequencer: insert note at current note

Step sequencer: insert note at current + 1 semitones (thru)

Step sequencer: insert note at current + 12 semitones

Grid: set division to 1/48

Grid: set division to 1/32

Grid: set division to 1/24

Grid: set division to 1/16

Grid: set division to 1/12

Grid: set division to 1/11

Grid: set division to 1/10

Grid: set division to 1/9

Grid: set division to 1/8

Grid: set division to 1/7

Grid: set division to 1/6

Grid: set division to 1/5

Grid: set division to 1/4

Grid: set division to 1/3

Grid: set division to 1/2

Grid: set division to 1

Grid: set division to 2

Grid: set division to 3

Grid: set division to 4

Grid: set division to 5

Grid: set division to 7

Grid: multiply grid size by 2

Grid: multiply grid size by 3

Grid: multiply grid size by 1/2

Grid: multiply grid size by 1/3

Channel: go to previous channel

Channel: go to next channel

Channel: show all channels

Channel: show channel 1 (thru)

Channel: show channel 16

CC: next CC lane

CC: previous CC lane

CC: Set CC lane to Velocity

CC: Set CC lane to Pitch

CC: Set CC lane to Program

CC: Set CC lane to Channel Pressure

CC: Set CC lane to 04 Bank Select MSB (thru)

CC: Set CC lane to CC123

12.17 Event List Editor Action Assignments

The following summary table lists those Event Editor actions that are assignable. For more details (including any default assignments, open your **Options, Preferences, Keyboard / Control** settings.

Transport: toggle repeat

Edit: Copy

Edit: delete notes

Mode: Event List

File: Save file (MIDI file mode only)

Edit: mute events

Edit: note properties

Transport: play/pause

Edit: Undo

Remove selected duplicate events

Set selected note ends to start of next note

Quantize events window

Quantize selected events using last settings

Unquantize selected events

Freeze quantization for selected events

Edit: paste

Edit: Redo

Edit: select all

Edit: Cut

Transport: play/stop

Edit: insert note

Edit: insert note at mouse cursor

Mode: Drum Map

Mode: Piano Roll

File: Revert file (MIDI file mode only)

View: Go to edit cursor

View: Go to play cursor

View: zoom in horizontally

View: zoom out horizontally

Edit: unselect all

View: toggle grid

Edit: split items

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Edit: split items at mouse cursor
View: Toggle snapping
View: scroll view down
View: scroll view left
View: scroll view right
View: scroll view up
Edit: decrease active position one semitone
Edit: increase active position one semitone
Edit: decrease active position one octave
Edit: increase active position one octave
View: zoom out vertically
View: go to end of file
Edit: note properties window
Edit: move edit cursor left by grid
Edit: move edit cursor right by grid
Edit: move edit cursor left one pixel
Edit: move edit cursor right one pixel
View: zoom out vertically
View: zoom in vertically
View: toggle show times relative to project
Options: toggle single click to add notes mode
View: toggle show velocity handles on events
View: toggle show note names
Options: preview notes on add/edit
Options: step sequencer mode
Options: synchronize transport with main transport
Options: toggle move CC events with notes
Options: toggle window docking
Transport: play
Transport: stop
Transport: pause
Edit: add event
Edit: set selected notes to channel 1 (thru)
Edit: set selected notes to channel 16
Edit: reverse events
File: export contents as .MID
File: close window
Step sequencer: insert note at current -12 semitones (thru)
Step sequencer: insert note at current -1 semitones
Step sequencer: insert note at current note
Step sequencer: insert note at current + 1 semitones (thru)
Step sequencer: insert note at current + 12 semitones
Edit: move notes up one semitone
Edit: move notes down one semitone
Edit: move notes up one octave
Edit: move notes down one octave

Edit: move notes left one pixel
Edit: move notes right one pixel
Edit: move notes left one grid unit
Edit: move notes right one grid unit
Grid: set division to 1/48
Grid: set division to 1/32
Grid: set division to 1/24
Grid: set division to 1/16
Grid: set division to 1/12
Grid: set division to 1/11
Grid: set division to 1/10
Grid: set division to 1/9
Grid: set division to 1/8
Grid: set division to 1/7
Grid: set division to 1/6
Grid: set division to 1/5
Grid: set division to 1/4
Grid: set division to 1/3
Grid: set division to 1/2
Grid: set division to 1
Grid: set division to 2
Grid: set division to 3
Grid: set division to 4
Grid: set division to 5
Grid: set division to 7
Grid: multiply grid size by 2
Grid: multiply grid size by 3
Grid: multiply grid size by 1/2
Grid: multiply grid size by 1/3
Channel: go to previous channel
Channel: go to next channel
Channel: show all channels
Channel: show channel 1 (thru)
Channel: show channel 16
CC: next CC lane
CC: previous CC lane
CC: Set CC lane to Velocity
CC: Set CC lane to Pitch
CC: Set CC lane to Program
CC: Set CC lane to Channel Pressure
CC: Set CC lane to 04 Bank Select MSB
CC: Set CC lane to 05 Mod Wheel MSB
CC: Set CC lane to 06 Breath MSB
CC: Set CC lane to CC07 (thru)
CC: Set CC lane to CC123

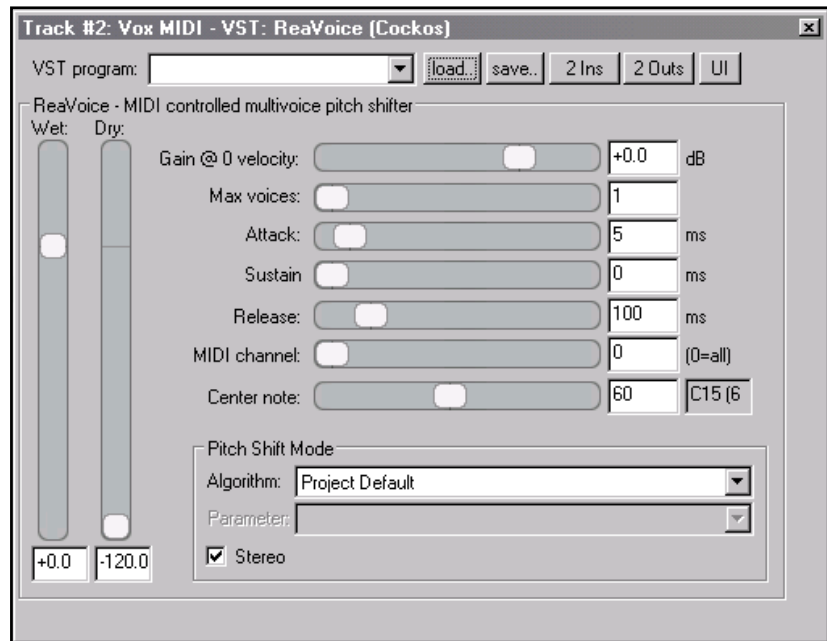
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12.18 MIDI Controlled Pitch Shift with ReaVoice

The **ReaVoice** plug-in (supplied with REAPER) can be used in conjunction with a recorded vocal track to create interesting pitch shift harmonies. As with many other plug-ins, **ReaVoice** can be used in a number of ways. In this section we will take you through just one example. After completing this example you should have the confidence to experiment with this plug-in's capabilities for yourself.

The procedure for using ReaVoice is as follows:

- Record the Vocal Track.
- Insert a new track immediately below the Vocal Track.
- Create a send from the Vocal Track to the new track. Initially at least, this should be Pre FX.
- Insert ReaVoice into the FX Window of the new track.
- Arm this track for recording. Select your MIDI keyboard as the Input Device and turn Input Monitoring on.
- Mute all tracks other than these two.
- Play the song. As you do so, play the keyboard, experimenting until you find an appropriate range of notes.
- When you have worked out what you want to play, press **W** to return to the beginning, then **Ctrl R** to record. Stop recording when finished.
- If you do not have a MIDI keyboard, you can either use REAPER's Virtual keyboard, or you can enter the notes by hand using the MIDI Editor.
- If you wish, you can record more than one harmony, selecting the Play All Takes option for the MIDI track items.
- After you have finished recording, you can use the MIDI Editor to polish up your work.

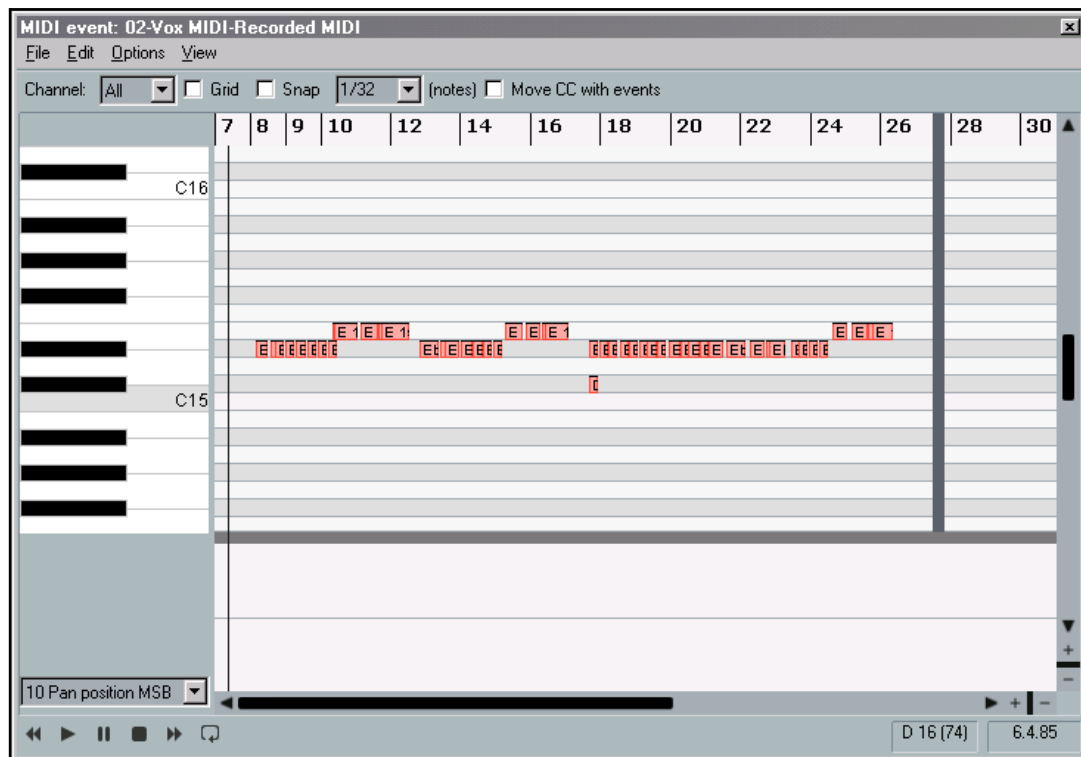


Example

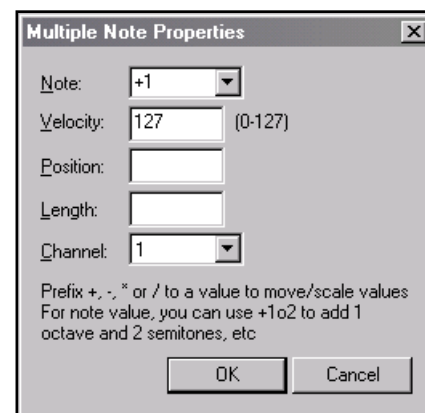
1. Open the file **All Through the Night.rpp** and save it as **All Through the Night REAVOICE.rpp**.
2. Mute all tracks except the Vox track.
3. Move the Vox track to the top, select and press **Ctrl T** to insert a new track. Your Vox track is now track 1 and the new track is track 2.
4. Name the new track **Vox MIDI**.
5. Display the **I/O** window for the **Vox MIDI** track and add a new **Pre FX Receive** from the Vox track.
6. Insert the **ReaVoice** plug-in into the FX Window for this track. For now you can accept its default settings, as shown above.

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7. Press **Alt B** to view the virtual keyboard.
8. Arm the track for recording. Make sure you turn **Input Monitoring** on and select the Virtual MIDI Keyboard (All Channels) as the **Input** device.
9. Play the track and as you do so play the Virtual MIDI Keyboard. Just for the sake of this example, select an area on the keyboard round about that shown.
10. When you have worked out where and what you wish to play, return the play cursor to the start of the song. Press **Ctrl R** to start recording and, for the purpose of this exercise, play the keyboard as you record up to about the 52 second mark.
11. Stop recording. Right click over the item that you have just recorded and choose **Open item with built-in MIDI editor** from the context menu.



12. As you play the song, you can of course edit any individual note or notes, for example, by moving them up or down, by lengthening them or shortening them, or by changing their pitch. Here are some more possibilities, just for fun and to give you some ideas.
13. Within the MIDI Editor window, press **Ctrl A** to select all events.
14. Press **Ctrl F2** to display the **Note Properties** dialog box.
15. In the **Note** box, type **+1** (as shown) then click on **OK**. This raises the entire selection by one semitone.
16. Experiment with other settings as you wish.
17. Save the file when finished.



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Notes

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13 REAPER Automation

13.1 What is Automation?

Automation really is one of the coolest features of REAPER.

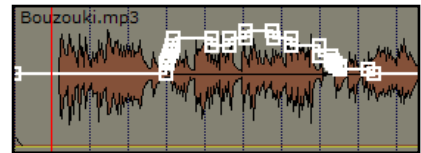
Automation enables you to ensure that when your project is played back, changes in such things as volume level or panning for different tracks can be remembered and played back in real time, with the project. At its simplest, for example, you can use automation to lift the volume of a lead instrument during a particular break or passage, or to add a little presence or warmth to the odd phrase here or there on a vocal track, to make it stand out in the mix a touch more.

As you will see in this section, that's only the beginning. When used well, Automation delivers the power to produce exactly the mix that you want.

13.2 Automation Methods

REAPER makes available to you two methods of automating your projects. Both have their own advantages. Try them both – you can use either method in your projects or a combination of both, as you prefer.

- **Writing Automation:** When writing automation, you are able to instruct REAPER to remember your actions – such as fading the volume control up and down for any track or tracks – as your project is played. These actions are used to create an envelope which is then reproduced when you play back or mix down the track in the future (see example, right).
- **Drawn Envelopes:** As an alternative to using your faders to create envelopes, you can shape them manually. This gives you a very fine degree of control over your project. You can manually draw in envelopes which will have the same effect as if actual fader movements had been recorded.



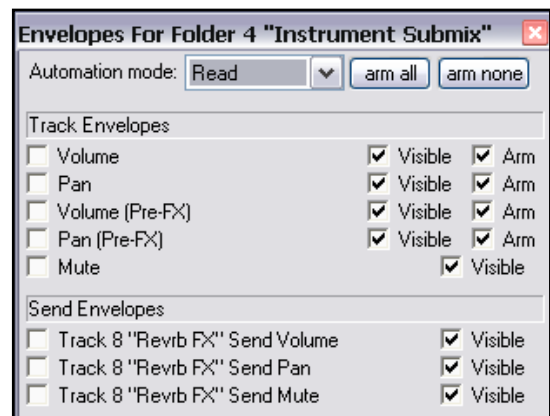
With both recorded and envelope automation, it is perfectly possible (and quite easy) to edit the automation instructions afterwards, or to remove them altogether if that's what you want.

13.3 Managing Envelopes

Any track's envelopes are managed by displaying the **Envelopes Window** for that track. This is displayed by clicking on the track's **Envelope** button. You use this window, for example to:

- Set the Automation Status for the track.
- Create an envelope (e.g. for Volume, Pan or Mute for a track or send).
- To show or hide an envelope from view.
- To Arm an envelope or Disarm it.

These issues will be explained and explored in the pages that follow.



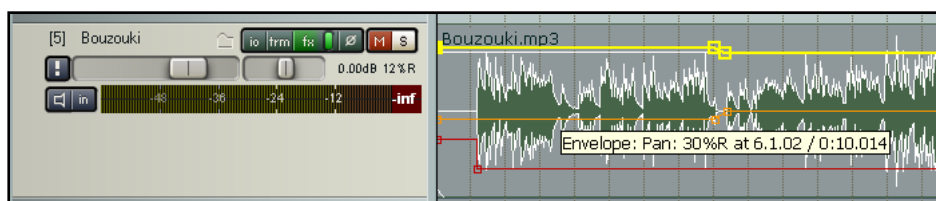
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13.4 Available Track and Send Envelopes

The following are the automation envelopes that by default are available for all tracks and sends. The question of envelopes for plug-ins and FX will be discussed later in this section.

Track Envelope	Description
Volume (Pre FX)	Adjusts the volume of the track signal that is fed to the track's FX chain. This is generally equivalent to the Gain control that you can find on some desks and mixers.
Volume	Adjusts the volume of the Track's Output, after, for example, any FX and panning has been applied. This determines the level of the signal that is sent to the Master Track.
Pan (Pre FX)	Pans more towards the left, right, or dead centre the signal that is sent to the track's FX chain.
Pan	Pans more towards the left, right, or dead centre the signal that is sent from the track to the Master Track.
Mute	This envelope has effectively only two states – On and Off. It is used to mute passages of a track.

Send Envelope	Description
Send Volume	Adjusts the volume of the track signal that is sent to the destination track. Exactly how this is applied will in part be determined by whether the Send itself is defined as Post Fader (Post Pan), Post FX or Pre FX.
Send Pan	Adjusts the panning of the track signal that is sent to the destination track. Exactly how this is applied will in part be determined by whether the Send itself is defined as Post Fader (Post Pan), Post FX or Pre FX.
Mute	This envelope has effectively only two states – On and Off. It is used to mute passages on a send.



In the example shown (left), the track that you can see has three automation envelopes – Volume, Pan and Mute.

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13.5 Writing Automation

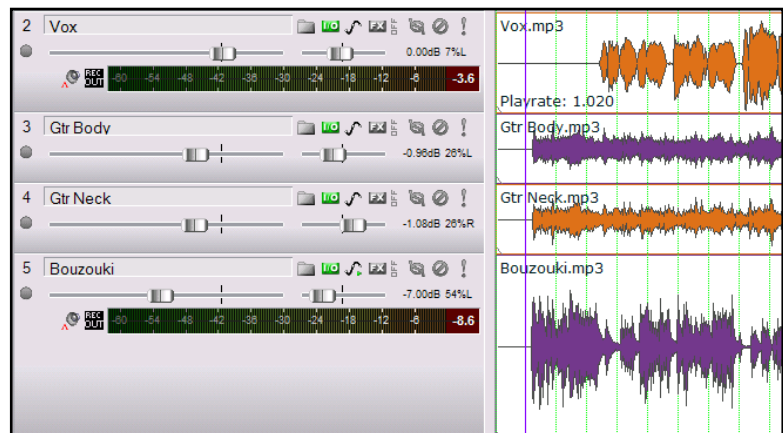
To create automation envelopes using the **Write** feature, use this method:

- In the Track Control Panel, click on the **Envelopes** button (shown right in both Default and Classic themes) to display the list of parameters that can be automated.
- Select the item you wish to automate, and make sure to also select the options **Visible** and **Arm**.
- Set Automation mode to **Write**.
- Close the Envelopes window.
- Position the Edit Cursor where you wish to start.
- Play the song. As you do so, adjust the on screen control which controls the parameter that you are automating.
- Stop play when finished.
- Right click over the Envelope button for that track and select **Automation Read**.
- Play the song. Listen and look!

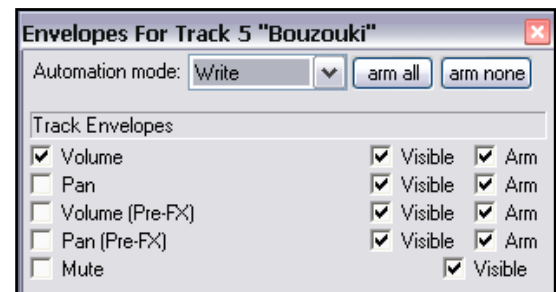


Automation Write Example

1. Open your file **All Through the Night.RPP**. Save it as **All Through the Night AUTO.RPP**. We are going to add an automation envelope to the Bouzouki track to fade this track up a little in the passage between the first and second verses of this song.
2. Use your mouse to increase the height of the Bouzouki track. This isn't absolutely necessary, but makes it easier to see what you are doing.



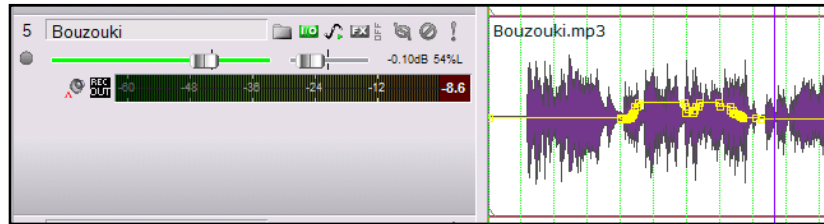
3. Position the Edit Cursor just before the end of the first vocal passage (see above).
4. Now click on the **Envelopes** button for the Bouzouki Track. Select **Volume** and make it both **Visible** and **Armed**. Select the automation mode **Write** for this track (see right).
5. Close the Envelopes window. Notice that the Volume fader for this track is now coloured red. The Envelope button displays a red dot.



6. Play the song.
7. As the instrumental passage starts, use your mouse to raise the fader for the Bouzouki Volume by about a decibel. Hold it there, then at the end of the instrumental break lower the fader to its original position. Stop play.

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- Right click over the Envelope button for the Bouzouki track and choose **Automation Mode: Read** from the context menu.
- The fader for the Volume control from this track will now be green, and your automation envelope should be clearly visible (see right).
- Play the song. The volume fader for your bouzouki will automatically move up and then down in accordance with the movements that you recorded.
- Press **Ctrl S** to save this file.



Note: It is important to understand that you do not need to switch to Automation Read Mode in order for the automation to take effect. You only need to do this if you wish to see the effect of the automation through the on-screen movement of the faders when the track is played. You'll find a more detailed explanation of the different automation modes a little later in this section.

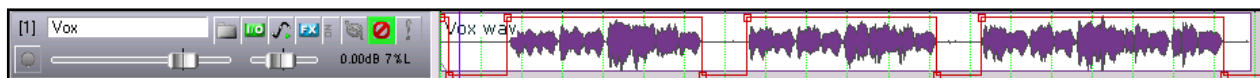
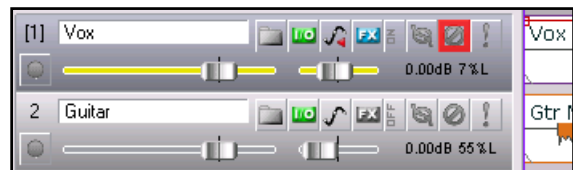
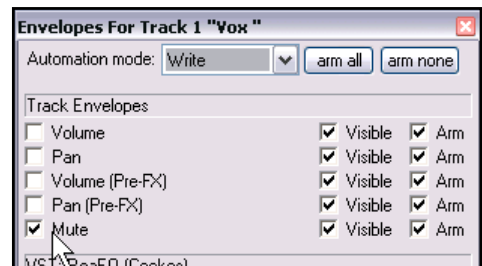
Modifying the Envelope

It's very likely that you won't get the exact settings for your automated faders 100% correct first time. If this happens, you have two ways of fixing the problem. You can either use Automation **Touch** mode to write changes to your envelope, or (probably easier) edit the envelope by hand.

13.6 Writing Mute Automation

One rather special way of using automation is in conjunction with a track's **Mute** button to automatically mute unwanted passages of a track. The procedure for doing this is outlined below:

- Click on the track's **Envelopes/Automation** button to display the Envelopes window.
- Select the **Mute** envelope and set the required mode to **Write** (see right). Then close the Envelopes window.
- Both the Envelopes/Automation button and the Mute button will both now be displayed differently, to indicate that they are armed. Exactly how they will appear will depend on which colour scheme you are using. The example shown here uses the **Classic** colour theme. Notice (right) how these items are displayed in Track 1 (armed) compared to Track 2 (not armed).
- Now play the track. As you do so, click on the track's Mute button at the start and end of any passages that you require to be muted.
- When finished, stop the playback. Right click over the Envelope/Automation button and set the Automation Mode for this track to either Trim/Read or Read, as you prefer.

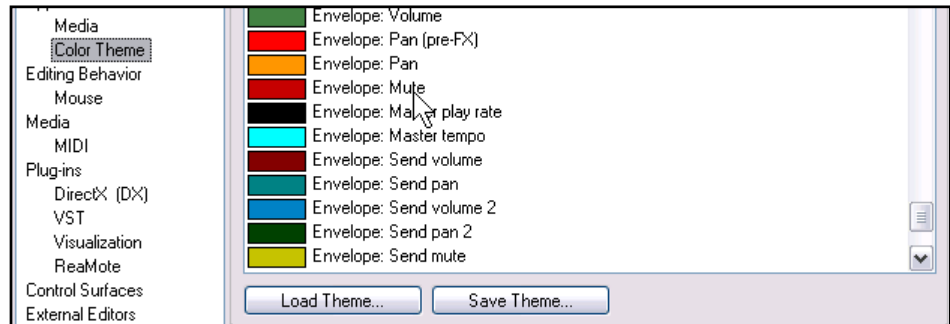


In the example shown above, **Read** mode has been selected. When the track is played back, those passages selected for muting will be muted, and the appearance of the Mute button changes for the duration of those passages.

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13.7 Changing Envelope Colours

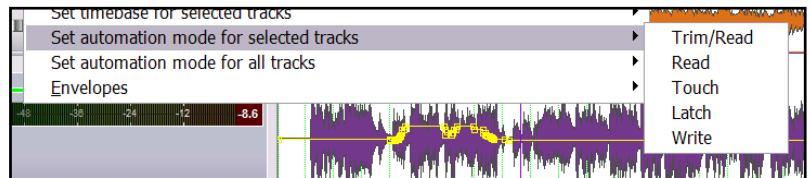
The whole topic of customising colours in REAPER will be dealt with in a later section (Section 15), but for now it's worth noticing that sometimes when you create an automation envelope the envelope colour might clash with a track's colour or media peaks colour.



One way to deal with this is to use the **Options, Preferences, Appearance, Color Theme** settings page to modify the colours of any type of envelope. If you do this, don't forget to use the **Save Theme** button to save your changes.

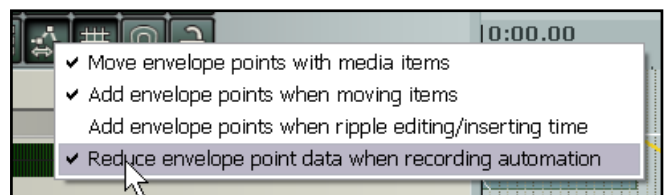
13.8 Automation Modes

Automation mode can be set as already shown from the track pane. Also this can be done, for all tracks or on a track by track basis, from the **Track** menu. This enables you, for example, to write automation to one track at the same time as reading (playing back) previously recorded automation on another track or tracks.



Automation Mode	Description
Trim/Read	Any existing envelopes are applied, but the controls do not move. Trim/Read mode might not look very spectacular, but it does bring you a useful benefit. In this mode, envelopes are applied but you can also use a track's controls in trim mode. For example, adjusting the track's Volume fader in this mode will essentially raise or lower the whole Volume automation envelope for that track.
Read	Applies envelopes and moves controls for armed items, but does not write or remember any changes that you make to them.
Touch	This is similar to Latch, but stops making changes to envelope points when you stop adjusting them.
Latch	Writes and remembers any changes that you make to settings, and creates new points to track envelopes. Changes commence when you first adjust a setting, and continue to be remembered until playback stops.
Write	Writes and remembers current settings as edit points along with any changes that you make to settings for armed items as soon as playback starts. <i>In this mode, previously written envelopes for armed items will be over written.</i>

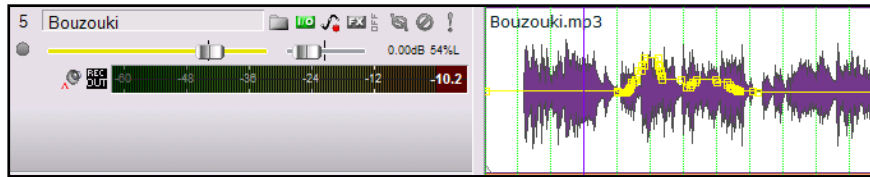
Note: If you find that when you record (write) your automation, REAPER is creating too many points and with a greater precision than you require, you can right click over the **Envelope Button** on the toolbar and select the option to **Reduce envelope point data when recording automation**.



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Example

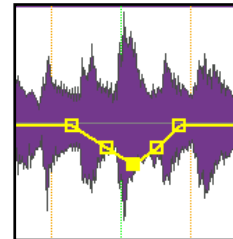
1. Display the Envelopes window for the Bouzouki track and set automation mode to **Write**. Make sure that your Bouzouki track's Volume envelope is selected, visible and armed. Close the Envelopes window.
2. Position your edit cursor just before the end of the first vocal passage, where you previously began recording automation.
3. Press **Play**. Notice that immediately your automation envelope is overwritten with the current level of the volume fader.
4. Stop play, then use **Ctrl Z** to undo this, restoring your envelope to its previous state. You would normally choose **Write** mode when you wish to over write an existing envelope, or part of an existing envelope.
5. Display the Envelopes window for the Bouzouki track and set automation mode to **Touch**. Make sure that your Bouzouki track is selected, visible and armed, Close the Envelopes window.
6. Press Play. Notice that your existing automation curve is not changed until
7. a few second into the break, use your mouse to gently raise the volume of this track just a little for a second or two, then lower it back down again. Press **Stop**.
8. Notice that your automation curve has been modified, similar to that shown above.
9. Change the automation status for this track to **Read** and save the file.



13.9 Manually Adjusting Envelopes

As an alternative to using automation to define and shape your envelopes, you can use your mouse. This is especially useful, for example, when you can see from observing the waveform that there is a peak that needs adjusting.

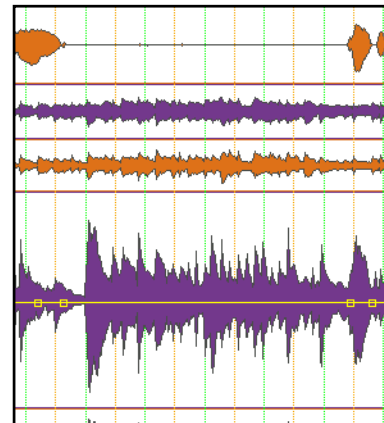
In the example that follows, you will use the mouse to raise the volume of your Bouzouki volume envelope a little for the duration of the short instrumental break that occurs between the second and third verses.



This example assumes that the default mouse editing behaviour settings are as shown above.

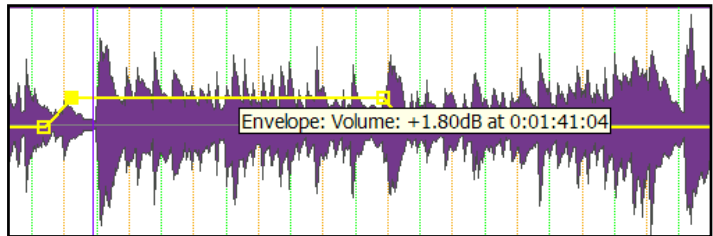
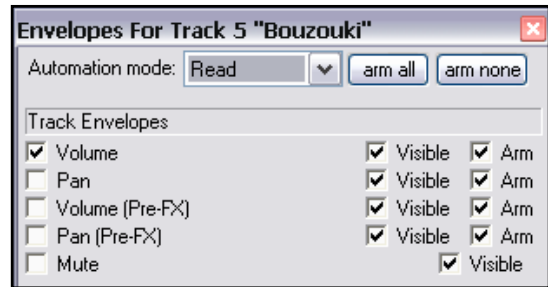
Example

12. Hover your mouse over the envelope, just before the start of the second instrumental break. This will be at or near 1 min 36 seconds. The mouse will change to a vertical black arrow.
13. Click the mouse on the envelope to create a point.
14. Repeat this three times as shown (right), so that you have two points just before the instrumental break and two points just after it.



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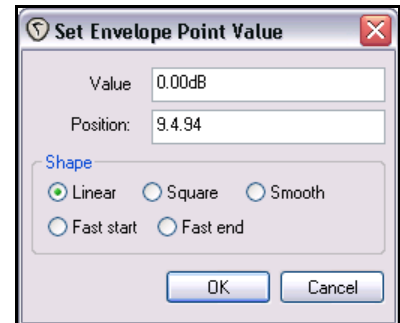
15. Now hold down the **Shift** key. Hover the mouse anywhere between the second and third point. Click and hold down the mouse, then drag upwards to raise the volume of this envelope a little, as shown in the second illustration.
16. Save this file.
17. Display the Envelope Window for the track and make sure that automation mode for this track is set to **Read** and that the **Volume** envelope is selected and set to **Visible** and **Arm**.
18. Play back the song.
19. Notice that the Bouzouki volume will now be faded up for both instrumental passages in this song.



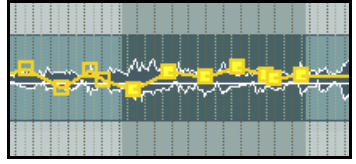
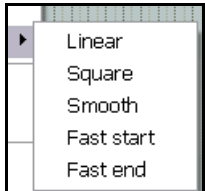
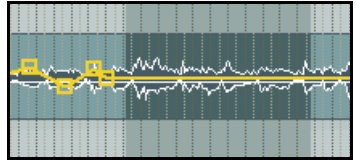
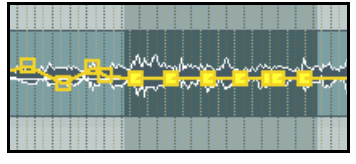
13.10 Some Envelope Editing Techniques

Right clicking over an envelope produces an envelope editing menu. Right clicking over any point on an envelope produces the same menu, but with additional options for editing that particular point. Here is a summary table of your main options.

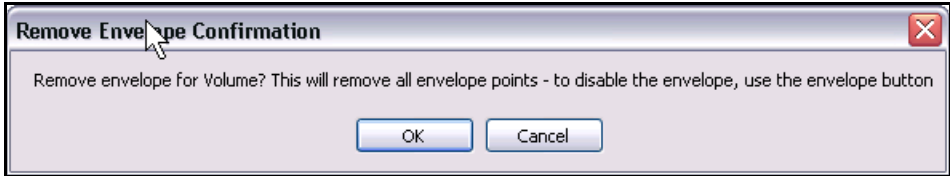
Command	Explanation
Create new point	Creates a new envelope point.
Set point Value	<p>Displays the Set Envelope Point Value dialog box.</p> <p>Can be used to changes the value, position, and/or shape of the current point.</p>
Set point shape	<p>Changes the shape of the current point.</p> <p>The five available shapes are Linear, Square, Smooth, Fast Start, and Fast End. These are explained in more detail shortly.</p>
Select all points	Selects all points in current envelope.
Unselect all points	Unselects all points in current envelope.



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Command	Explanation
Select all points in time selection	<p>If a time selection is currently active, all points on this envelope that fall within the time selection will be selected.</p> 
Copy selected points	<p>Copies all points in current selection into clipboard.</p> <p>Note: To apply a command to an existing selection of envelope points, you should hold Shift while you right click over the envelope.</p> <p>This ensures that the selected points remain selected when the context menu is displayed.</p>
Cut selected points	Cuts all points in current selection into clipboard..
Set shape for all selected points	<p>Allows you to choose a shape for multiple envelope points.</p> <p>The five available shapes are Linear, Square, Smooth, Fast Start, and Fast End. These are explained in more detail shortly</p> 
Delete envelope point	Deletes the envelope point.
Delete selected envelope points	Deletes all envelope points in current selection.
Delete envelope points in time selection	<p>If a time selection is currently active, all points on this envelope that fall within the time selection will be deleted.</p> 
Invert selected points	<p>Causes all selected points to be inverted relative to their neutral position.</p> <p>For example, a point on a Pan envelope set at 50% left would be changed to 50% right. With items such as Volume which use a logarithmic scale, the calculation is less obvious.</p>
Reset select points to zero/center	<p>Sets all selected points back to a neutral position.</p> 
Set envelope default point shape	<p>Sets shape for future points.</p> <p>The five available shapes are Linear, Smooth, Fast Start, Fast End and Square. These are explained in more detail shortly.</p>

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Command	Explanation
Clear envelope	<p>Clears all points on an envelope, restores it to a straight horizontal line.</p> <p>You will be asked to confirm that you really wish to do this.</p>
	
Invert selected points	Inverts selected envelope point(s)

Mouse Tricks with Envelopes

There are a number of techniques and mouse tricks that can be used when you are manipulating and managing envelopes and their nodes.

Method	Description
Hold Ctrl while clicking on envelope points one at a time	Selects multiple envelope points.
Click on any point in an envelope, then press Ctrl A	Selects all points in that envelope.
Click on a point, then use the Right-Click-Drag mouse method to lasso a portion of an envelope. Release mouse.	Select all points within the lasso area.
Hold down Shift while right clicking over any selected point	Displays menu and keeps selection. You can apply a command such as <i>Delete Selected Points</i> to the entire selection.
Click and drag any envelope point in any direction	Moves the envelope point vertically and/or horizontally.
Hold the Alt key while clicking and dragging any envelope point	Allows the envelope point to be moved horizontally only.
Hold both the Ctrl and Alt keys while clicking and dragging any envelope point	Allows the envelope point to be moved vertically only.

Tip: To raise or lower an entire envelope without changing its shape, choose **Select All Points** then hover your mouse over the first point, at the very start of the track. Click, hold and drag up or down

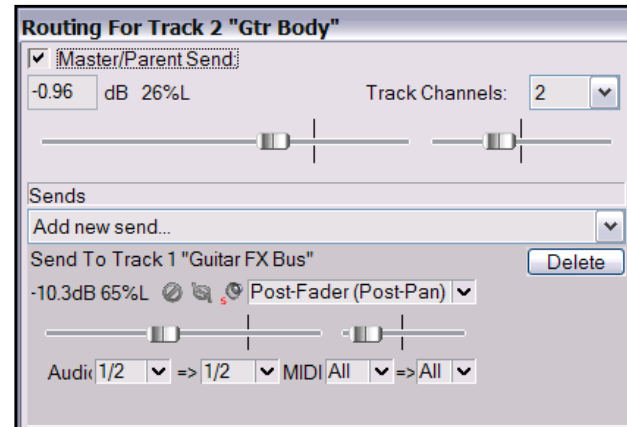
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13.11 Envelopes with Sends

Envelopes can be applied to other controls beside Volume and Pan, such as Sends and FX parameters. In this example, we will create a Send, then use an envelope to control it.

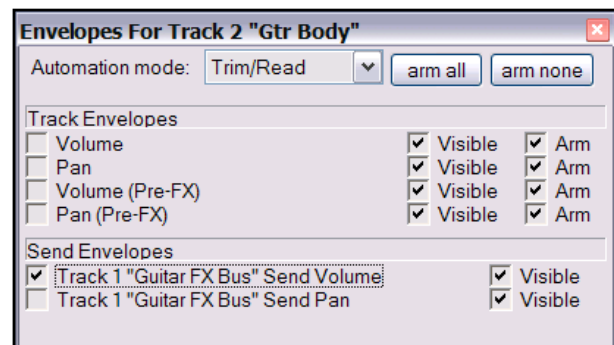
Example

1. First, we are going to create an FX Bus Track, then we will use an envelope to vary the level sent to that FX Bus Track from each of the guitar tracks.
2. Create a new track and name it **Guitar FX Bus**. Display the FX Chain for this track, and add the FX JS Guitar/chorus. Close the FX window.
3. Select the track **Gtr Body** and display the **I/O** routing for this track. Specify the Guitar FX Bus as a send and set Send Volume and Pan levels as shown (right).
4. Select the track **Gtr Neck** and display the **I/O** routing for this track. Specify the Guitar FX Bus as a send and set Send Volume to –10dB and Pan to 65% Right.
5. Now display the Envelopes window for the **Gtr Body** Track.



Notice that envelopes are now available for your sends. Make sure that **Guitar FX Bus Send Volume** is selected and visible.

6. Close this window. An envelope should now be visible on the **Gtr Body** track. Notice that this envelope has automatically reset the Volume send level to 0dB.
7. Right click over the envelope and choose **Select All Points**. Place the mouse over the point at the very start of the envelope, click and drag down until the envelope is set to about –15dB.
8. We are now going to increase the chorus effect, starting just before the second verse.
9. Add a point at about the 60 second mark.
10. Add another point at about 1 minute 18 secs.
11. Place the mouse over this last point. Click hold and drag up until the point is set to about –5dB. Release the mouse.
12. Set automation mode for this track to **Read**.
13. Play the song. If you think the Chorus effect is too much, hover the mouse over the envelope, round about 1 minute 30 secs, hold down **Shift**, then click, hold and drag the envelope back down a little.
14. Now repeat steps 5 to 13 for the track **Gtr Neck**.
15. Don't forget to save the file.



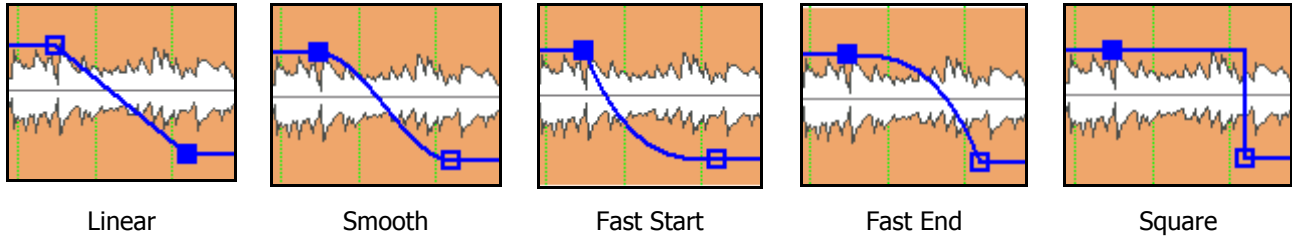
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13.12 Envelope Shapes

Envelope shapes can any of five shapes – **Linear**, **Square**, **Smooth**, **Fast Start**, or **Fast End**.

To change the shape of an existing curve, right click over the envelope point, then choose **Set Point Shape**, then the required shape from the menu.

The table below illustrates the different shapes:



Shapes other than Square are usually best used for graduated parameters, such as volume and pan. Square envelopes are best used for items with on/off parameters (such as bypass or mute), to ensure an exact transition at the required point.

13.13 Using Envelopes with FX Parameters

Finally in this section, we will see how envelopes can be applied to track FX parameters. For example, you can use automation envelopes to add a touch more compression to a drum track here, or a touch more warmth to a vocal there.

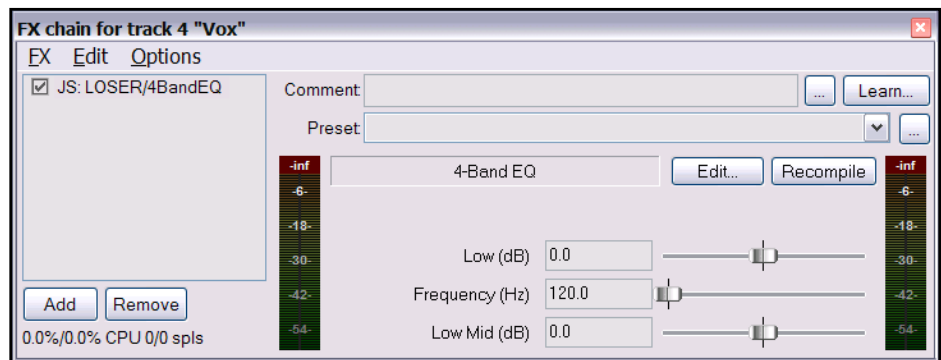
Most FX can be automated in this way, but be warned that with some earlier ones this just isn't possible. In these cases, the development of the FX predates automation techniques.

Example

Open the **FX Chain** window for the track **Vox**.

Add the **JS LOSER/4BandEQ** to this chain. Set the first Frequency level to 120 (see below).

1. Solo the Vox track and play the song. As you do so, hold down the Alt key as you slowly and gently increase the Low volume level (the top fader above). Notice how the sound changes and becomes warmer. Release the mouse, and the level will snap back to 0.0.

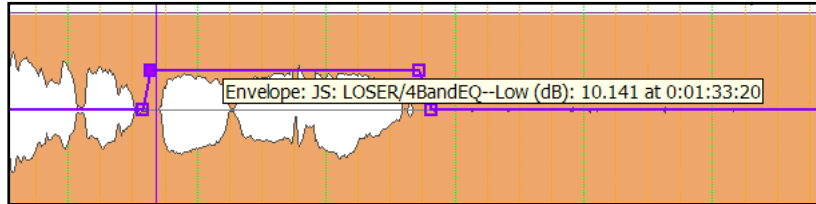


2. We are going to add an automation envelope to increase this level for the phrase *All Through The Night* at the end of the first vocal passage. This will warm up that phrase, but also make it louder. Therefore, we will need to add another envelope to lower volume to compensate.

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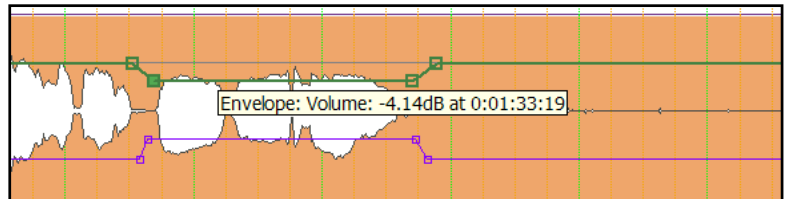
3. Adjust the horizontal and vertical zooms of the Vox track, so that you can clearly see the area that you are working with.
4. Display the **Envelopes** window for the Vox track. Notice that envelopes are now available, if required, for any of our EQ parameters.
5. Make sure that the first item – **low** – is selected and set to visible and armed. Close the window, and the envelope should be visible on your track.
6. Starting around the 1 min 33 sec mark, add points as shown below, then raise the level between points 2 and 3 to about +9dB.

7. Display the **Envelopes** window again for the **Vox** track. Make sure that **Volume** is selected, visible and armed. Set Automation Mode to **Read**. Close this window.



8. Add points to the Volume envelope as shown below.
9. Now play the song with the Vox track set to Solo. If necessary, raise or lower the level of the volume envelope for that passage shown (below) as set to -4.30dB until it sounds about right.
10. Now unsolo the track and play the song again. You might need to make some further minor adjustments to your envelopes.

11. Notice when you playback that the faders for Vox Volume in your Track Control Panel, and for Low in its FX Bin (JS LOSER/4BandEQ) will automatically move themselves up and down.



Tip: The keyboard shortcuts **V** and **P** can be used as toggles to show and hide the Volume and Pan envelopes.

Now you try it! After working through this section, your head should be overflowing with ideas of how you can use envelopes to produce a better sound in your REAPER projects.

Working with the file **All Through the Night AUTO.RPP**, let your imagination rip and explore some of the things that you think you might be able to do with envelopes.

13.14 Creating Envelopes from the FX Parameter Window

A handy feature of REAPER is that if you are using it with a control surface, such as a Behringer BCR2000, you can create envelopes on the fly to automate your FX parameters, and then use one of the Control Surface rotaries, faders or buttons (as appropriate) to automate your FX parameter.

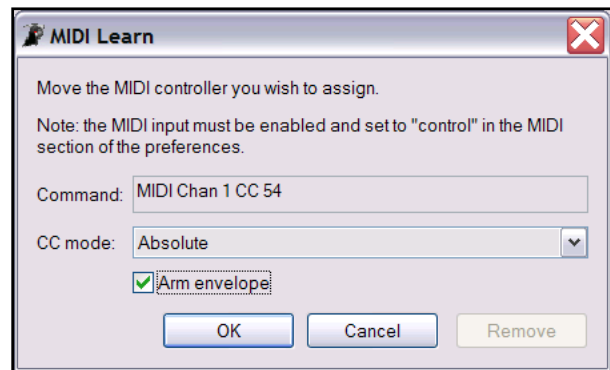
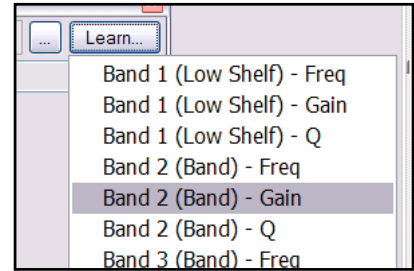
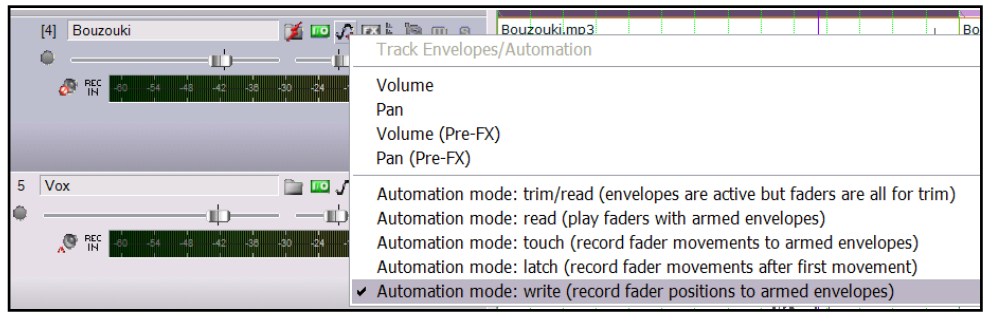
Of course, the exact steps involved will depend on what control surface you are using, and how that device is set up, but in overview the sequence is outlined below.

Of course, the example assumes that the Control Surface has already been installed and is ready to use with REAPER. It needs to be enabled as a Control Surface, as shown in Section 4.8.

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Example

1. Select the track containing the FX that you wish to automate, and set the automation status for that track to **Write**.
2. Display the **FX Window** for this track.
3. Insert the required FX – in this example, we will use **Cockos ReaEQ**.
4. Click on the **Learn** button within the FX Dialog Box, and select the parameter that you wish to automate. In this example, we will use **Band 2 Gain**.
5. When the **MIDI Learn** dialog box is displayed, twiddle the required control on the control surface (in this example you would use a rotary or a fader rather than a button), and select the required CC mode.
6. Click in the **Arm Envelope** box to tick it (as shown right) then click on **OK**.
7. Notice that a new envelope will now have appeared on your track.
8. Now play the song. As you do so, use the control surface rotary or fader to adjust the value of the armed parameter. As you make your adjustments, the envelope will be drawn. Of course, you can later edit the envelope if you wish.



13.15 Automating FX Parameters on the Fly

If you turn on the option to automatically add and arm envelopes when parameters are tweaked in write mode (see section above), then REAPER will automatically create automation envelopes for you as you tweak the parameter settings during playback.

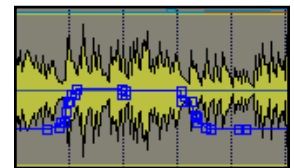
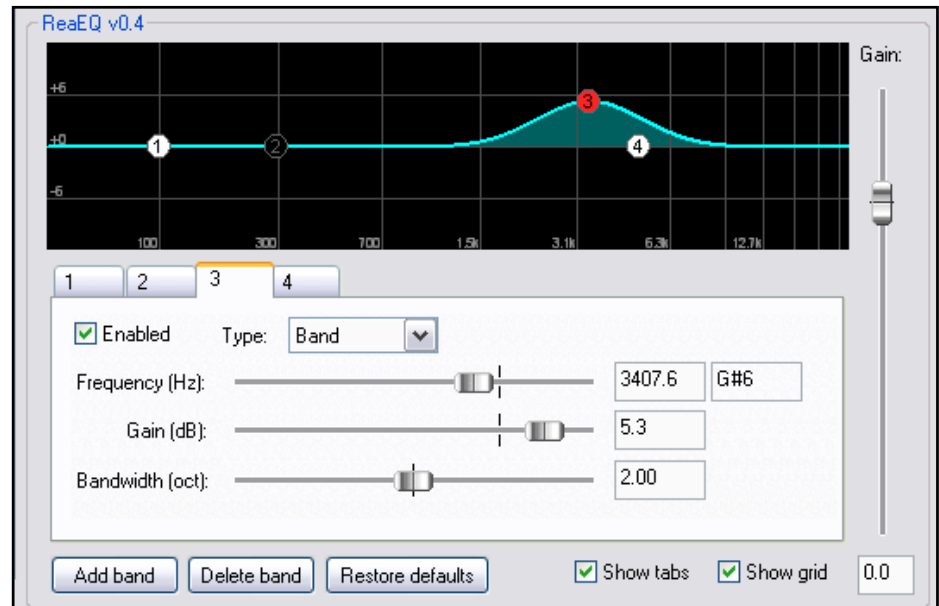
Example

In this example, we will automatically create an envelopes to apply an EQ boost to a track to give it more presence for one part of the song. This example uses the same file, **All Through the Night AUTO.RPP**, that is used in the other examples throughout this section.

1. Select the **Bouzouki** track. We are going to compress this instrument a little and raise its volume during the first instrumental break.
2. Open the FX Window for this track and insert **ReaEQ** into the FX Chain.
3. Select **Band 3**. Set the **Freq** to about **3400**. Leave all other settings at their defaults for now.
4. Position the play cursor just before the first instrumental break (this should be around the 48 second mark).

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- Press **Ctrl P** to display the Preferences window, navigate to **Editing Behaviour** and make sure that **Automatically add/arm envelopes when tweaking...** is selected. Click **OK**.
- Right click over the Envelope button for the Bouzouki track and set automation mode for this track to **Write**.
- Play the song. As it gets to the break, raise the **Gain** fader for Band 3 by about 5dB (see right).
- After the instrumental break, return this fader to its original position.
- Stop playback. The play cursor will return to its starting point.
- You should now be able to see that an envelope has been drawn for your compressor threshold.
- Right click over this track's envelope button and set automation mode for this track to **Read**. Your track should now show this envelope, and apply it as the track is played.
- Save the file.



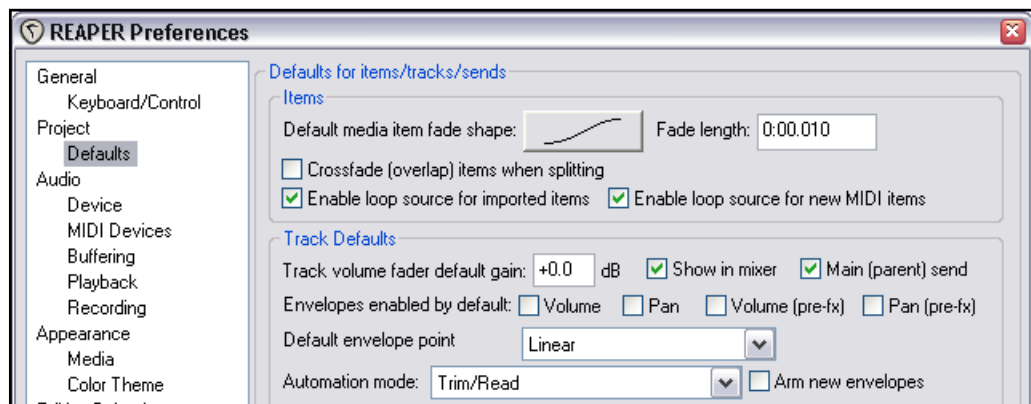
Note: It is important when you finish recording your automation envelopes in this way that you change Automation mode from Write, otherwise every parameter you tweak will create and/or modify an envelope, whether you want it to or not.

13.16 Automation and Envelope Defaults

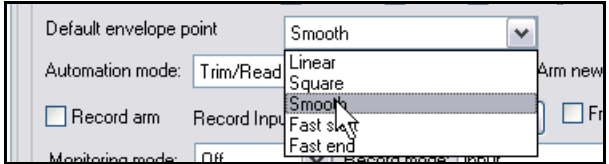
Before exploring any more of REAPER's automation features, it's worth taking note of where your default Automation settings are stored.

They are in the **Preferences** window, on the **Project Defaults** page, shown on the right.

The main options are explained in the table below.



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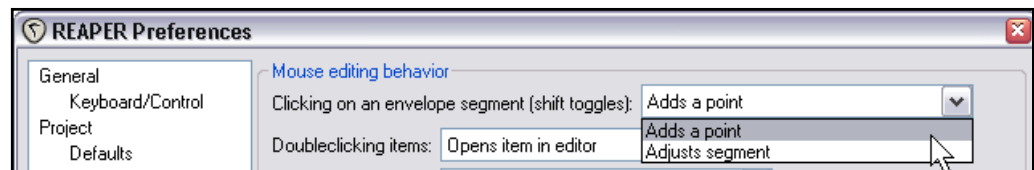
Option	Description
Envelopes enabled by default	If you tick any items here (for example, Volume or Pan) and then click Apply , the specified envelopes will be automatically created, enabled and displayed for each new track that you subsequently create.
Default envelope point	<p>This option enables you to specify your preferred default shape for each new envelope point subsequently created.</p> 
Automation Mode	<p>This option sets the default automation mode that will be applied for all new tracks subsequently created.</p> <p>The available modes are Trim/Read, Read, Touch, Write and Latch. These are all explained in detail earlier in this section.</p>
Arm new envelopes	This option determines whether or not new envelopes are armed by default.

13.17 Mouse Click Envelope Preferences

Defaults for determining how your mouse behaves when you click on an existing envelope segment are stored on the **Editing Behaviour, Mouse** page.

The two options are:

- Adds a point
- Adjusts segment



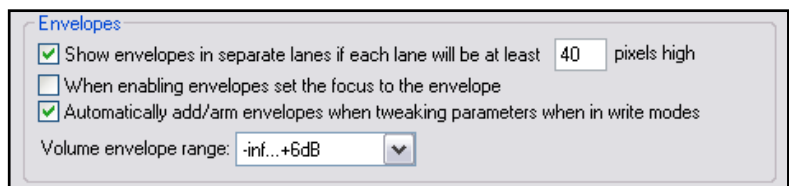
By default, click is set to add a point, Shift click is set to adjust segment.

If you select **Adjust segment** as your default mouse click behaviour, then these are reversed.

13.18 Other Envelope Preferences

The **Editing Behaviour** page of the **REAPER Preferences** window includes a number of options that concern envelopes. These include:

- To show envelopes in separate lanes. This helps prevent one envelope from being hidden behind another envelope.
- To set focus on the envelope when an envelope is enabled.
- To automatically add and arm



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envelopes when parameters are tweaked in write mode. This effectively allows for automation on the fly, and will be covered in the next section.

- To specify your required envelope range for volume envelopes.

In addition to these, the fourth tool in the second row of the REAPER toolbar (shown right) can be used to determine whether or not envelope points are moved along with media items. This will be examined in more detail below.



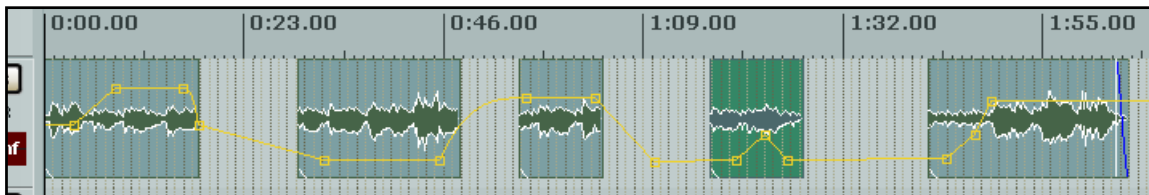
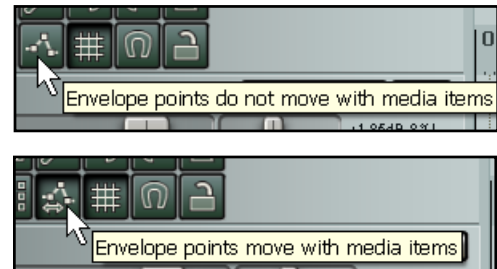
13.19 Moving Envelope Points With Media Items

The Envelope button on the REAPER toolbar is used to determine whether or not you wish to have envelope points moved when you move media items. The two states for this button (using the default colour scheme) are shown here.

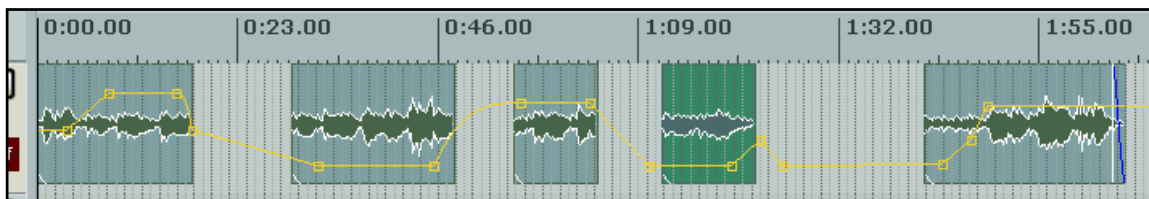
The series of three illustrations below demonstrate the result of moving a media item, first with this option turned off and secondly with it turned on.

In this example, the track shown consists of five media items. For convenience, we will be referring to these (from left to right) as items 1, 2, 3, 4 and 5. The track also includes one envelope, a Volume envelope.

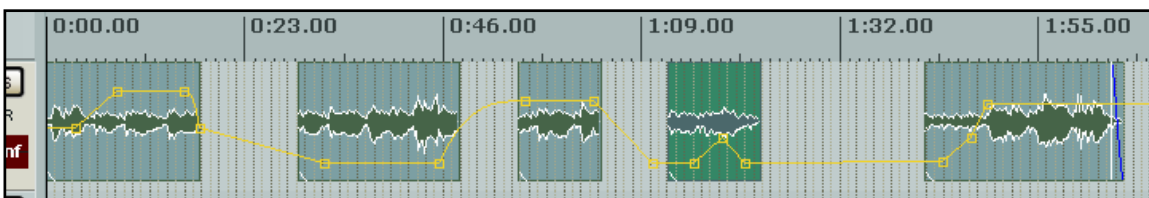
First, notice the position of the selected Media Item, Item 4, together with its envelope nodes.



Now observe what happens when we reposition this media item to the left with the option selected not to move envelope points with media items.



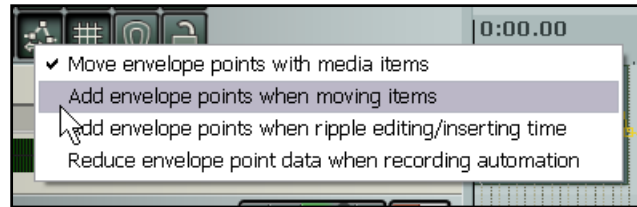
Notice that the envelope points remain where they were. This will of course affect the volume of Media Item 4. If this is what we want to happen, fine. But let's suppose that we wanted to keep the volume of that media item at the settings determined by the envelope. This is what happens when we undo and move the envelope again, this time with the option to move envelope points with the media item enabled.



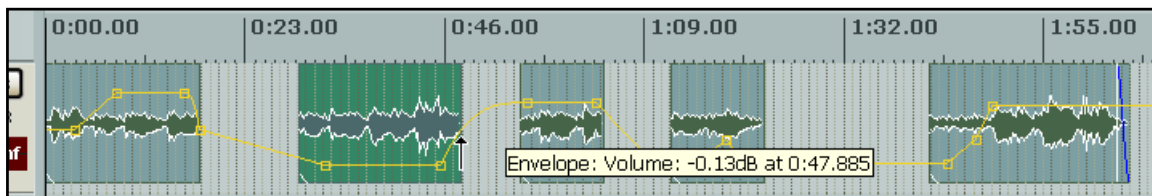
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This time you can see that the envelope points have been moved along with the media item, so that the item will still play back at its original volume.

Now let's take a rather more complicated example. If you right click over the Envelope button, you will see that there are a number of other options available to you.

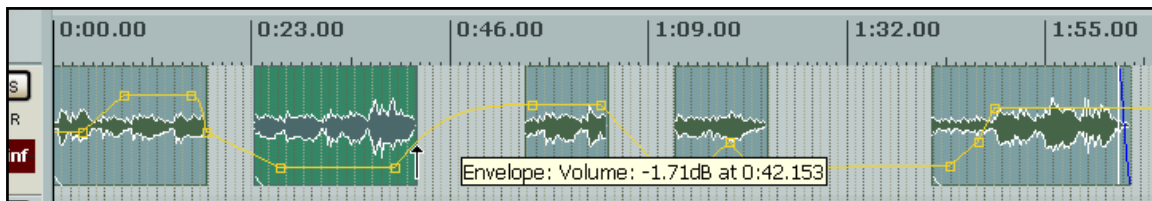


The options to **Add envelope points when moving items** and **Add envelope points when ripple editing/inserting items** can be used to prevent unexpected changes being made to your envelope curves as can sometimes occur when you move media items under certain circumstances. The underlying principle for both these options is the same. Let's look at an example.

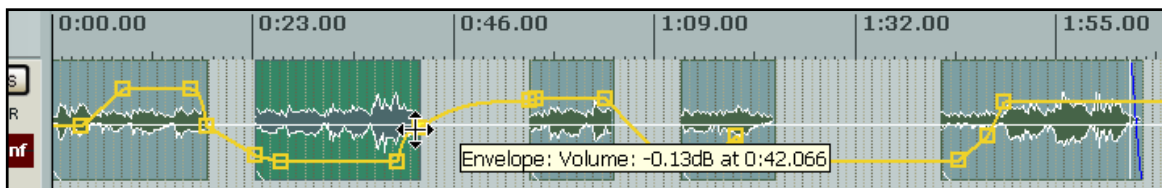


Notice that at the 0:47.885 second mark, where the volume envelope exits the very end of Media Item 2, the envelope determines that the volume for this track will be -0.13 dB.

Now let's see what happens when we move this item left with **Move envelope points with media items** enabled on the Envelope button right-click menu, but the other menu options disabled.



The next screen shot shows Media Item 2, after it is moved so that the item now ends at 0:42.153 seconds. Because of the curve of the envelope at the end of the item, the volume at this point is now -1.71 dB. Let us suppose, however, that we wish to lock that volume at its original setting of -0.13 dB. Of course, we could manually add a point before moving the item, but in circumstances where you are working with many items this would be more than a little bothersome. Instead, we can undo and enable the option **Add envelope points when moving items** before having another go.



This time, envelope points are automatically added at the start and finish of Media Item 2, to prevent any unwanted changes to the volume of that media item.

The option to **Add envelope points when ripple editing/inserting time** will ensure that REAPER will behave in the same way as this when you use ripple editing or insert time selections into an existing media item.

The final option, to **Reduce envelope point data when recording automation** was discussed earlier in this section when we examined automation.

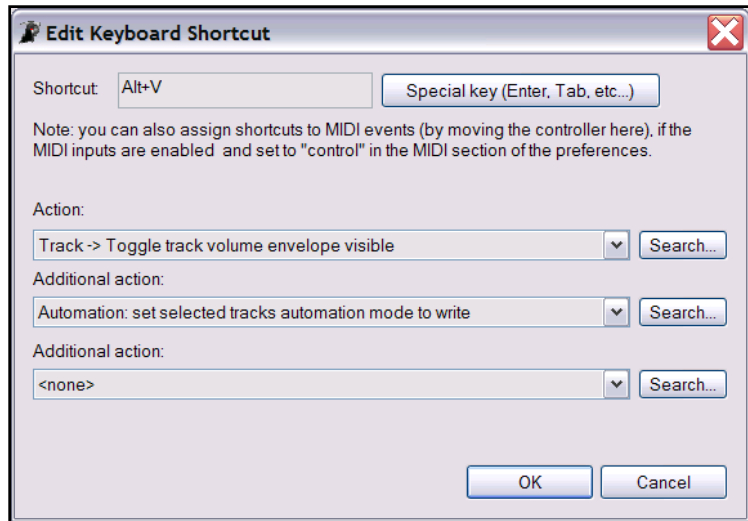
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13.20 Automating Automation

Don't forget that REAPER's Keyboard Shortcut capabilities really do put a lot of power and control at your fingertips. For example, if there's an automation task or sequence of tasks that you use frequently, you can allocate a keyboard shortcut to that sequence.

For example, suppose that you often need for the current track to display and select, ready for automation, a volume envelope, and then select Write automation mode for that track.

You could use the **Options, Preferences** command, select the **Keyboard Control** window to create a key-binding similar to that shown.



13.21 Thinking Outside the Envelope

You've seen how powerful REAPER's envelopes can be as an automation tool, but that's all they are – a tool. REAPER's flexible options mean that the envelope isn't necessarily the best tool for the job. It pays to get to know REAPER's other features and to learn how to use each to its best advantage.

Example

Take a look at the track shown here.

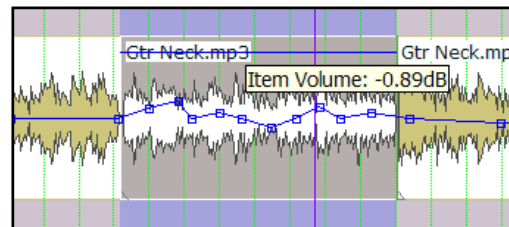
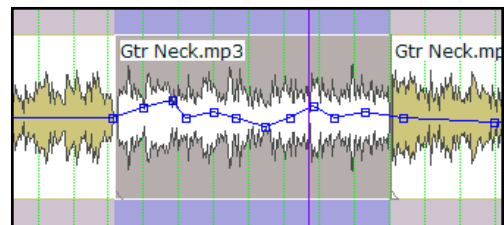
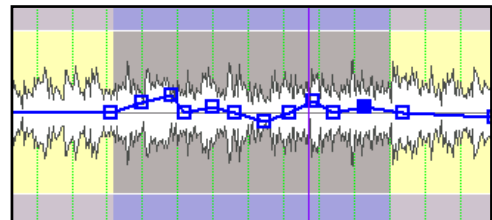
A Volume envelope has already been added to this track. But you now decide that you want to raise the volume of that passage shown as selected on the timeline.

Of course, you could add extra points to the envelope, select a range of points and manually adjust the envelope up and down. But this can be quite a tricky process.

You might find it simpler and quicker to create a new item from the selected area and then adjust the volume on that item.

Here's how to do this:

1. With the area on the timeline still selected, click on the media item to select it (see right).
2. Right click over the media item, then choose **Split item at time selection**. This creates a separate media item from your selection.
3. If you wish, you can now either press **F2** to display the **Item Properties** dialog box, then use the Volume Fader (shown below) for this item to adjust the volume for this passage.
4. However, perhaps a quicker and easier way is to position your mouse on the top border of the media item you have just split (so the mouse changes to a vertical double-headed arrow), then click and drag down to adjust the volume fader for this item (see above).

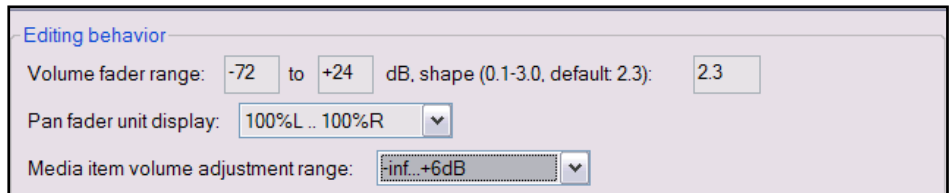


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Of course, you can repeat this process at any time and as often as you need, to “tweak” your Volume setting.

If you wish, when you’re satisfied with your changes, you can select all media items in this track (by double clicking on the track number in the Track Control Panel), then right click over the selection and choose **Glue selected items** to join them all together again. There’s obviously no restriction on the number of times you can split and glue.

Tip: To display the Volume Fader envelope for all media items more clearly, choose the **Options, Preferences** command, select the **Editing Behaviour** page, and change the setting for **Media Item Volume Adjustment Range** to **–inf to +6dB**.

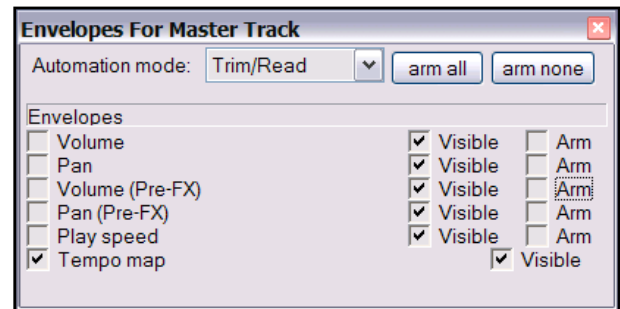


13.22 Using the Tempo Map and Play Speed Envelopes

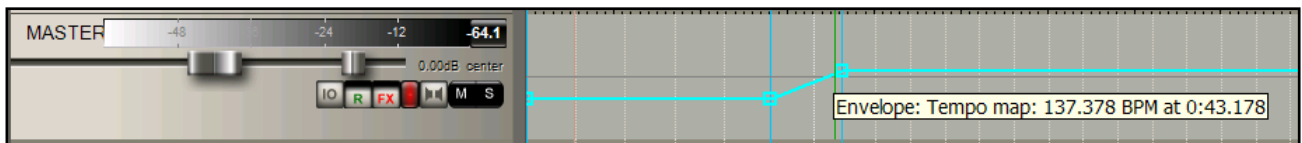
In Section 10, you learnt how to change the Time Signature within a project. Another (and perhaps more intuitive) way of doing this is to use the Tempo Map Envelope.

To display the Tempo Map Envelope in the main REAPER window:

1. Make sure that the Master is displayed – **Ctrl Alt M** toggles this on and off.
2. Click on the Envelopes button in the Track Master. This displays the Envelopes window for the Master. Now tick the item **Tempo Map**.
3. Set the Automation mode for the Master Track to **Read**. Close this window.

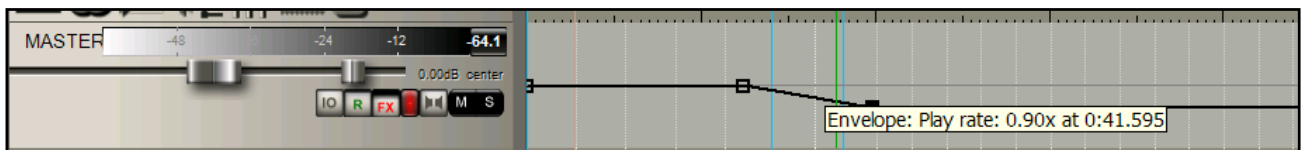


When you make the Tempo Map visible, an envelope is displayed on the Master Track. This envelope can be modified in the same way as any other – you can add points, move them. Delete them, raise them, lower them, etc.



Similarly, you can also add to the Master a Play Speed envelope, which can be used to automatically speed up or slow down the playback of your project. This envelope is applied to all tracks, audio and MIDI. To do this:

1. Click on the Envelopes button in the Track Master. This displays the Envelopes window for the Master. Now tick the item **Play Speed**. Make sure this item is marked as both Visible and Armed.
2. Close this window.



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Notice that you can also apply envelopes for any of the following to the Master Track:

- Volume
- Pan
- Volume Pre FX
- Pan Pre FX
- Any automatable parameters on any FX in the Master Track's FX window.

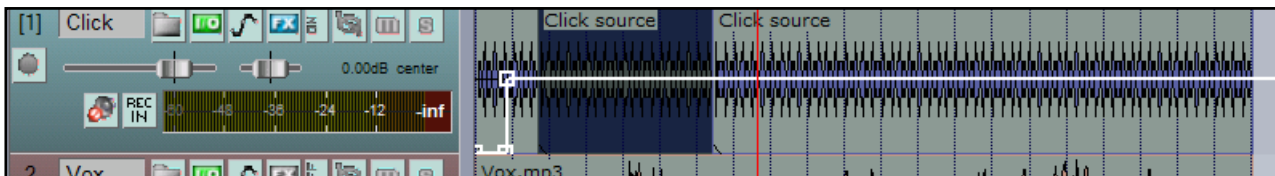
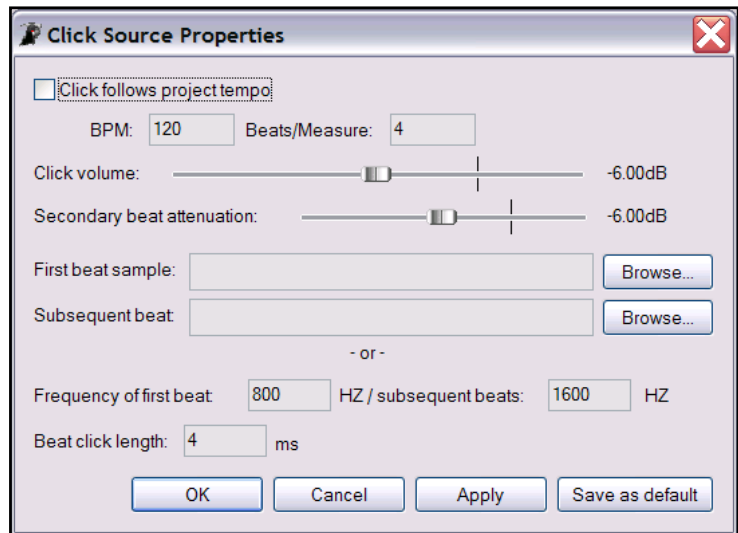
13.23 Automating the Metronome

You can automate the Metronome behaviour – for example, to get it to play only at the exact times that you require. To do this, simply create a new track and use the **Insert, Click Source** to insert a media item into your file.

You can then treat this click track like any other track – for example, add a Volume envelope, mute certain passages, and so on. An example is shown below.

To modify any of the click track properties, right click over the track and choose **Source Properties** from the menu (see illustration, right).

For example, you can change the BPM setting, or use your own sample files to create the beats.

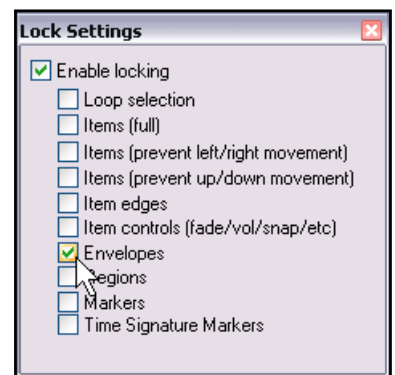


13.24 Locking Envelopes

When you are satisfied that your envelopes have been finalised, you can lock them in order to prevent any accidental changes or deletions from taking place.

Pressing **Shift L** will cause the **Lock Settings** window to be displayed (see right).

You should then select the **Envelopes** option, along with any other aspects that you also require to be locked.



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Notes

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14 Mixing Down and Rendering

14.1 Consolidating and Exporting

You might be collaborating on a project with someone else, or with other people. Perhaps, for example, you want to send your project to a friend who will add some vocal harmonies to your song.

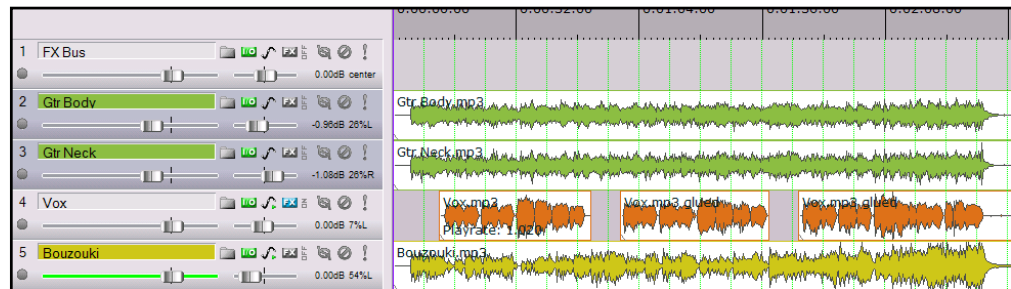
What if that friend lives a long way away? You could send her your .RPP file together with all the media item files, and she could do it there.

But what if she doesn't use REAPER? Perhaps she uses a different software program, or perhaps she doesn't have a DAW herself and will need to use a commercial studio for this purpose.

In this case, it should first be consolidated and exported. Take a look at this example here:

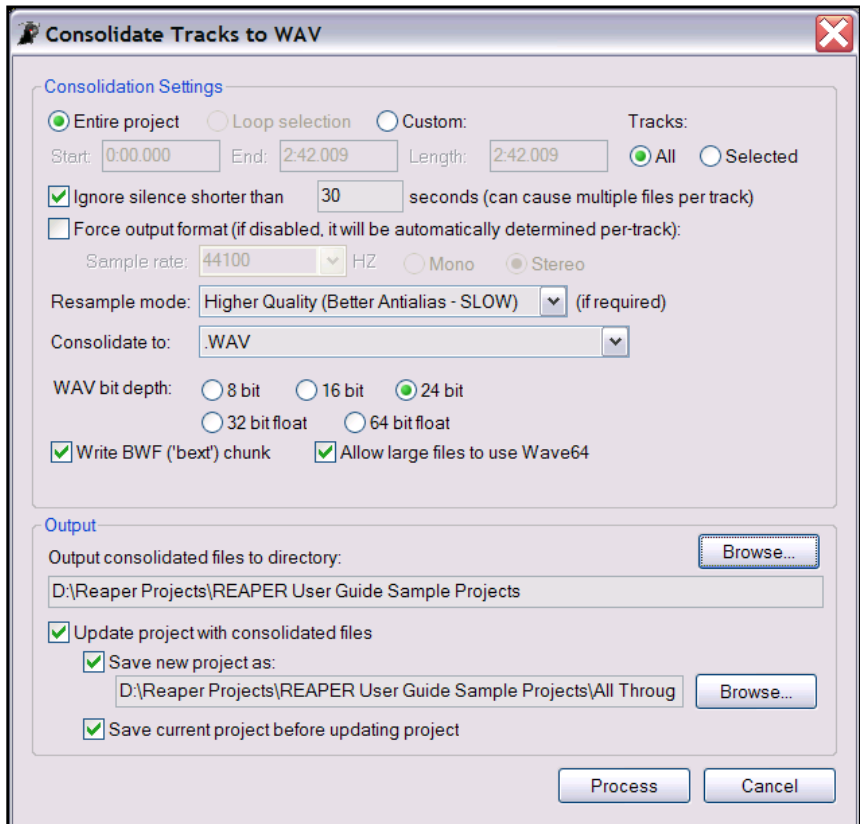
In the example shown here, the Vox track is made up of three separate items, each covering only part of the total song.

If we were to hand over a copy of these media files (six in all) to someone else, then even with a simple recording project like this, it would be quite a job for that person to line everything up.



That's where consolidate and export comes to our rescue. It creates new audio files, one per track, based on the items in the project, the files they refer to, and their position in the project. Once these new files are inserted in another DAW, each starting at zero time, one per track, then everything will be in the right place for further mixing.

1. From the main menu, choose **File, Consolidate/Export Tracks**.
2. Choose either the **Entire Project** or a **Custom** loop selection, then **All** or **Selected Tracks**.
3. Select a **Resample Mode**.
4. Specify required format – WAV, AIFF, FLAC, MP3, OGG Vorbis, Monkey's Audio or WavPack.
5. Select your required

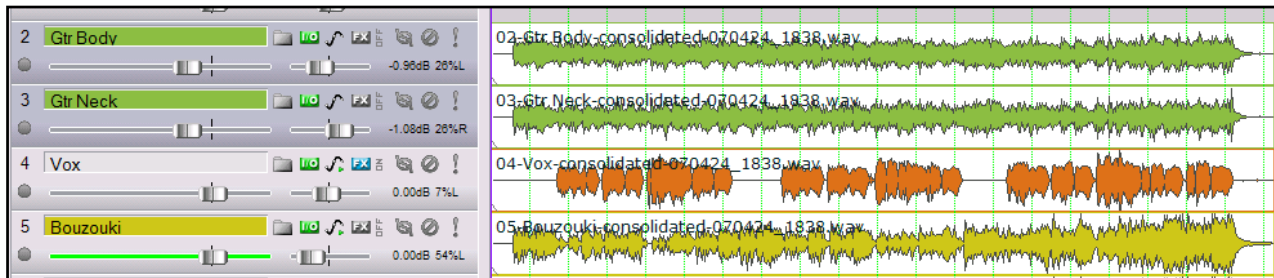


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specifications for your chosen format. For example, for WAV files you need to select a bit depth, for MP3 a mode and quality. If in doubt, speak to the person who will be doing the work.

6. Specify your Output directory (where the files will be written to). Specify whether you wish to update the project with the newly consolidated files.
7. Specify a name for the new project file (or accept the default).

Below is shown how the project file looks after consolidation. It would clearly be an easy task for an audio engineer to import these four media items into any DAW program, then overdub the vocal harmonies.



Note: To consolidate in MP3 format you will need to have a copy of the free Lame encoder file **lame_enc.dll** placed in your **C:\Program Files\REAPER** folder. It will take you only a few moments to use Google to find a suitable download location.

14.2 Rendering A Project

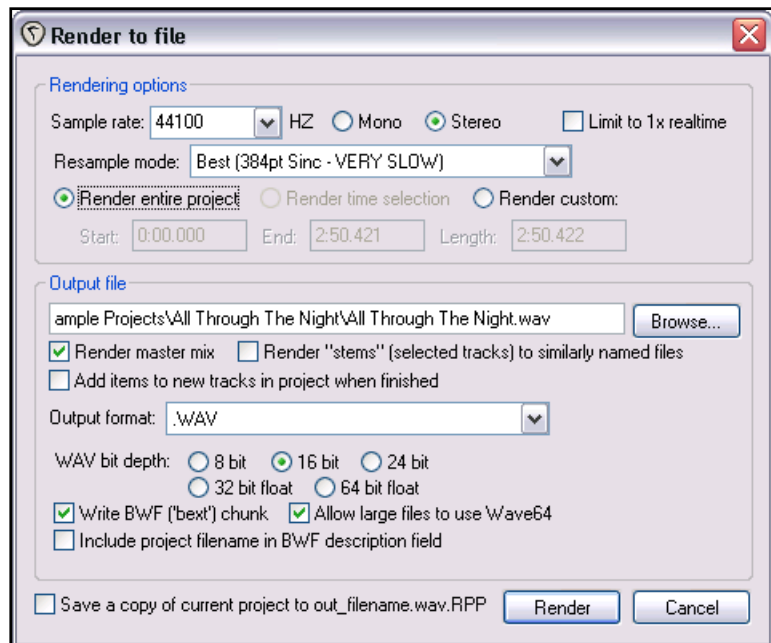
Let's say you've reached the point where you've finished your recording, completed your edits, added all your FX and automation, arranged all your tracks ... and now you're ready to mix down your work to produce an end product.

Usually that end product will be a stereo file. If it's going on to an audio CD, this will be a 16 bit stereo wave file. If it's going on to the web, it will most likely be a stereo MP3 file. But whatever format you're using, your project will ultimately need to be rendered down to one file.

To do this, we use the **File, Render** command.

The dialog box shown on the right shows your various options. Your choices will depend on the ultimate destination of your material.

Some examples are listed on the following page.

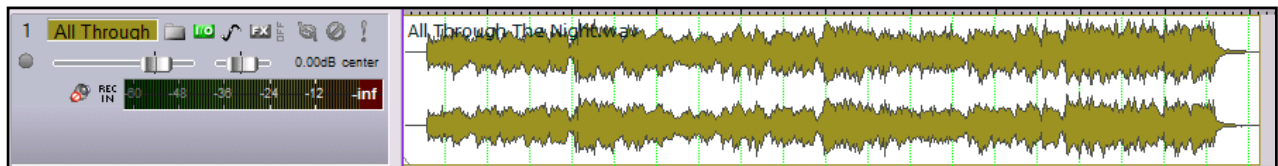


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Project Rendering Examples

Output Destination	Specification
DVD Audio Soundtrack	Sample Rate 48000 HZ, Stereo, Higher Quality WAV format, 24 bit
CD Audio	Sample Rate 44100 HZ, Stereo, Higher Quality WAV format, 16 bit
Web Site / Web Audio	Sample Rate 44100 HZ, Stereo, Higher Quality MP3 format Other options may vary as you trade off files size and download time against audio quality, but a typical selection might be: CBR (Constant Bit Rate) 96 or 128, Joint Stereo, Quality High
Monkey's Audio	Use this format for lossless compression at 16 or 24 bit, sample rate as preferred.
Apple Mac	AIFF Format. Consult the engineer who will be working with the file for advice on preferred settings.
Audio CD Image (Cue/Bin) format	Specifications as for CD Audio. This option can be used to burn your rendered output directly to CD, or to create an image file on your hard drive for use with other CD burning software. You can specify how markers or regions should be used to define tracks. This includes the option only to use markers whose name begins with "#", in which case these become track markers. Further information about how to do this can be found later in this section. .

Below is shown an example of a rendered stereo wave file:

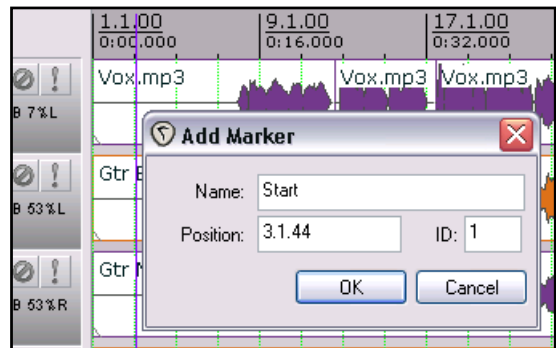


14.3 Rendering a Finished Song

As indicated in the above table, when rendering a finished song you will be likely to make different output format choices depending upon whether your final destination is and audio CD or the web. However, there are a few tips that you may wish to keep in mind which are equally applicable to both.

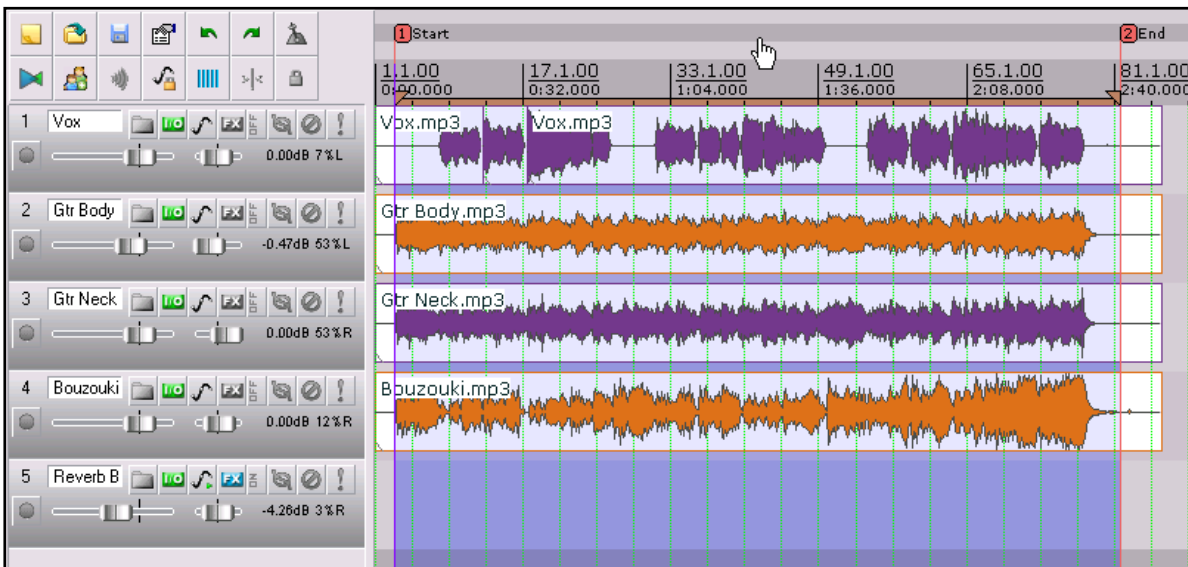
Very often your recording will have a few seconds of silence before the song starts. Usually you will not wish to include this period of silence with your rendered material. Before you render your project, you should follow these steps:

1. Position the play cursor at the point where you actually wish the rendering to commence. Press **Shift M** to create a marker at this point. Name this marker **Start**.

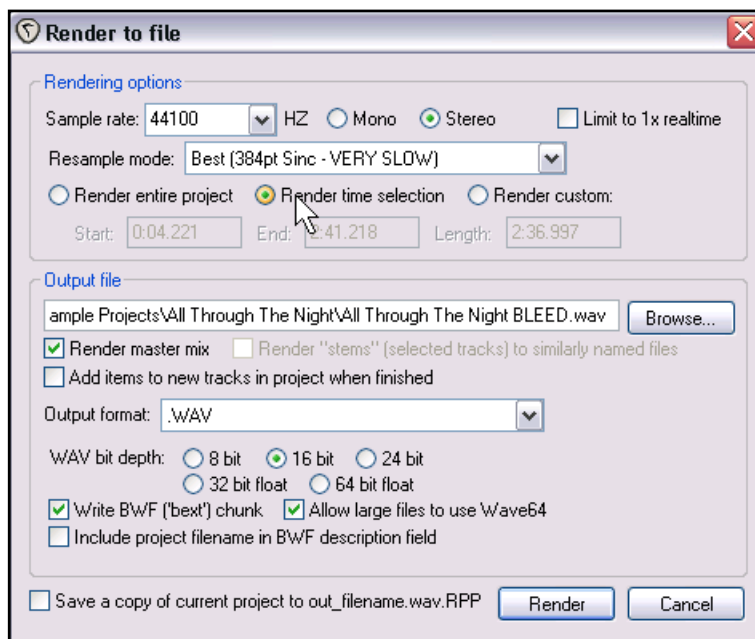


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- Position the play cursor at the point where you wish the rendering to stop. Press **Shift M** to create a marker at this point. Name this marker **End**.
- Double click just above the timeline anywhere between the two markers. This selects the entire area between them.



- Select the required output format and other options as required, but be sure to include the option **Render time selection** (as shown on the right).
- When you are ready, click the **Render** button in this dialog box to create your rendered file.



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14.4 Burning an Audio CD with REAPER

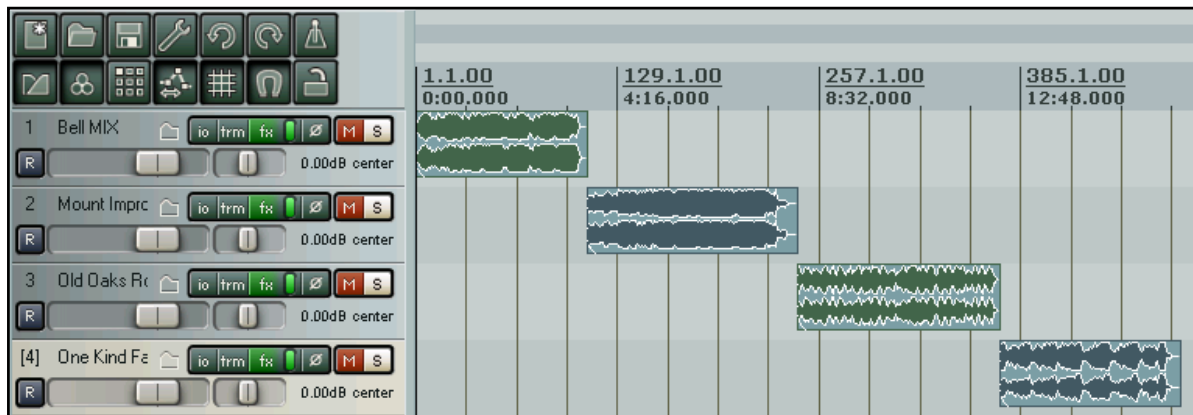
There are, for the most part, two circumstances in which you might wish to burn your material direct to an audio CD.

1. You have recorded a number of songs. Each has been mixed and rendered to its own stereo wave file. You now wish to burn all of these to audio CD, with one track for each song.
2. You have perhaps a live recording comprising one continuous track. You wish to split it up into individual tracks, and then burn to audio CDs.

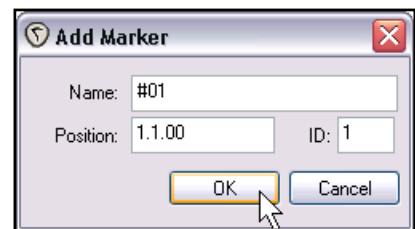
In both cases, the procedure is similar. There are just some slight differences in how you set the project up at the beginning.

Preparing to burn a CD from several mixed files

1. Start REAPER and create a new project file. Press **Ctrl Alt X** to display the **Media Explorer**, then navigate to the folder containing the rendered stereo wave files.
2. Double click in turn on each of the files that you wish to include in your CD program. REAPER will add each one to your project, as shown below.



3. Notice that each media item is placed so as to begin immediately after the other, with no gap. It is not necessary to move any of these in order to create gaps on your CD. You will later be able to tell REAPER to do this automatically for you.
4. You will now need to insert a marker to indicate where each track is to start. To do this ...
5. First, make sure that Snapping is disabled. Place the cursor at the very beginning of your project. Press **Shift M** to create and edit a marker at this point. Make sure the marker name begins with a **#** (as shown on the right).
6. Now move the cursor to the start of the next song. Again add a marker, and again make sure that the marker name begins with a **#**.
7. Repeat this until you have created a marker at the start of each song, as shown below:

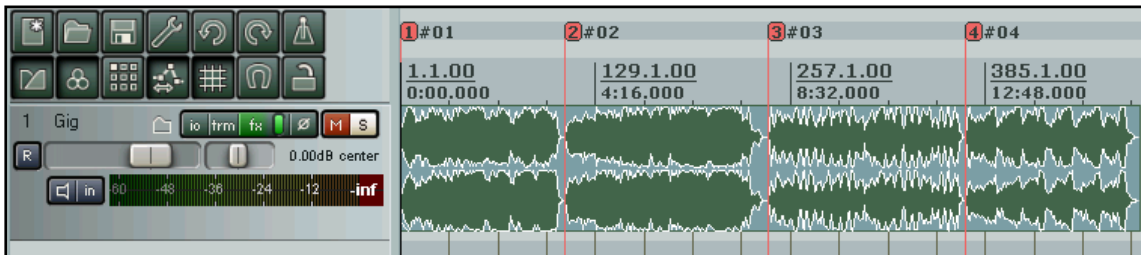
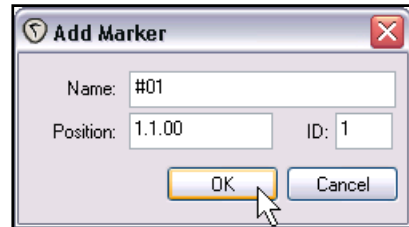


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8. Save the Project File.
9. Now follow the instructions below for **Burning the CD**.

Preparing to burn a CD from one continuous recording

1. If the recording was made in REAPER, open the project file. Otherwise, create a new project file and use Media Explorer to import the recording, using the method explained before.
2. It is *not* necessary to split up the media item. REAPER will take care of this when it burns the CD. However, you will need to indicate where you want each track on the CD to start.
3. First, make sure that Snapping is disabled. Place the cursor at the very beginning of your project. Press **Shift M** to create and edit a marker at this point. Make sure the marker name begins with a **#** (as shown on the right).
4. Now move the cursor to the start of the next song. Again add a marker, and again make sure that the marker name begins with a **#**.
5. Repeat this until you have created a marker at the start of each song, as shown below:



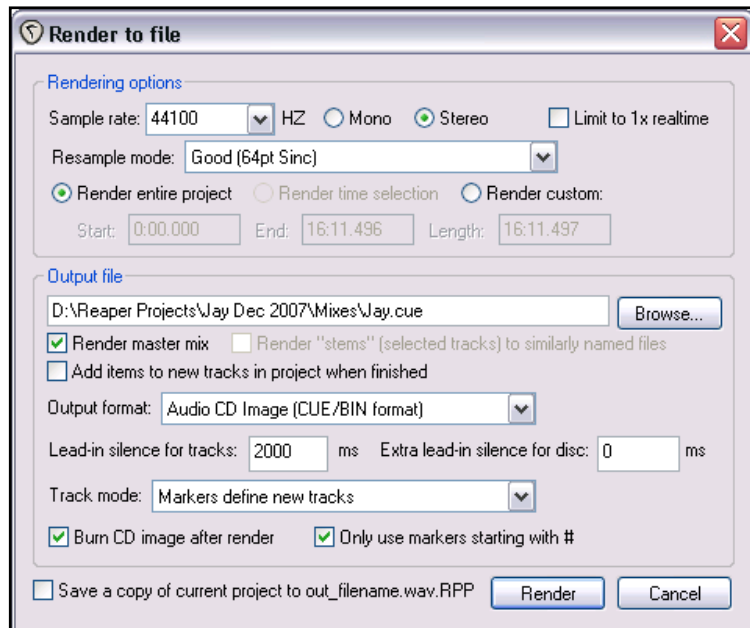
6. Save the Project File.
7. Now follow the instructions below for **Burning the CD**.

Burning the CD

1. Choose the **File, Render** command. You should now select the necessary options and settings for burning your CD:

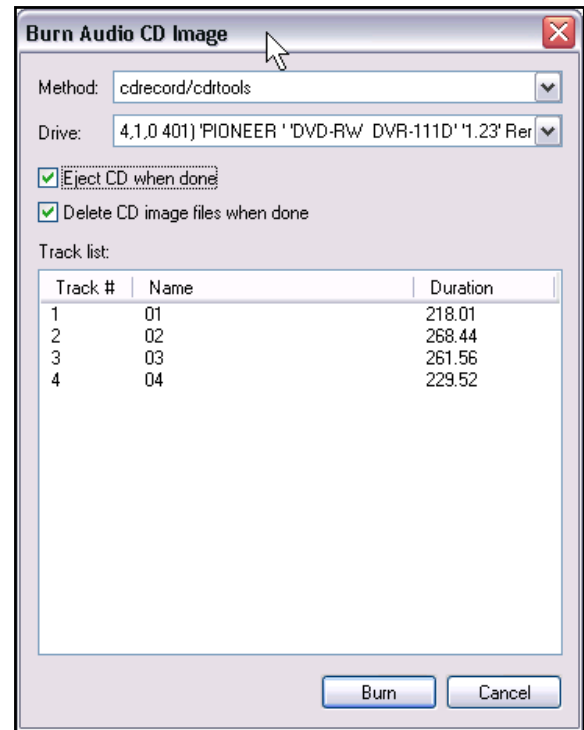
Sample rate: 44100
Stereo
Render entire project
Render Master Mix
Output format: Audio CD Image (CUE/BIN Format)
Markers define new tracks
Burn CD Image after render
Use only markers starting with #.

2. In the case of the first of our two examples (separate media items) you will probably also want to specify a **Lead in silence for tracks** of 2000 ms.



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3. In the case of our second example (continuous live performance, you will probably wish to leave this setting at 0.
4. Click the **Render** button and wait for the output file to be rendered. This might take a few minutes.
5. When rendering has been completed, the **Burn Audio CD Image** settings screen will be displayed.
6. Select your preferred method. This will depend on factors such as your PC set up and operating system. If in doubt, choose **cdrecord/cdtools** as shown.
7. Select **Eject CD when done**. Decide also whether or not you wish to keep or delete the CD image files when done.
8. Insert a blank CD into your CD drive and wait for it to load.
9. Click **Burn**.
10. Wait while the **Burning in progress** message is displayed.
11. When finished, the CD will be ejected. Click on **Close** to close any messages still displayed on the screen.



14.5 Saving Live Output to Disk

Finally (for this section), you have the option to export your live output to disk, using the **File, Export Live Output to Disk** command. This is similar to **File, Render**, except that whereas the Render command works off line, Export Live to Disk works in real time. This means, for example, that you can actually make adjustments on the fly to your settings while your project is being mixed down.

This has other uses too, such as recording continuously a log of the sessions to a compact file format such as MP3, so that later you can hear everything that was said about each take even though the transport was stopped and nothing was being recorded on the tracks. However, if you do set it to run non-stop, remember to stop the recording when you no longer need it, to avoid creating an unnecessarily large file.

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Notes

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15 Further Customising REAPER

In this section, you will learn other ways in which you can specify REAPER's appearance and behaviour, to tailor the program more closely to your particular requirements. In many cases, you'll probably be perfectly happy to leave the program settings as they are and just let it run. That's fine too.

15.1 Audio Configuration

We've already mentioned the **Audio Device** screen (in the **Preferences** window), but it's worth having another look at this topic.

Two important issues in the digital audio world concern **buffers** and **latency**. Understanding what these terms mean will help you in obtaining the optimum settings for your system.

Getting buffer size right is essential if you are to get the best performance from your audio interface. Make them too small and you'll get audio clicks and pops; make them too large you'll notice delays in your headphones when you're input monitoring, especially with software synthesizers.

The goal is to achieve the lowest possible latency without experiencing dropouts. The optimum setting depends on a number of things, not least of which are the audio interface (PCI sound card, firewire or USB device) that you are using, your PC's characteristics, as well as which software you're running. The use of plug-ins can also increase latency, some more than others.

Consider what happens when you are working at your DAW. As you play back your tracks, a constant stream of data passes from your hard disk and/or RAM to your sound card. Amongst other things, this converts the digital data to an analog form, so that it can be sent to, and heard through, your speakers or headphones. When you record the reverse happens – the incoming analog audio stream has to be converted to a digital format so that it can be stored on your hard disk.

When you are overdubbing, both of these activities are going on at the same time. Indeed, with input monitoring, the track or tracks being recorded are actually being fed into the computer in analog form, converted to digital, processed, then converted back to analog again as they are fed back to your headphones. Latency is a measure of this delay.

(Incidentally, you can make this activity easier if your audio device itself supports input monitoring. In this case, the incoming audio stream that is being recorded is fed straight back into your headphones before it even gets into the computer.)

As if this wasn't complicated enough, remember that Windows is performing all sorts of other tasks at the same time as you are recording. If you don't believe this, just bring up Task Manager some time, check the **Processes** page and have a look. That's what we mean by **multitasking**.

So how is Windows able to keep up with its other 99 or so tasks at the same time as handling your recording? It does so by dividing its resources between all the tasks at hand. In order to maintain a constant audio stream, small amounts of memory are allocated to storing this audio stream. These areas are called buffers.

Thus, as you play back your audio, Windows hands over to your sound card a block of audio that the sound card releases at a steady rate to your external amplifier. If it empties these buffers before Windows gets round to handing it some more, then you've got a problem. The same principle applies, but in the reverse direction, when you're recording. And again, when you're layering or overdubbing, or using REAPER's input monitoring, both activities are going on at the same time.

If the buffers are too small, you'll get gaps in the audio stream. These can lead to pops, crackles and in some cases even dropouts (that's when playback and/or recording just stops suddenly and unexpectedly). Making buffers larger is usually enough to fix this problem, but it brings with it another. Make them too large, and the data at the end of the buffer has a long wait before it is processed. That's when you experience unacceptably large latency, such as the delay between pressing a keyboard and hearing the note in your headphones.

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ASIO drivers generally offer better latency than do others. As a rule, the preferred order is ASIO, WDM, DirectX and MME, in that order. This is where the **ASIO Configuration** button on the **Audio Device** screen is so important (assuming, of course that you are using ASIO drivers).

This button gives you access to the software that controls your sound card's settings and behaviour. The illustration below is an example of this, using M-Audio's Delta 1010 as an example. In that example, clicking on the

ASIO Configuration button on the first screen has caused the second screen to be displayed. You should consult the documentation supplied with your sound card for further information and instructions.

There's one more issue here that requires explanation, and it's an important one.

The smaller the buffer size, the greater the load on your computer's CPU.

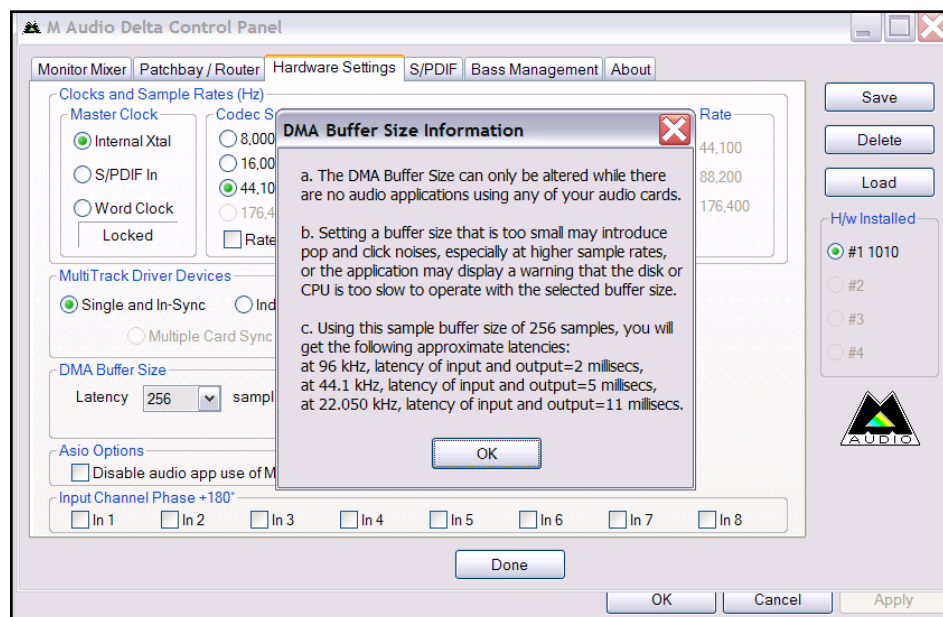
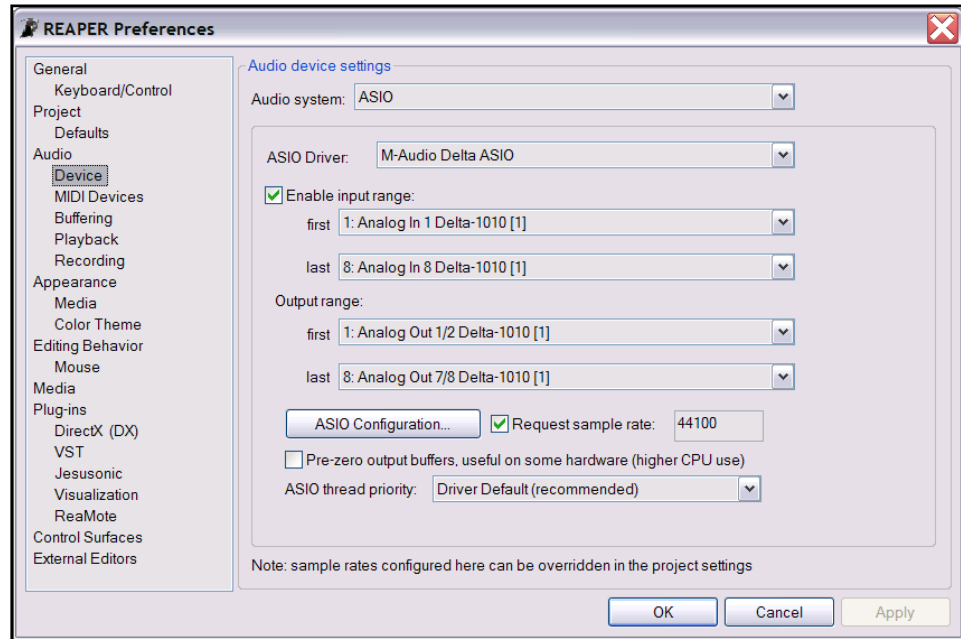
So after making changes to your buffer size, check the CPU usage on REAPER's Performance Meter.

You can use this fact to your advantage when mixing.

As a rule, low levels of latency are only really needed for recording, not when you are only playing audio back. Therefore, if you find that you are pushing your CPU close to its limits, you will often be able to fix this by accessing your audio card's control software and increasing the buffer size.

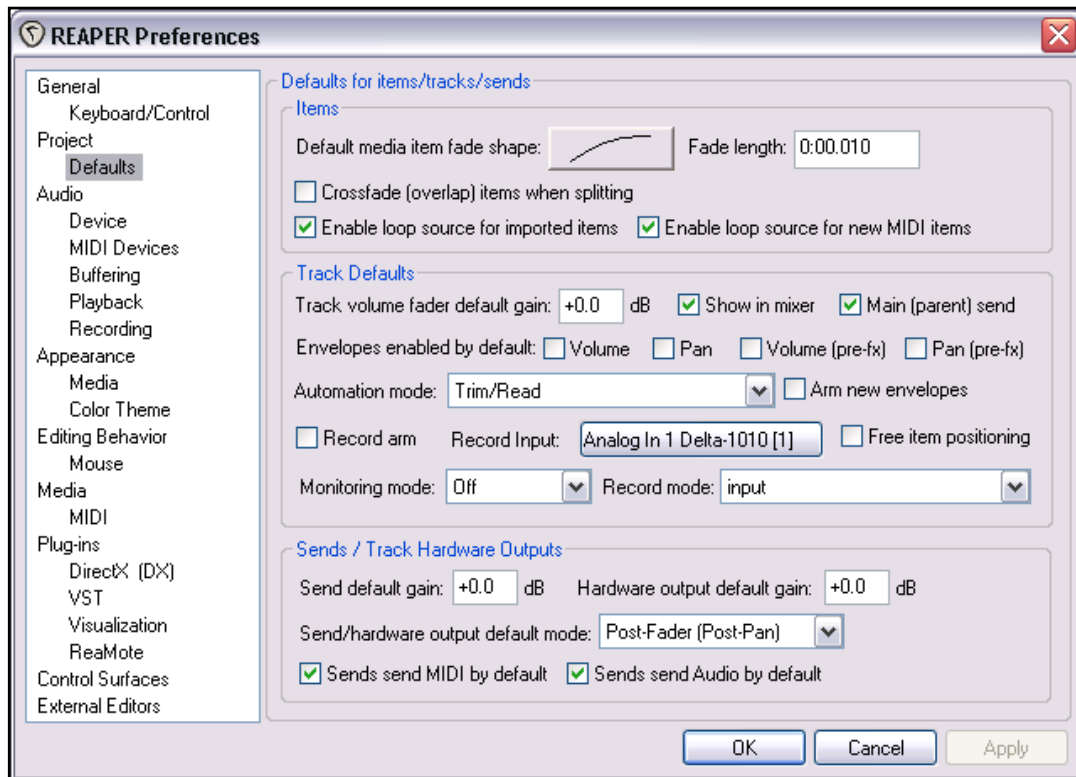
Finally. Just a word about **Sample Rate**. This also affects CPU usage. Going from 441000 to 88200 doubles CPU usage.

This is an area about which there is much debate, but in reality few of us have ears that can really detect whether a track has been recorded at 44100 or at 88200. Test this out for yourself and see what you think.



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15.2 Customising Project Defaults

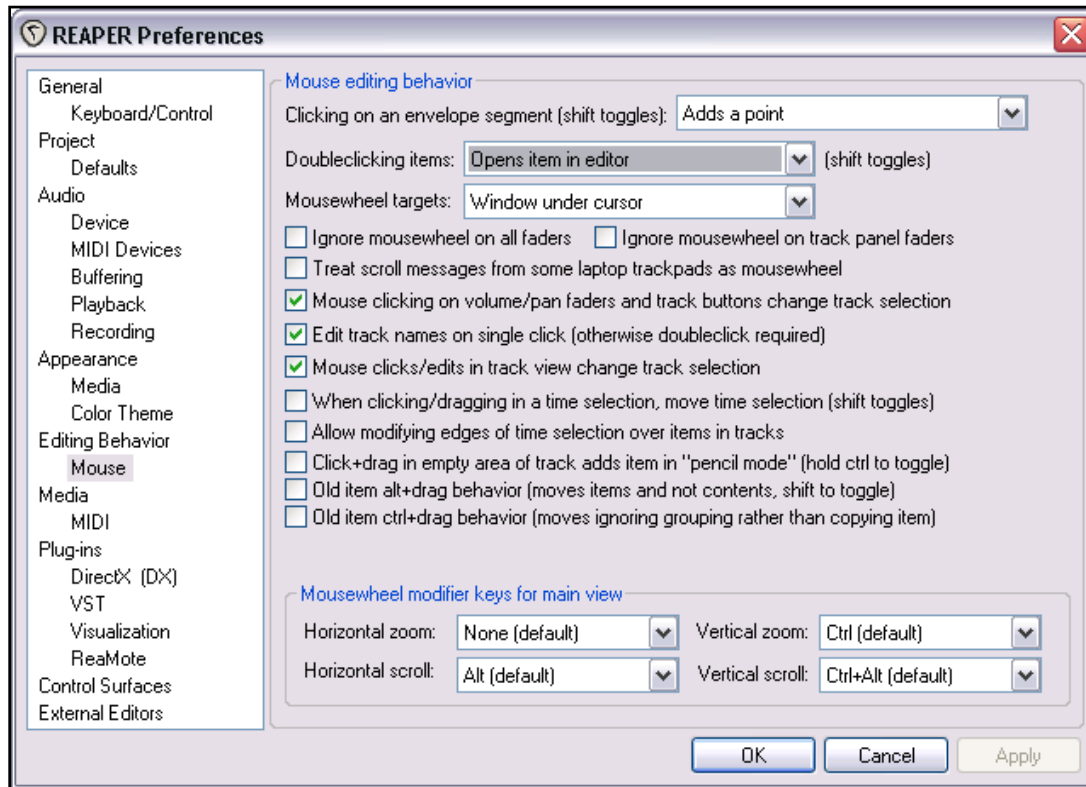


The **Project Defaults** page of the **Options, Preferences** window (shown above) includes a number of areas in which you can specify default settings for your REAPER projects. Here is a summary of some of the most useful options:

- You can select your preferred default item fade shape and length.
- Specify whether or not you wish to automatically create cross fades for overlapping media items in the same track.
- Determine whether imported media items should be automatically regarded as loop sources
- Specify a default gain value for track volume faders.
- Determine whether or not to have track Volume and/or Pan envelopes automatically enabled.
- Select a default hardware input for recording.
- Determine whether or not Monitoring is by default turned on when recording.
- Select a default recording mode.
- Specify your preferred default Automation Mode.
- Specify whether or not you would like free item positioning enabled for tracks by default.
- Select your preferred default output mode for track sends and receives.

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15.3 Customising Mouse Behaviour



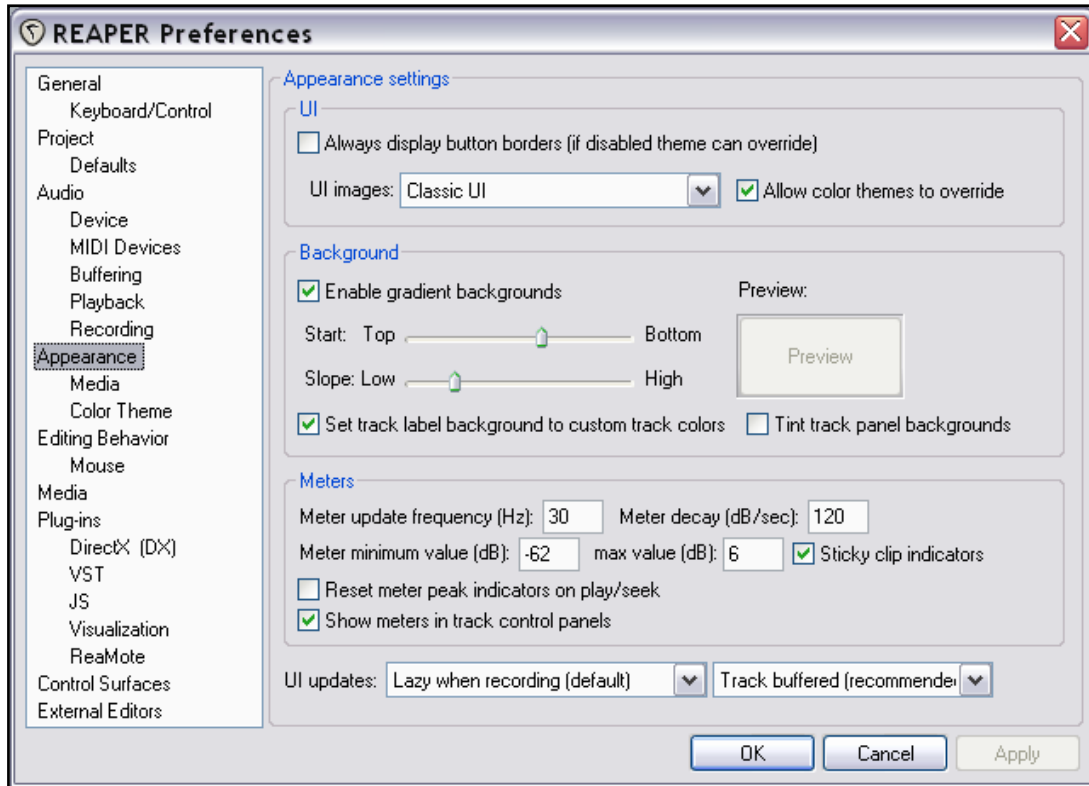
The **Mouse** page of the **Options, Preferences** window (shown above) includes a number of ways in which you can specify how you would like your mouse to behave in REAPER. Here is a summary of some of the most useful options:

- Whether clicking on an envelope adds a new point or selects that segment for adjustment (shift click will be assigned to whichever of these is not selected).
- Whether double-clicking on an item causes the item to be set as the current time selection, or loop selection, or whether it opens your selected wave editor to edit that item.
- Whether your mousewheel acts on the window currently underneath the mouse or on the last window to have focus.
- Whether to use or ignore the mousewheel on all faders.
- Whether to use or ignore the mousewheel specifically on track panel faders.
- Whether to treat a laptop trackpad as a mousewheel.
- Whether clicking on track fader or button causes that track to become the currently selected track.
- Whether to require a single click or a double click when editing track names.
- Whether selecting an item to edit in track view also causes that track to be selected in the track control, pane.
- Default behaviour with loop selection on timeline: the default is click and drag to select, shift click and drag to move the current loop selection.

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15.4 Customising Appearance

The **Appearance** settings screens within the **Preferences** window aren't as essential as the Audio Device settings, but they're more fun to play with. Your choices here control the way the REAPER screen appears.

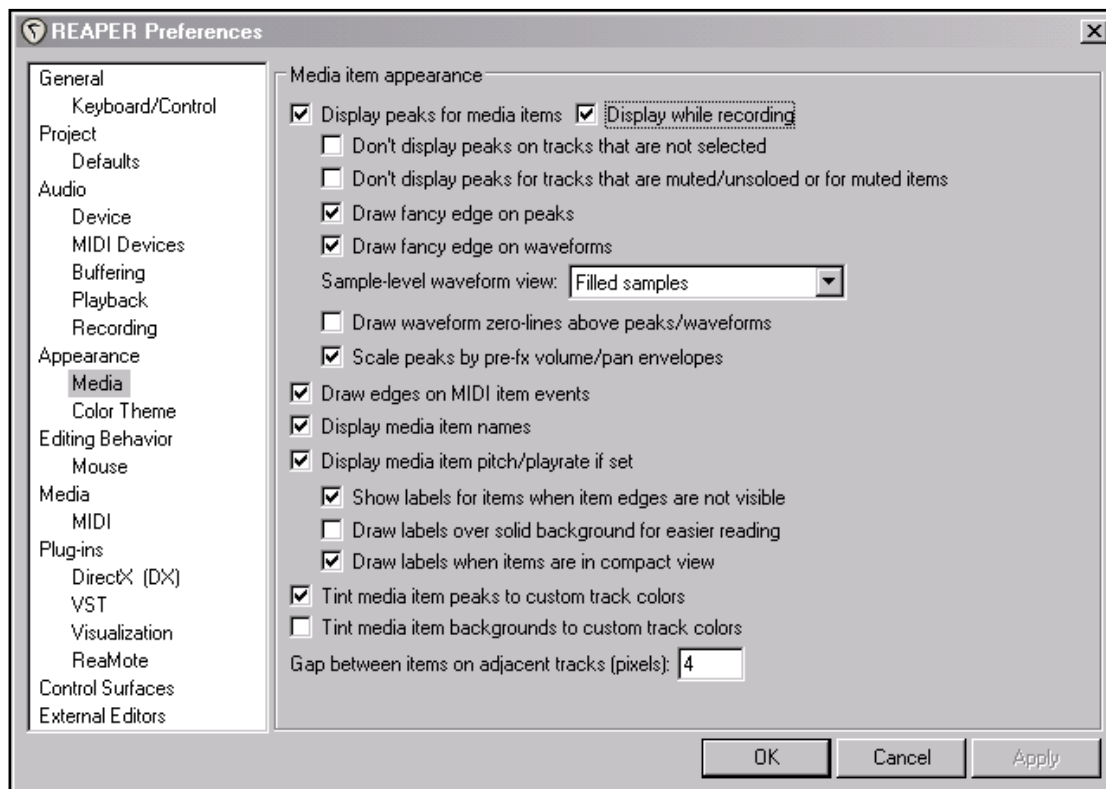


The **Appearance** screen itself lets you specify various parameters that help determine the appearance of your REAPER interface, especially the Track Control Panel and Mixer. Here is a summary of some of the options:

Item (s)	Comment
UI Options	This allows you to choose a preferred default icon set. You can choose whether or not you want the icon set supplied with your preferred colour theme (see later in this section) to override this.
Background Options	You can specify whether or not to apply a gradient background to your track control panels, and also set the parameters for that gradient. Note that this is over-ruled by some colour themes. You can also decide whether or not Track Label Backgrounds and/or Track Panel backgrounds should be tinted with custom track media item peak colours .
Meters Options	Your options for controlling your VU Meter display include: <ul style="list-style-type: none">• Meter update frequency and decay rate.• Minimum and maximum dB values for meter display.• Whether to display meters in the Track Control Panels.

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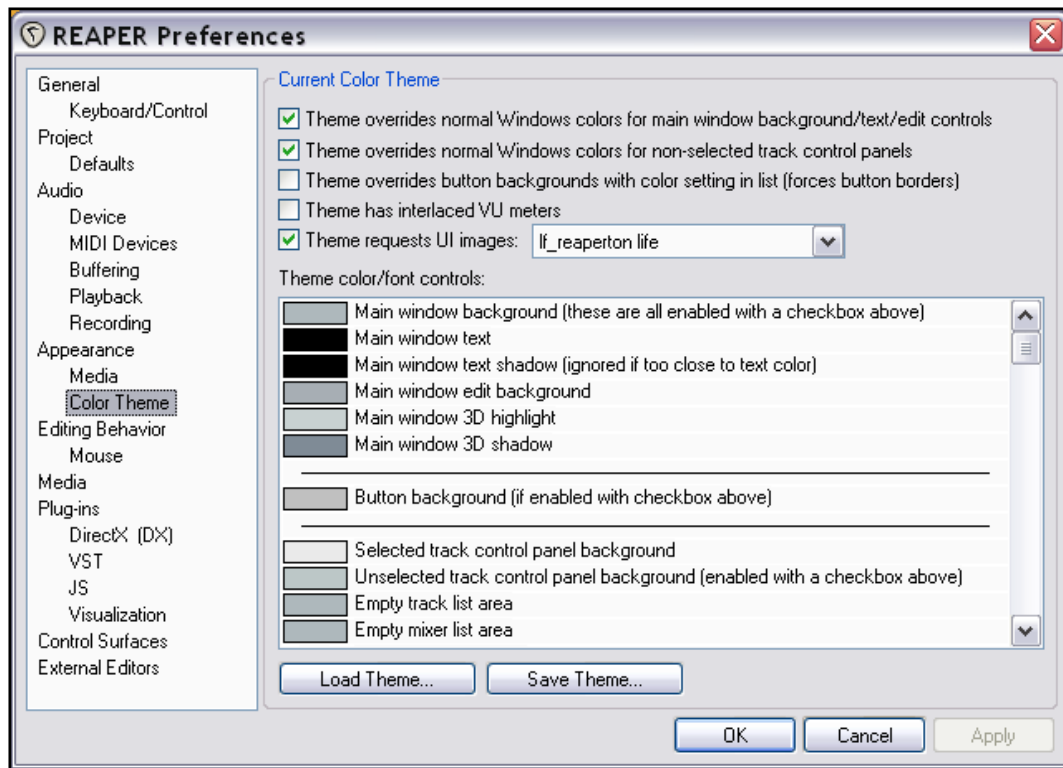
The **Appearance Media** Preferences window is used to determine how your Media Items will be displayed.



The table below summarises some of the main options:

Item	Comment
Display peaks for media items	Uncheck if you do not want media peaks displayed.
Display while recording	Uncheck this if you do not want peaks to be displayed on the fly while you are recording.
Don't display peaks on tracks that are not selected	Choose this option if you want media peaks to be displayed for any currently selected tracks / items only.
Don't display for tracks that are muted/unsoloed or for muted items	Choose this to ensure that peaks are not displayed for muted or unsoloed items and tracks.
Fill waveform , draw edge when zoomed in Show discrete samples when zoomed in Show samples as filled bars	These three options between them determine how the peaks are displayed when you zoom in very closely, as you might need to do for precise editing.
Sample level waveform view	Determines how waveforms are displayed when zoomed right in to display individual samples.
Display media item names Display item pitch/playrate if set	Determines whether or not names and/or pitch/playrate are displayed on your media items.
Tint ... to custom track colours	These two options determine whether custom track colours are applied to media item peaks/backgrounds.
Gap between items on adjacent tracks	Creates a vertical space between adjacent items.

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The **Color Themes** screen (above) has numerous options for controlling your screen's appearance. You can change the colours for any of the items listed under **Theme colour/font** controls, including:

Track Control Panes	Window Background	The Mixer	Markers and Regions
Track View Background	The Timeline	Faders	The Edit Cursor
Track Pane Backgrounds	Gridlines	VU Meters	The MIDI Editor
Media Items	Envelopes	The Docker	Screen Fonts

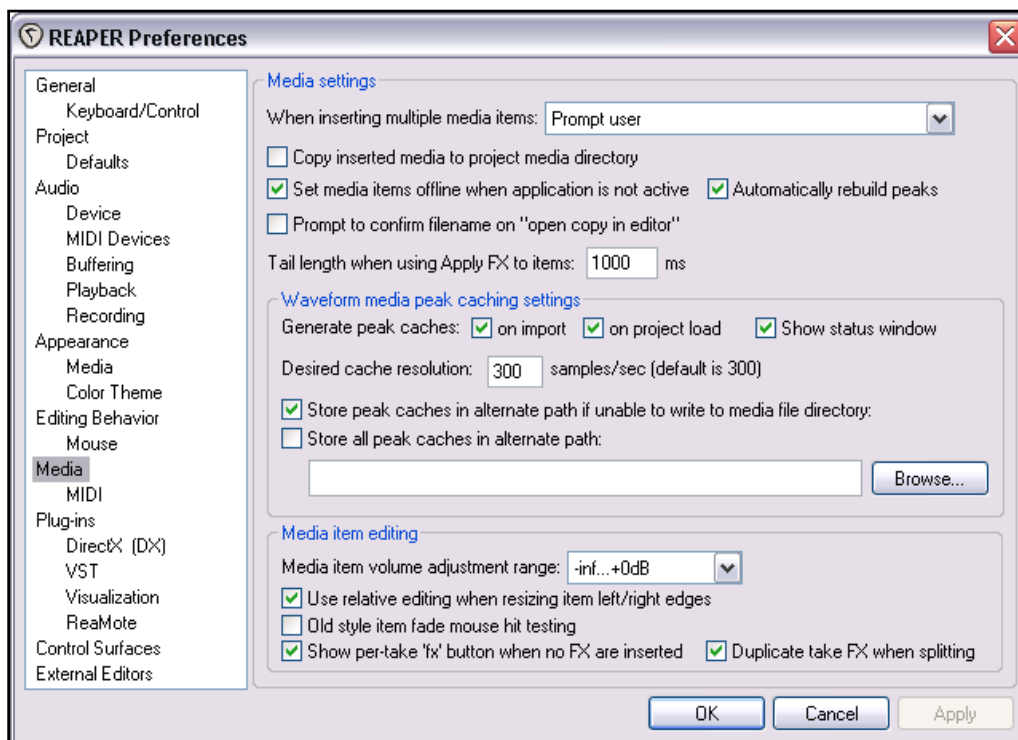
Here is a summary of some of the other options that you might find useful.

Item	Purpose
Theme has interlaced VU meters	Causes VU meters to be displayed as interlaced.
Theme requests UI images	Display the drop down list and choose from an assortment of icon sets for your various control buttons, on the Main Toolbar, the Track Control Buttons, and the Transport Bar.
Theme color/font controls	Click on the displayed font size or (more commonly) colour displayed for any item to specify any font or colour (as appropriate) of your choice.
Load Theme	Allows you to load any of a number of existing colour themes into REAPER.
Save Theme	After you have made any changes, you can save your screen colours to a new theme.
Load Defaults	Restores REAPER's default colour scheme.

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15.5 Customising Media Preferences

The **Media** page of the **Options, Preferences** window lets you customize your Media settings.



Here is a summary of some of the other options that you might find useful.

Item	Purpose
Media Settings	When inserting multiple media items: You can choose whether the default behaviour should be to insert as separate tracks, to insert sequentially in a single track, for REAPER to determine which appears the more appropriate, or whether you wish to be prompted each time. Copy inserted media items to project media directory: When enabled, this ensures that a copy of any media items inserted into a project will be made and stored in the project directory. This helps you to keep together all those files that belong together.
Waveform media peak cache settings	Generate peak caches: You can determine the circumstances in which you want peak caches to be generated. Desired cache resolution: Determines the degree of precision used for media peaks.
Media item settings	Use relative editing when resizing item left/right edges: Holding Ctrl and Alt when fade dragging will adjust fades according to your edge option setting.

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15.6 Custom UI Tweaks

The **General** page of the **Options, Preferences** window includes an **Advanced UI/System tweaks** button which enables you to further customise REAPER's on-screen appearance. Clicking on this button displays a number of options including:

Custom Splash Screen – impress your clients by having REAPER open automatically displaying your studio's logo! Must be a .BMP or .PNG file.

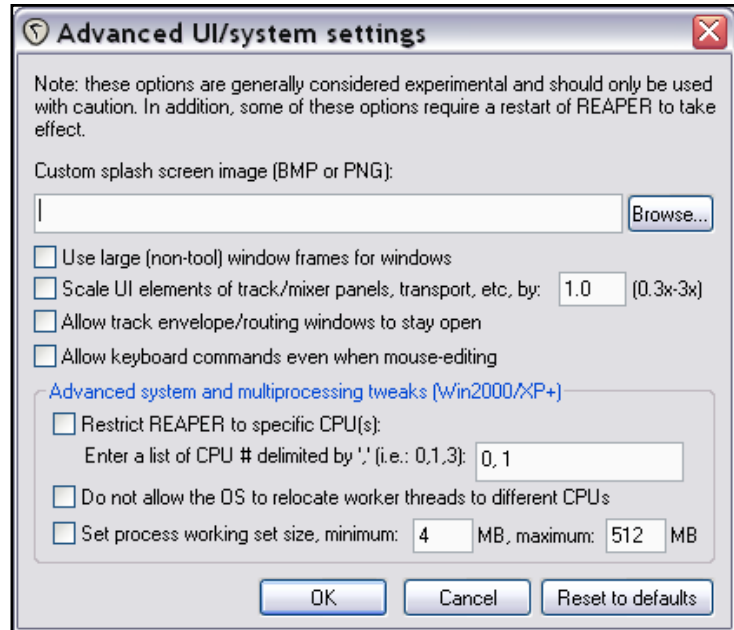
Use large window frames for windows.

Scale UI Elements (such as buttons on toolbars). This can be especially useful if you are working with a very high screen resolution.

Allow track envelope/routing windows to stay open. Select this option if you want track routing and envelope windows not to be closed automatically when they use focus.

Advanced multiprocessing tweaks.

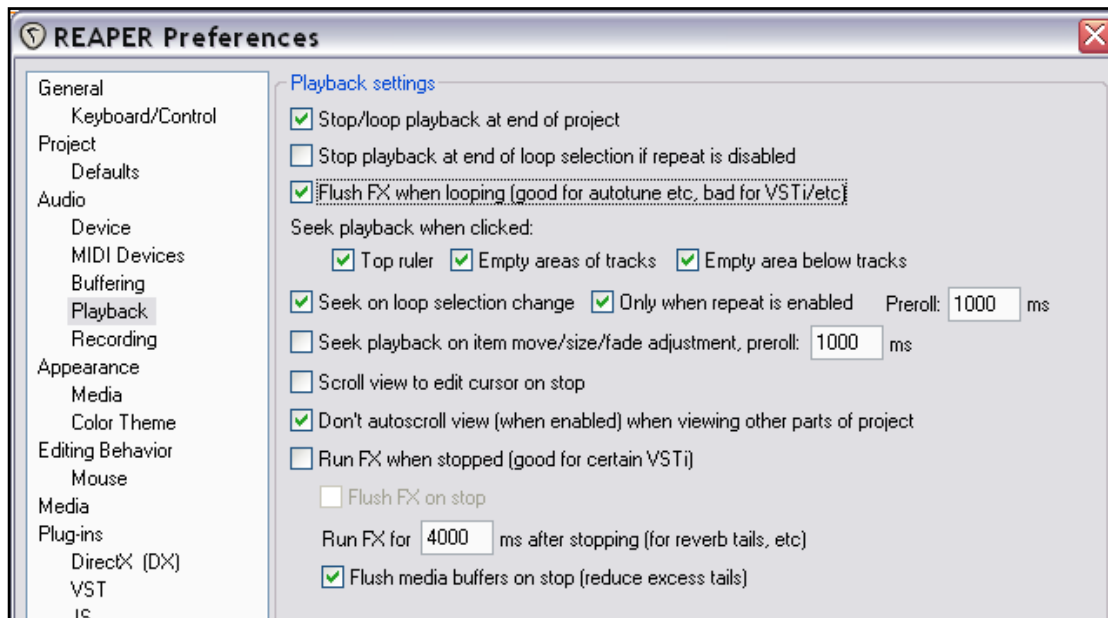
These options help determine the way REAPER behaves on a system with two or more processors.



15.7 Further Customising Playback Behaviour

Basic control of playback behaviour has already been covered earlier in this guide.

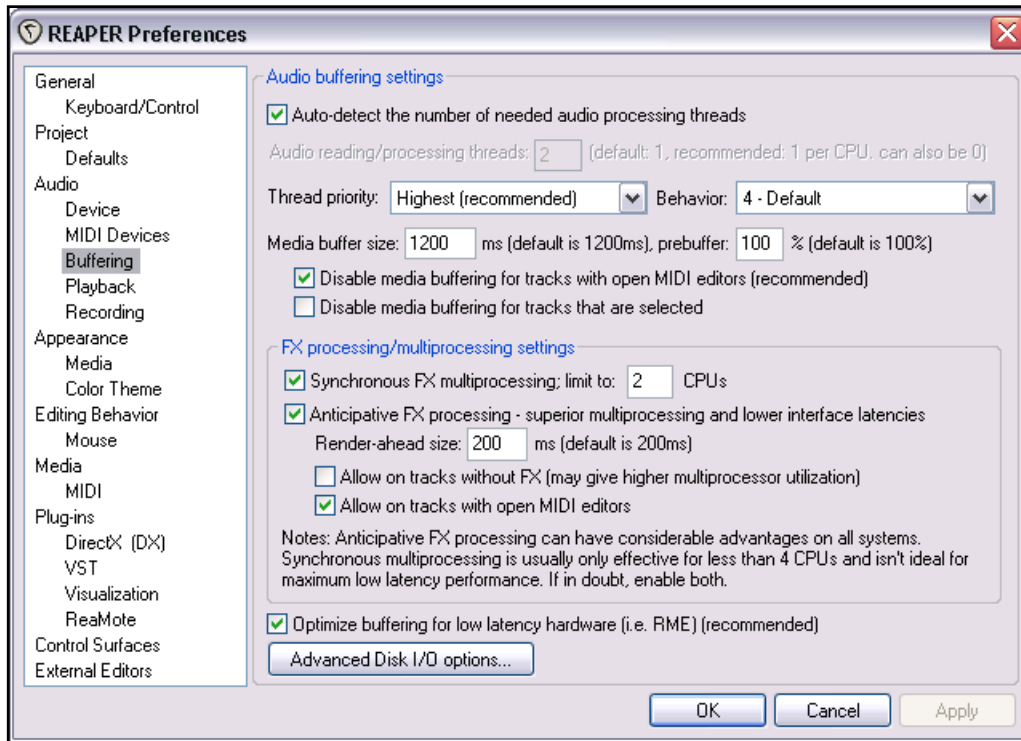
In addition, the **Playback** page of the **Options, Preferences** window lets you set a number of further options (see above) such as **Stop playback at end of project** and **Run FX when stopped** (to play reverb tails).



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15.8 Customising Audio Buffering Preferences

The **Audio Buffering** page of the **Preferences** window contain a number of customisation options.



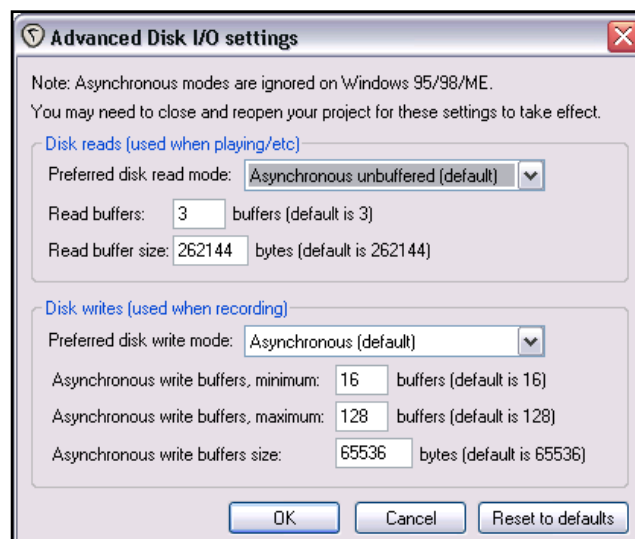
The option to **Disable media buffering for tracks that are selected** can be useful if you are using a third party plug-in that does not respond well to buffering. Otherwise, if you are not technically minded you would be best advised to leave most of these settings at their default values.

If your computer has two or more processors, you might find the following options useful.

Synchronous FX multiprocessing only matters on multiprocessor systems. If enabled, it allows all tracks (record armed or not) to have FX processed by multiple CPUs. Note that although a useful option it will not produce miracles for you. This is in part because synchronizing multiple CPUs in this way has its own overhead, and in part because it cannot do a perfect job of balancing the load. Also, it can have a slight negative effect at smallest audio latencies.

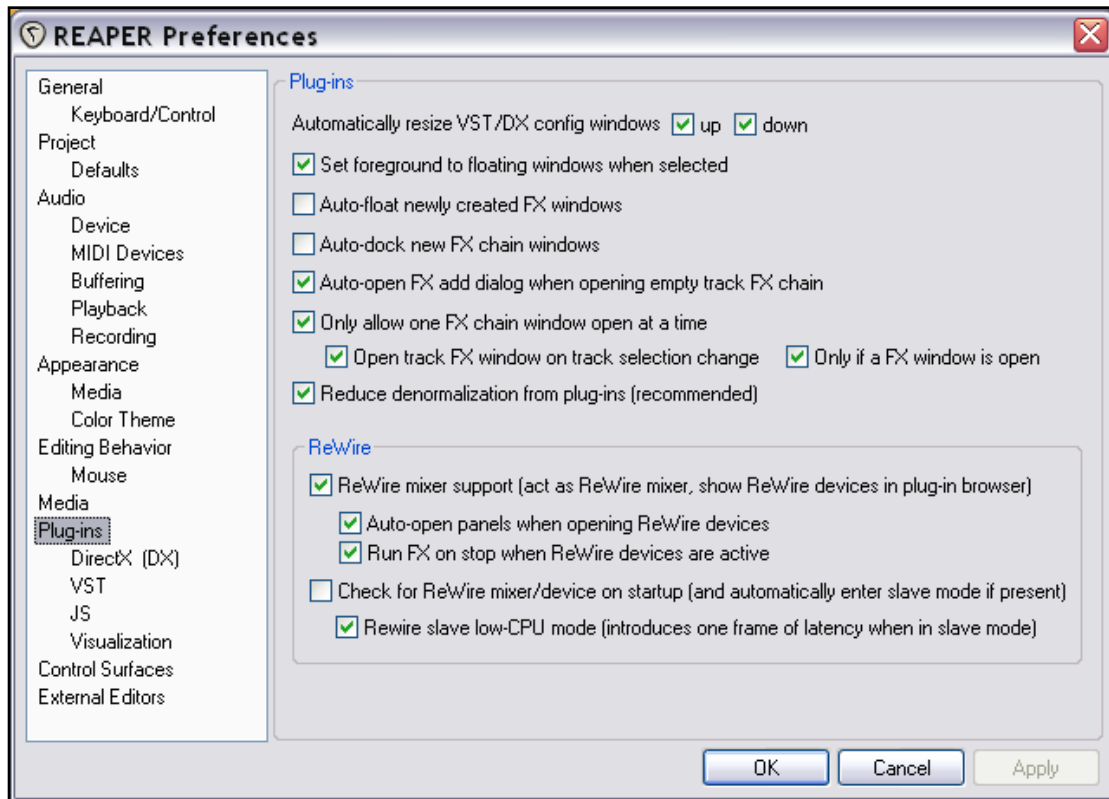
Anticipative FX processing has benefits for both multiprocessor and single processor systems. On single processors it makes REAPER more tolerant of lower interface latencies (and more resistant to plug-ins that do larger block-based processing, such as ReaVerb and ReaFir). On multiprocessor/multicore systems it also allows for very significant multiprocessor usage. Enabling this feature may allow improved latency.

Notice also that clicking on the **Advanced Disk I/O Options** button brings up the selection of options shown here.



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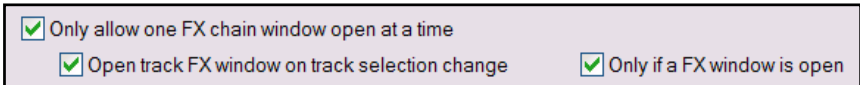
15.9 Customising Plug-Ins Interface and Behaviour



The **Plug-Ins** page of the **Options, Preferences** window gives you a number of really useful options to control the way your plug-ins interface and behave within REAPER.

Among your options are the following:

- To automatically resize the FX window to suit the currently selected plug-in in that window. This does not apply when the FX Window is docked.
- To ensure that any selected floating window is set in the foreground.
- To automatically float (or not) new FX Windows.
- To automatically dock new FX chain windows.
- To ensure that the Add FX Dialog Box is automatically opened when you open an FX Window that has not yet had any plug-ins added into it.
- To only allow one FX Window open at a time.
- By selecting all three options shown (right) you can ensure that one FX window is kept open (docked or otherwise), and that that window will always show the FX Window for whatever track is currently selected in the Track Control Panel.

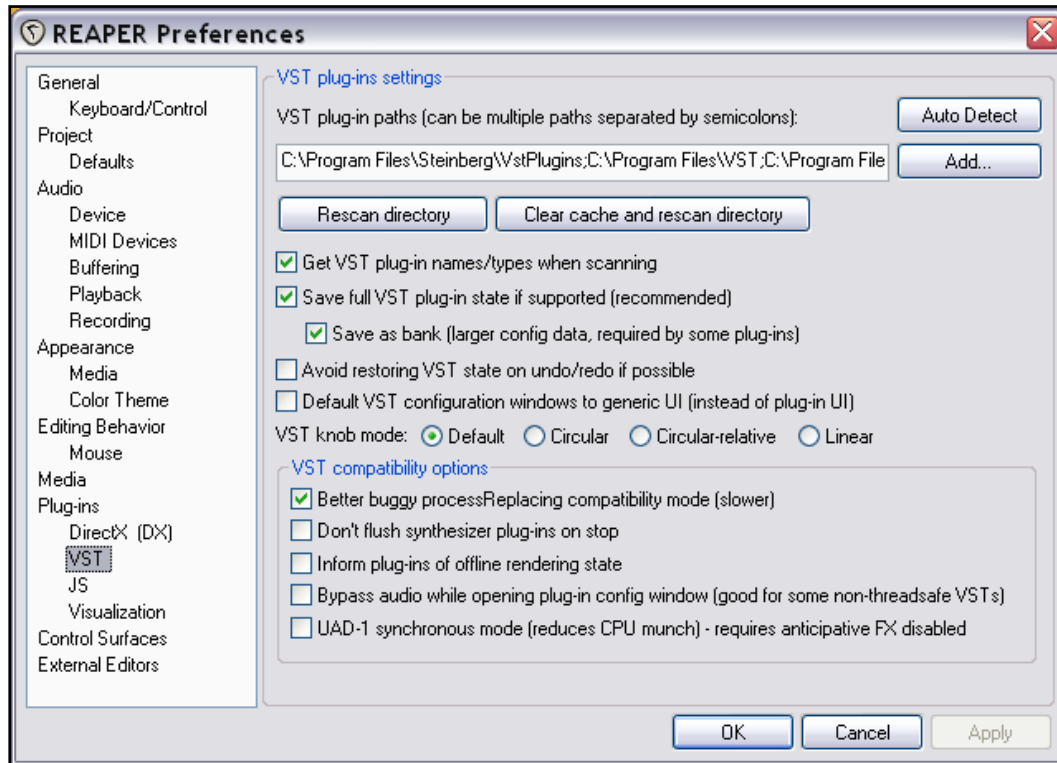


Tip: This can be especially useful when you have the same FX (e.g. EQ) inserted in several tracks, and you want to make sure that the EQ you are tweaking really is the EQ for the currently selected track.

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15.10 Customising VST Plug-In Behaviour

The **VST** screen (under **Plug-ins** within the **Preferences** window) offers a number of options for controlling the behaviour of your VST plug-ins in particular:



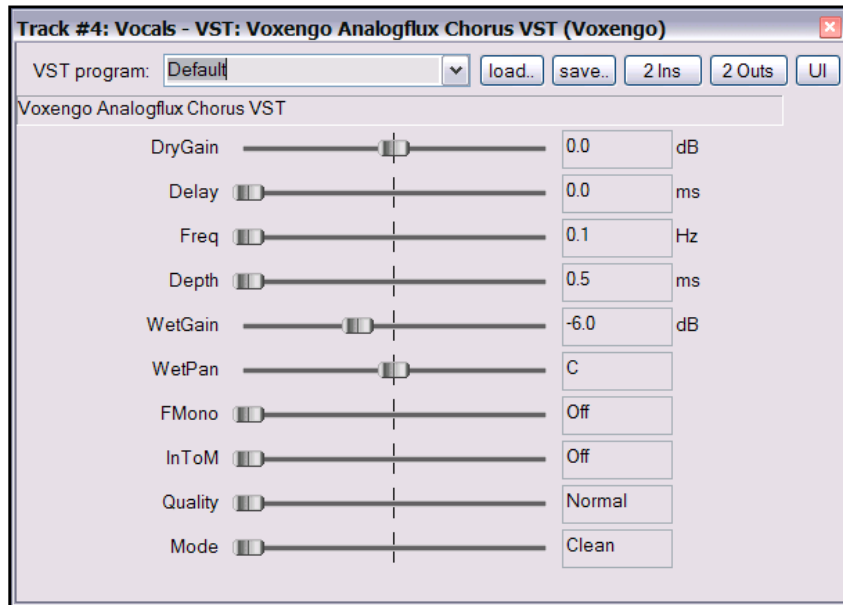
Your preferences, especially in the category **VST compatibility options** are likely to depend on which plug-ins you are using. You may need to experiment to get the best results.

One useful option worth mentioning is **Default VST configuration windows to generic UI**. This can be used to ensure a consistency of interface for all VST plug-ins which may not look as superficially attractive but may be easier to read and use. Here's a comparison between the two interfaces for one plug-in:

Voxengo Analogflux Chorus VST, displayed using its native user interface.



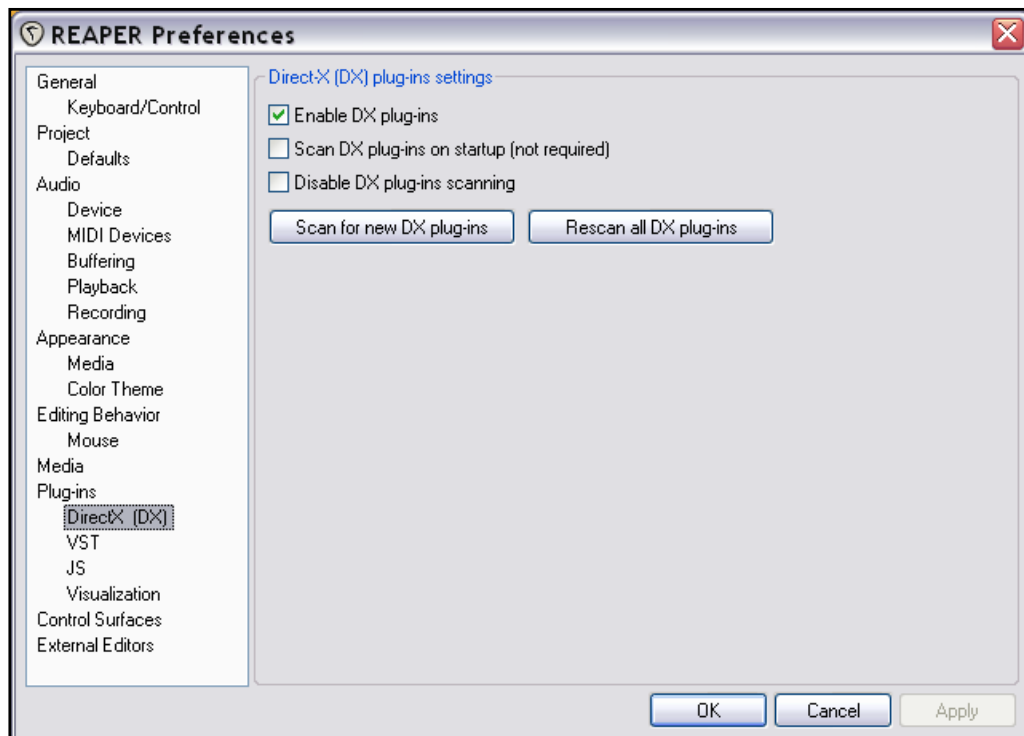
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The same plug-in displayed using REAPER's generic user interface.

The **UI** button can be used to switch between the two interfaces.

15.11 Direct X Plug-in Preferences



Use this page to globally enable or disable Direct X plug-ins (by default they are enabled), to force a scan for new Direct X plug-ins, or a rescan of existing ones.

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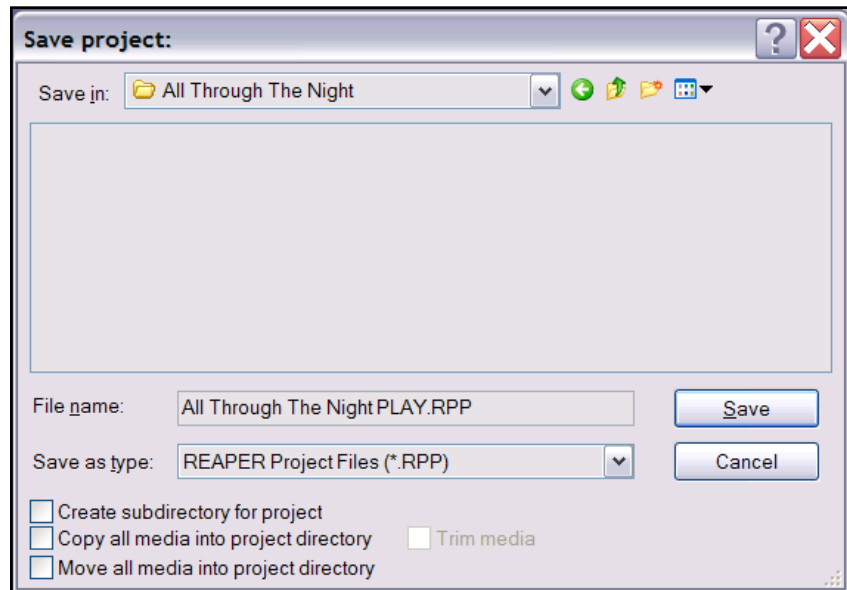
15.12 Project and File Management

You have already seen that when you save a REAPER project file you have the option to create a subdirectory for that project, and to copy, move and store all of the project's media files into that directory.

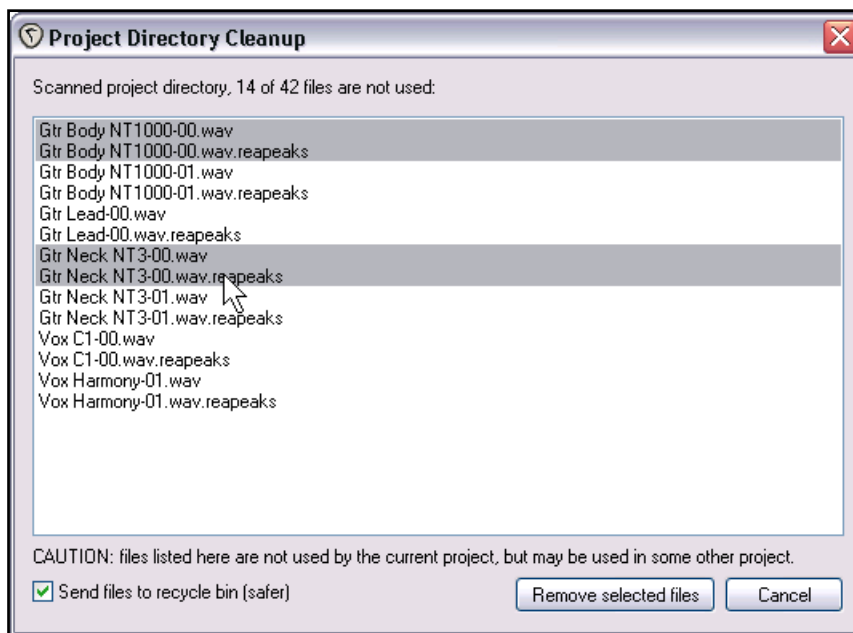
Making use of this option will make it easier for you to keep track of your work.

However, you will most likely find that as a project evolves, it will accumulate any number of media items, such as rejected tracks and overdubs, or deleted items that are no longer required.

You can easily remove these unwanted items, using the command **File, Clean Current Project Directory**.



Notice that all files present in the project directory but not belonging to the current project will be listed.



To select any one file, just click on its file name.

To build up a selection, hold the **Ctrl** key while you click on each required file name.

To select all files in the list displayed, click first on the first file name then, holding the **Shift** key, click on the last file name in the list.

You then have the option to either delete these files permanently from your hard drive, or to send them to the Windows Recycle Bin (as selected here).

After making your selection, click on the **Remove Selected Files** button to remove them.

Don't forget also to **backup** your

work regularly, to a flash drive, external hard disk, CD or DVD, or better still, more than one of these.

The easiest way to back projects up is to simply use the Windows file management system.

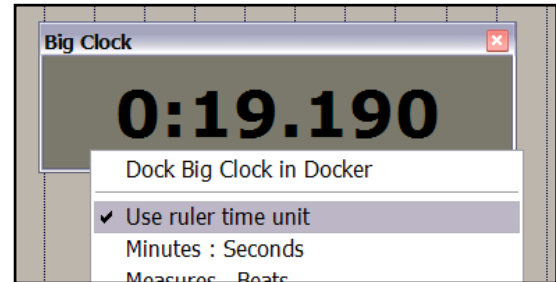
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15.13 Customising the Time Display

To select your preferred units for display on the ruler, right click over the ruler and choose any of the available options from the context menu – for example Minutes:Seconds, Measures:Beats, Samples, etc..

Note that your ruler display settings are applied on a per project basis, whereas by default the Big Clock setting is global.

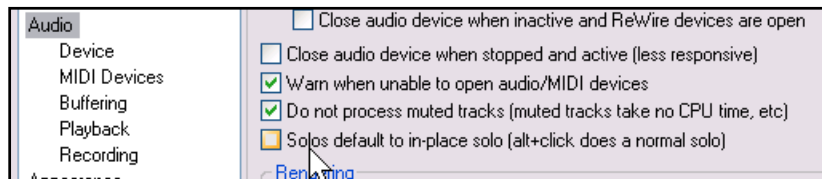
However, by selecting for the Big Clock the option to **Use ruler time unit** you can effectively ensure that the Big Clock time display is also determined on a per project basis.



15.14 Customising Track Solo Behaviour

If you are taking anything like full advantage of REAPER's routing capabilities, you can run into difficulties with track soloing. By default, when you solo a track that is routed to perhaps several other tracks (directly and indirectly), you will hear the output of these sends as well as the original track by itself. This is called *in place* solo. It might not always be what you want.

Under **Options, Preferences, Audio** you can deselect the option **Solos default to in-place solo**. This means that when you solo a track, you will hear just that track by itself, without its entire routing.



If you change this default, at any time and for any track you can temporarily over-write this. To solo any track in-place, hold the **Alt** key as you click the track's Solo button.

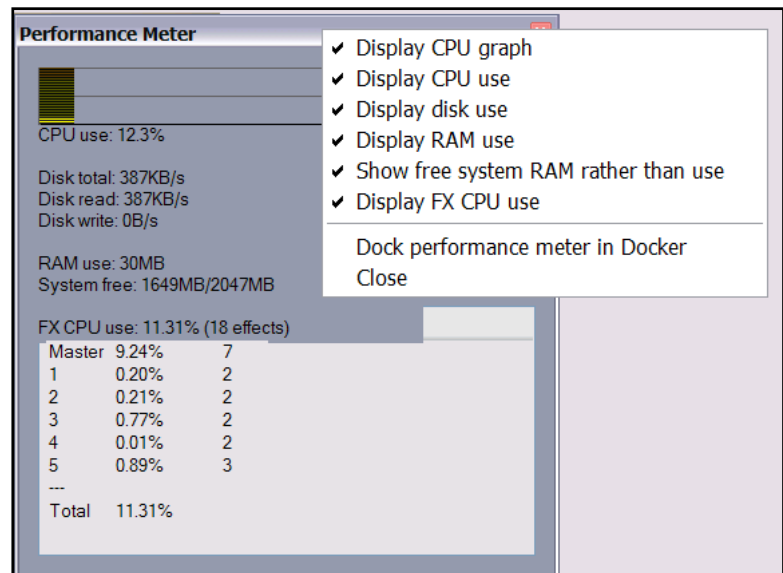
15.15 Customising the Performance Meter

You can customise the performance meter, making your selections from its context menu (see right).

Optionally, the following can be displayed or omitted:

- CPU Graph
- CPU Use
- Disk Use
- RAM Use
- Free System RAM
- FX CPU use and number

The Performance Meter window can also be docked or undocked.



15.16 Customising the Transport Bar

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Right-clicking over the **Transport Bar** produces the menu shown right, which includes a number of customisation options.

Time Unit: This can be set to be automatically the same as that used for the ruler, or you can select one of the other available formats.

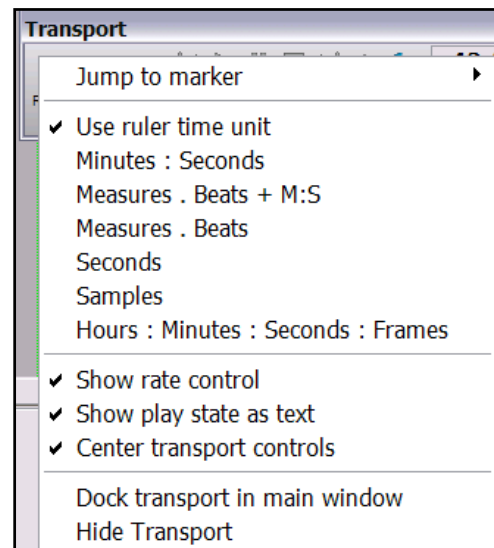
Rate Control Fader: This can be displayed or hidden.

Play State as Text: This can be shown or not shown, as you choose.

Centre Transport Controls: This can be on or off. If off, controls will be aligned to the left.

Dock Transport in Main Window: Use this setting to determine whether you want the Transport Bar docked or floating.

Hide Transport: This hides the Transport Bar from view. To restore a hidden transport bar, press **Ctrl Alt T**.

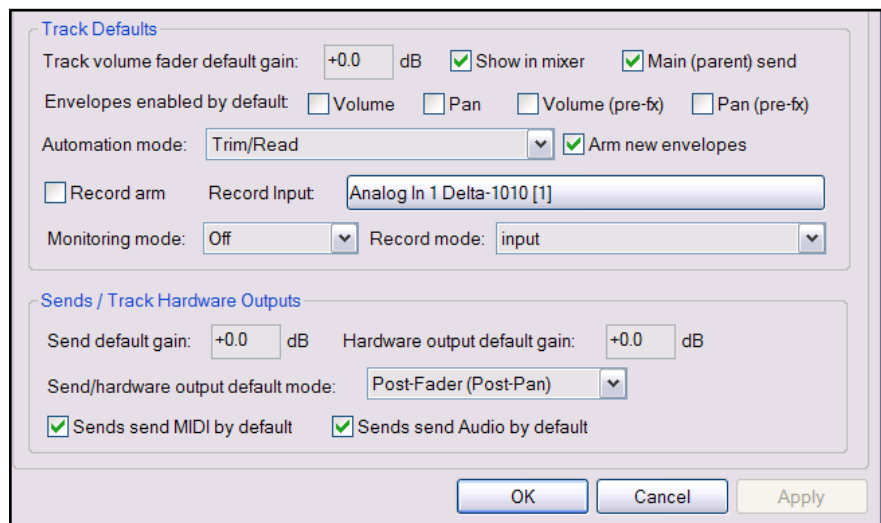


15.17 Customising Track Default Settings

Track default settings can be customised on the **Project Defaults** page of the **Options, Preferences** window.

Notice that, amongst other things, here you can specify:

- Whether new tracks are automatically shown in the mixer.
- Default automation mode and whether envelopes are armed by default.
- Whether new tracks are automatically armed for recording, with or without input monitoring.
- Default Record mode.
- Default track send behaviour.

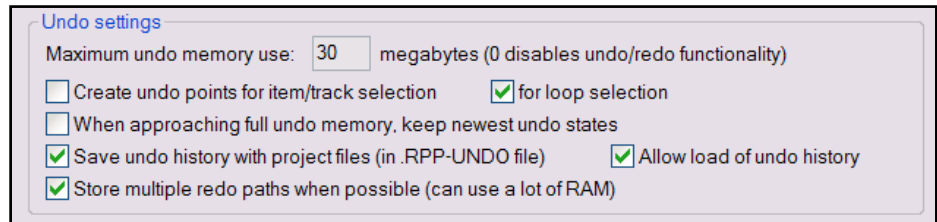


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15.18 Customising Undo History Behaviour

Three important features of REAPER that enable you to customise your Undo History behaviour are:

- Save Undo History with project files,
- Allow load of Undo History, and
- Store multiple redo paths where possible.

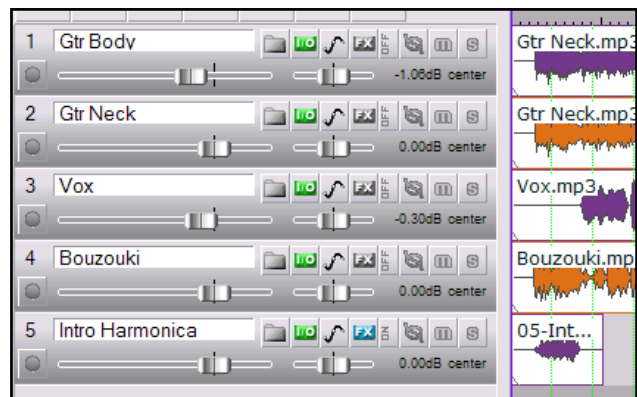
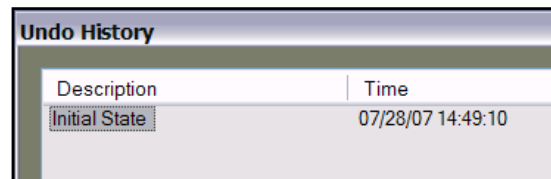


All of these features can be selected from the **Undo Settings** section of the **Options, Preferences, General** screen (shown above).

Example

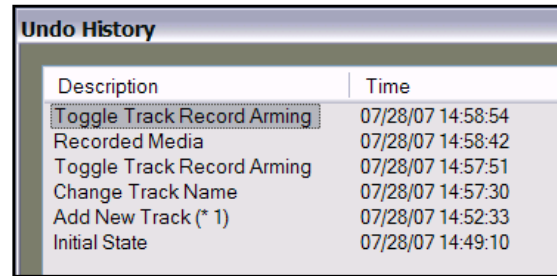
Let's consider our **All Through The Night** project file. Suppose we wish to lay down an extra instrument to play over the intro to this song, but perhaps we're not sure whether we prefer to use (say) a harmonica or a flute. One solution would be to record both scenarios, with our undo features enabled. This will allow us to then switch easily between the two scenarios.

1. Open the file **All Through the Night.RPP** and save it as **All Through the Night UNDO.RPP**
2. Press **Ctrl P** to open your Preferences window, select **General** and specify your **Undo settings** as shown above.
3. Press **Ctrl Alt Z** to display the Undo History Window. This should be similar to that shown on the right.
4. Select the last track. Press **Ctrl T** to insert a new track. Name this track **Intro Harmonica**. Arm it for recording, then record a harmonica to accompany the guitars during the introduction to this song. If you don't have a harmonica, just hum instead! After recording, unarm the track.
5. Your project will now resemble this (right), and your Undo History will be similar to that shown below.



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6. Now in the Undo History Window, double click on **Add New Track**, as shown on the right. Notice that the track you added earlier is now unnamed and contains no media items.
7. Label the empty track **Intro Flute**, arm the track and record a flute to accompany the guitars during the introduction to this song. If you don't have a flute, whistle!
8. After recording, unarm the track that you have just recorded.
9. Notice that your Undo History displays a **(*1)** against **Add New Track**. This is because this is the first point in this project where you have embarked on alternative paths.
10. Notice also that Track 5 is now labelled **Intro Flute** and contains a brief recording of you playing the flute (or whistling),
11. Now right-click the mouse over the text **Add New Track** to display a context menu.

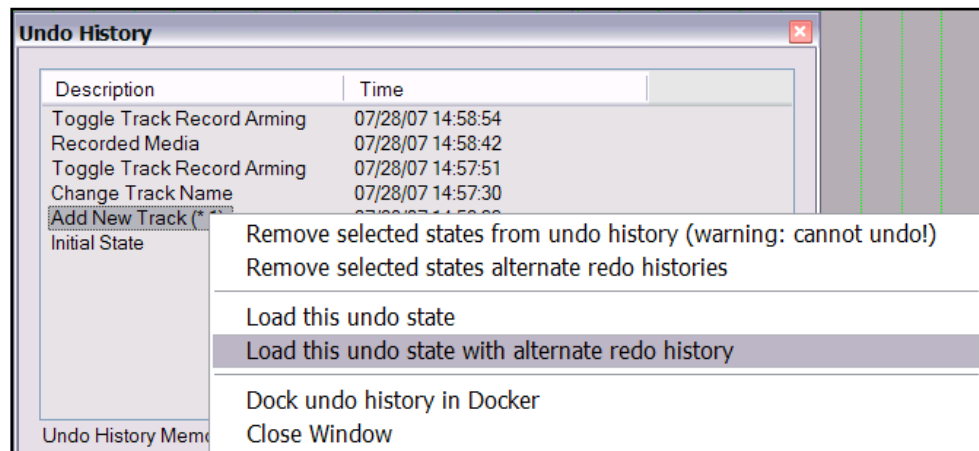


Description	Time
Toggle Track Record Arming	07/28/07 14:58:54
Recorded Media	07/28/07 14:58:42
Toggle Track Record Arming	07/28/07 14:57:51
Change Track Name	07/28/07 14:57:30
Add New Track (* 1)	07/28/07 14:52:33
Initial State	07/28/07 14:49:10



Description	Time
Toggle Track Record Arming	07/28/07 14:55:37
Recorded Media	07/28/07 14:55:08
Adjust Master Volume	07/28/07 14:54:21
Toggle Track Record Arming	07/28/07 14:52:51
Change Track Name	07/28/07 14:52:49
Add New Track	07/28/07 14:52:33
Initial State	07/28/07 14:49:10

12. From this menu, choose **Load this undo state with alternate redo history**.
13. Now double-click on the item **Toggle Track Record Arming** at the top of the Undo History window. The Flute track will be replaced by the harmonica track.
14. Repeat steps 11, 12 and 13. The harmonica track will now be replaced by the flute track!
15. Save this file.



Description	Time
Toggle Track Record Arming	07/28/07 14:58:54
Recorded Media	07/28/07 14:58:42
Toggle Track Record Arming	07/28/07 14:57:51
Change Track Name	07/28/07 14:57:30
Add New Track (* 1)	07/28/07 14:52:33
Initial State	07/28/07 14:49:10

Remove selected states from undo history (warning: cannot undo!)

Remove selected states alternate redo histories

Load this undo state

Load this undo state with alternate redo history

Dock undo history in Docker

Close Window

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15.19 Some Other REAPER Options

The following are items that appear on the REAPER **Options** menu that are not adequately covered elsewhere in this User Guide. In most cases, you can find out more by consulting REAPER's On-Line WIKI.

Enable snapping

This option will toggle snapping to the grid. Items will snap to the specified grid locations. That is to say that they will snap to the grid lines. The amount of 'snap' will depend on the resolution that you specify in the snap settings. If you turn this off, items will move free of the grid and will not snap to the lines.

Snapping behaviour is determined by the **Snap/Grid Settings** (see right). This includes the option to use **Smooth Seek**.

With this option enabled, seeking is totally changed, especially for projects aligned to the grid. If you want to jump from one part of the time line to another without playing in between those parts then enable this, and go to the measure you want to hear next. It won't move there right away, but after the measure you are on is over. Then it will smoothly go to the later part making a seamless transition. It will smoothly seek the next part, without pausing. This can be handy for trying different chorus or verse combinations etc.

This feature can also be enabled and disabled directly from the **Options** menu.

Show grid

This will show the lines of the grid in order to line items up with it. Grid characteristics are determined by your **Snap/Grid Settings**.

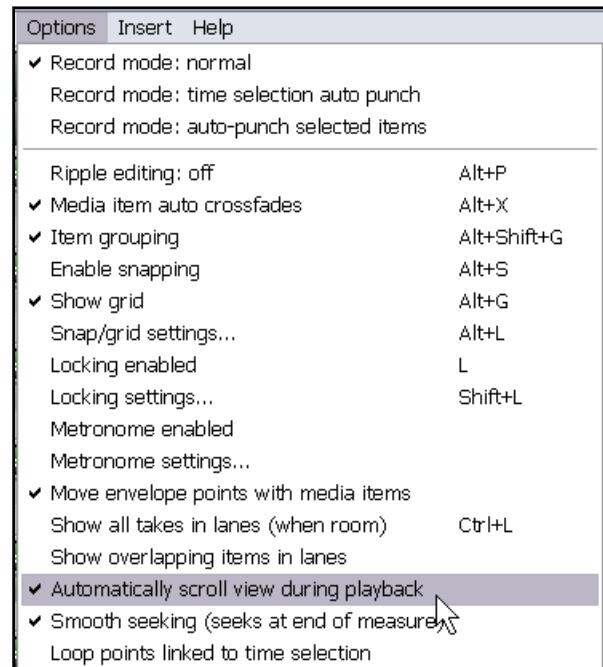
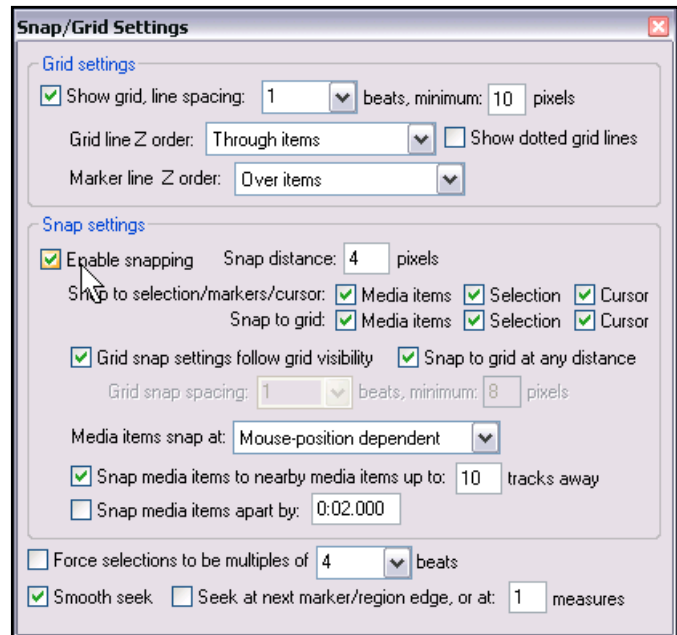
Move envelope points with media items

If enabled, this will move the envelopes along with any movement of the items that they are associated with-- Normally envelopes are statically placed on a track and stay put wherever an item is moved.

Automatically scroll view during playback

During Playback/Recording when the playback reaches the end of the screen, it will normally move to the next screen over automatically, so that you don't have to manually follow the play/record point.

However, by disabling this option, you can ensure that the media items displayed on the screen when playback is commenced will remain there during playback – the scroll cursor will just disappear off the screen. This can be helpful, for example, if you want to focus on editing a particular passage.



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Notes

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16 REAPER Plug-in Essentials

16.1 What Are Plug-ins?

There's a wonderful assortment of plug-ins supplied with REAPER. These include the Jesusonic and the VST Rea plug-ins from Cockos. In this section we will be introducing you to a selection of them. We will only be covering the very basics, just to give you a feel for what plug-ins are and how they work. Beyond this, you can explore for yourself.

Plug-ins are pieces of software that are used to control and shape the sound generated when you play back the media items in your tracks. Some simple examples of when and why you might want to use a plug-in are:

- To make a vocal recording sound nicer, more lifelike. Perhaps your dry recording sounds a bit thin, even verging on the feeble in places. Plug-ins can add body, warmth and sparkle to such a track, not by working magic, but by finding where those qualities are buried in the recording and bringing them up to the surface.
- To smooth off peaks and dips in the volume of a track, making the overall track sound more even.
- To add a "live" feel to a track or even a whole mix, making it sound more as if it were recorded in a church or a hall, rather than in a boring old studio.

16.2 The Three Laws of Plug-ins

Before you start using plug-ins, study and memorise this mantra. There are absolutely no exceptions to these laws!

1. It is better not to use a plug-in at all than to use it badly. A badly used plug-in is likely to make your mix sound worse, not better. If in doubt, underdo the use of plug-ins, don't overdo them.
2. Never, never, never judge the quality of a plug-in by how much you like its presets alone. Presets just reflect someone else's idea of how something ought to sound, not the quality of the plug-in, nor its potential. Think of it this way – would you decide that Subaru cars were no good just because the sales guy showed you a red one and you don't like the colour red? No, of course you wouldn't. At least, I hope not.
3. You can't judge the quality of a plug-in by its cost. No, really you can't. Some plug-ins are free. Some cost literally thousands of dollars. Some free ones are crap, some are great. Some plug-ins costing hundreds of dollars are, to be polite, very, very ordinary. Others are excellent.

16.3 The Three Types of Plug-in

Especially when you are new to using digital audio, the first feeling that you're likely to encounter when you start to explore the world of plug-ins is one of being overwhelmed, if not utterly confused. Why? Because there is so much choice. *Heaven help me, have I really got to understand all that lot to be able to use this recording caper?*

No, you don't. Because in essence there are essentially only three types of plug-in (well, there's an exception to that, which I'll get to shortly). These three types are:

- **Sound Shaping:** these plug-ins affect the frequency (pitch) of your track(s).
- **Time-Based Effects:** these plug-ins manipulate how your track(s) interact with time. Examples include Delay, Chorus and Reverb.
- **Volume Changing:** these are plug-ins that determine the overall volume or perceived volume of your track(s). Examples are Compressors and Limiters.

And the exception? Well, some plug-ins can cut across more than one of these categories at the same time. Performing more than one job. One example of this is a Multiband Compressor, which displays the characteristics of both an EQ and a Compressor.

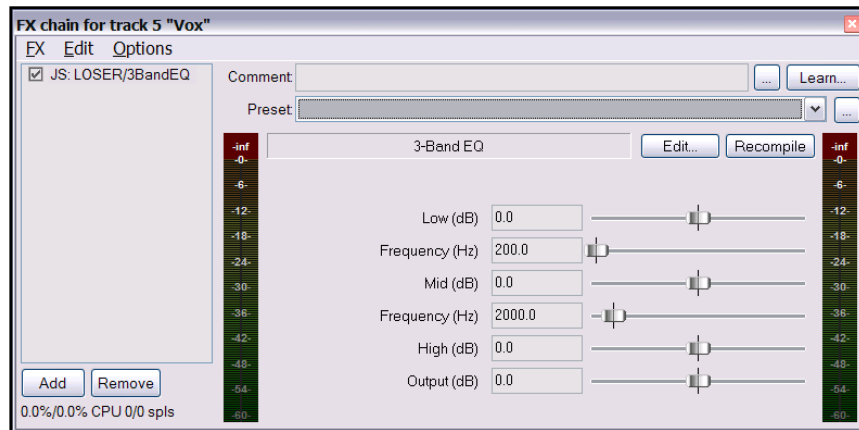
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16.4 Sound Shaping with EQ

Most sound shaping plug-ins fall (in one way or another) into the EQ category. EQ means “equalisation.” This is rather strange, since they are used to emphasise (or de-emphasise) selected frequencies. Perhaps they should be called “UnEQ”!

The best way to understand how these plug-ins work is to examine an example.

1. Open the supplied project file **All Through the Night.RPP** and save it as **All Through the Night EQ.RPP**
2. We will be working in this example only on the vocal track. The human voice is an excellent instrument for demonstrating the effects of EQ. **Solo** the **Vox** track.
3. Display the **FX** window, click on **Add** and add **JS Loser 3 Band EQ** shown right.
4. Play the song. As you do so, fade the **High** fader towards the left, all the way, slowly. Notice how the voice becomes deeper.
5. Double click on the fader to return it to the centre.
6. Slide the **Low** fader all the way to the left. Now *slowly* move the **Low Mid Frequency** fader all the way to the left, then all the way to the right. Notice the effect it has on how the voice sounds.
7. Stop the song. Return all faders to their original positions (see above).



What has been happening is that you have been cutting different frequencies out of the song at different times. Let's look at this more closely.

Exactly how you divide up the frequency spectrum is to some extent arbitrary. Here's one way that would make sense to most sound engineers:

16 to 60 Hz	Very Low Bass. These frequencies are felt rather than heard.
60 to 250 Hz	Bass. Herein dwell the fundamental notes of the rhythm section. A modest boost here can help make a sound fuller, but too much gain will make it boomy.
250 to 2000 Hz	The Mid Range. Too much gain here makes it sound like you've recorded from the other end of a telephone. If a take sounds muddy, try cutting it here.
2000 to 4000 Hz	Upper Mid Range. Often a problem area. Boost here can cause listening fatigue. Dropping this range slightly on the mix while boosting slightly on vocals can help a vocal stand out in the mix.
4000 to 6000 Hz	Presence Range. This is the key range for clarity and presence of instruments and vocals. Some gain here will bring the instrument or voice forward in the mix. A drop here can pull an instrument back.
6000 to 16000 Hz	High Range. This is where you find clarity and sparkle. Too much gain here produces a searing, glassy effect.

So .. we know that the frequency is measured in Hz (and kHz), and that we can increase or decrease the volume at any level, to shape the sound. The sound level itself of course is measured in decibels.

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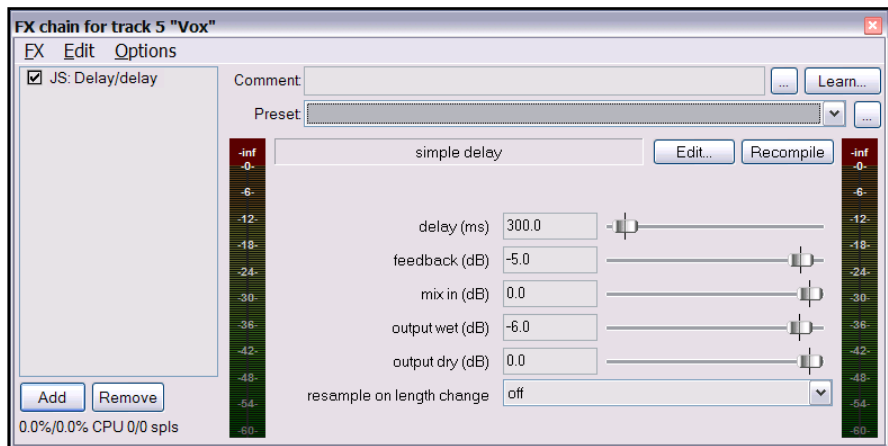
We need to understand one more term – **Q**. Q refers to the band width. A high value of Q means that you will raise or lower a very small part of the spectrum relative to your selected frequency. A low value of Q means that you will be working on a much wider part of the spectrum. In the next example, you won't need to worry about this.

Example

1. Remove from your Vox FX Bin the VST 3 Band Eq (LOSER). Insert in its place **JS:Loser/4BandEQ**
2. This EQ uses four bands. Notice that you set the frequencies yourself.
3. Play the song. Lower the last fader in this window (Output) to about -6dB. This helps prevent clipping.
4. Experiment with adjusting the frequency and levels for different bands to get the most pleasing sound.

16.5 Time Based Effects: Delay

These include reverb, delay and chorus. Sound takes time to travel through any distance, and surfaces such as walls and ceilings create reflections which make the sound patterns even more complex, intricate – and alive. Time based FX use a number of tricks and techniques to artificially simulate this, thereby creating a more “live” sound. But be careful. Too much here can ruin an otherwise good sound.



Parameter	Description
Delay (ms)	Determines the amount of time that passes between the original sound and when the delayed sound is heard.
Feedback	Determines the amount of the signal that will be fed back into the delay line.
Mix in (dB)	Determines the overall output level.
Output wet (dB)	Determines the Output level of the Post FX signal.
Output dry (dB)	Determines the Output level of the Pre FX signal.

In this example, we will look at the **JS: Delay/Delay**. This has five user adjustable parameters.

Example

In this example we are going to add some delay to the Bouzouki.

1. Unsolo your Vox track and solo the track **Gtr Body**.
2. Display the FX Window for this track and add the **JS:Delay/delay**.

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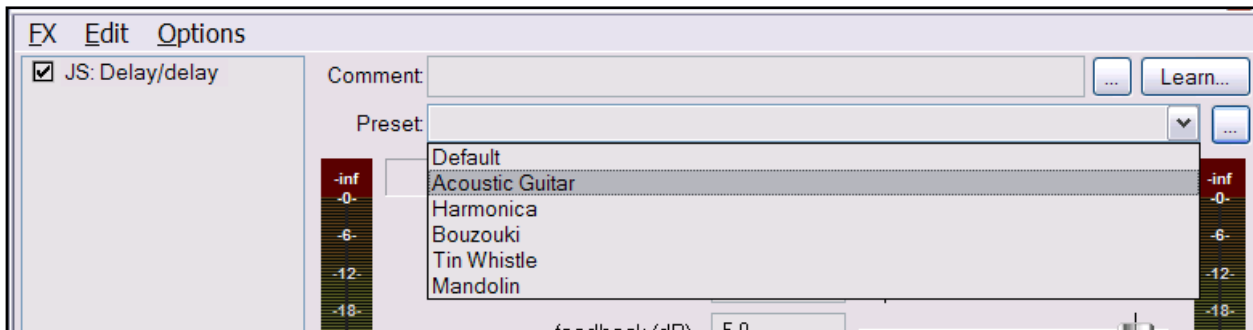
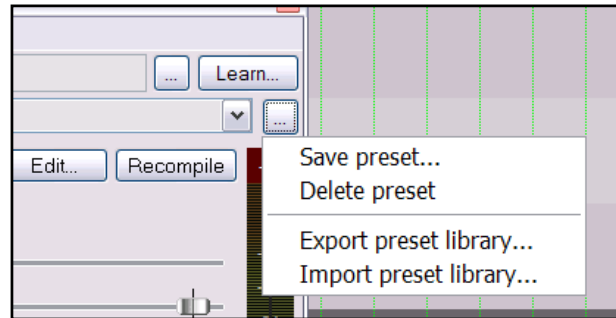
3. Play the song. Experiment with adjusting the different parameters until you have found an effect to your liking. For very small delay settings, such as 0.2 ms, it is easier to type them in the box than to use the faders.
4. Unsolo the track, then continue to make any further adjustments until you are satisfied with the results.
5. Save the file.

Creating Presets

When you are satisfied with your settings, you might wish to save them as a preset, so that you can apply them next time you record a guitar track:

1. Click on the little ... button just above the VU meter in the JS Delay/delay window.
2. Choose **Save preset** from the menu.
3. Press **Enter**.

To apply an existing preset for any track, simply insert the plug-in into that track's FX window, display the drop down list of presets, then select the one that you want:



Note: For a more sophisticated and powerful example using another Delay plug-in, see the Section titled [Full and Fat Vocals with ReaDelay](#)

16.6 Volume Changing Plug-ins: the Limiter

In this example, we will look at an example of one volume changing effect, the JS:LOSER:masterLimiter.

This can be added to the FX Window for your MASTER to perform two functions. These may at first appear to be contradictory, but they are not:

- To raise the overall volume of the mix, but at the same time
- To prevent the mix from "clipping", i.e. getting too loud at any point.

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We will be using the **JS:Loser/masterLimiter** which includes the following controls and parameters:

Parameter	Description
Threshold	This determines the level at which the other Limiter settings will be applied. It may seem paradoxical at first, but the lower the threshold, the higher will be the perceived overall volume. As you lower the threshold, more of the song will be lifted to the decibel limit that you specify.
Look Ahead	Determines how far ahead the Limiter looks – this helps smooth out sudden unexpected peaks.
Attack	Determines how quickly the Limiter kicks in as the signal increases.
Release	Determines how quickly the limiter recovers to the constant gain after a peak is encountered.
Limit	This determines the maximum volume that cannot be exceeded.

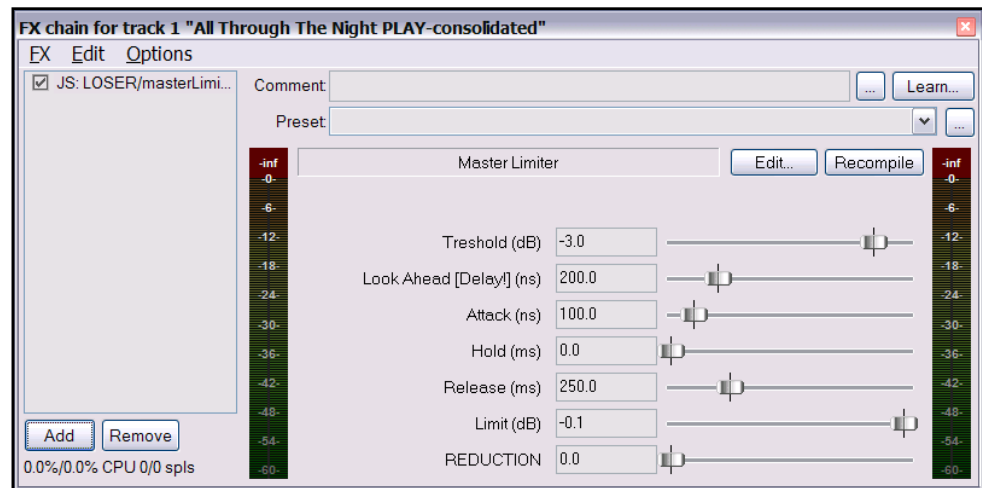
Example

1. Display the FX Window for your MASTER and insert the **JS: LOSER/masterLimiter**.

2. Play the song, adjusting the controls.

3. As you lower the Threshold, notice that the volume appears to get louder, but the maximum (limit) volume is never exceeded,

4. As you lower the Limit, the song gets quieter.



5. The more you lower both Threshold and Limit, the more you squeeze the dynamics out of the song – volume remains almost constant, and there is little or no movement in the VU.

The trick to using a limiter well is to smooth out peaks and dips somewhat, but without adversely affecting the dynamics of the song.

Now Try It! Now try some of the other plug-ins supplied with REAPER. Depending on what you're aiming to do, some you'll find useful, some you won't. Remember, above all, be gentle!

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16.7 Time Based Effects: ReaVerb

ReaVerb is a VST plug-in that is supplied with REAPER. Reverb itself is a time-based effect, and ReaVerb uses a type of reverb known as **convolution reverb** to create the illusion of space. This section will introduce you to the basics of using ReaVerb. After that, it has more features that you can explore for yourself.

Most reverbs are an artificial attempt to recreate the effect that the acoustic environment of, say, a hall or a room would have on sound. However, the mathematical process required for this is highly complex, so that very few come close to sounding like real acoustic rooms. There are probably as many bad reverb plug-ins around as there are all other sorts of plug-in put together.

With convolution reverb though, we are able to get realistic reverb without breaking the bank. It uses impulse responses of real acoustic spaces. This is made possible by generating a signal in the required environment and then recording the result.

ReaVerb even takes this concept a step further, allowing you to not only use recorded impulses from real environments to create your reverb, but also to use something closer to more traditional reverb methods to then modify that sound further, should you wish to do so.

To be able to use convolution reverb, you will need to have a collection of impulse wave files. Search the net and you'll find all you want, many free. This example uses files downloaded from

<http://www.voxengo.com/impulses/>

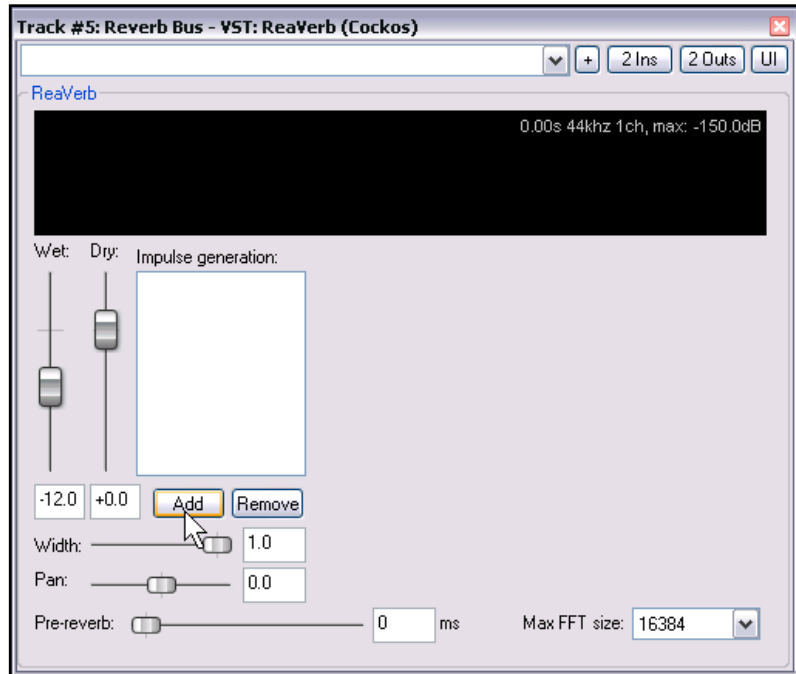
In the example that follows, these files have been downloaded and stored in a folder that we have created and named **C:\Program Files\REAPER\Reverb Impulses\Voxengo**

Example

1. Open the file **All Through the Night.RPP** and save it as **All Through the Night REVERB.RPP**
2. Add a new track after the last track, and name it **Reverb Bus**
3. Create Receives into this track from all of the instrument tracks and the Vox track. This will later enable you to feed different levels of signal, panned as required, from different tracks into your Reverb Bus.
4. Display the **FX Window** for the **Reverb Bus**.
5. Add **ReaVerb** into this FX Window.
6. Fade the **Wet** level down to around **-60** and the **Dry** level down to about **-0.5**, as shown on the right.

We will start by adding just a little reverb, then increase it as required.

7. Click on the **Add** button and then on **File**. This lets you add a file at the start of your Reverb chain. Navigate the file browser window to where your impulse files are stored and select one. In this case, we will be using **St Nicolaes Church.wav**



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8. Click on **Open** to insert that file into ReaVerb.
9. **Play** the file. In the Track Window, lower the Volume fader for the Reverb Bus to about -10dB. Lower the fader on the Master to about -6dB. You can bring this up again later if you wish.
10. In the ReaVerb window, now raise the wet signal until you hear a pleasing amount of reverb. This will probably be at about -10 dialog box. If you like, Solo the Reverb track for a while, so that you can discern the effect more clearly.
11. We can now use the ReaVerb controls to adjust the Reverb effect. The **Pre-reverb** fader offsets the reverb tail by delaying the signal that is sent to the reverb tail generator. Try it and see what happens.
12. To add more controls to the Reverb chain, click on **Add** and choose

Time/Gain/Stretch. Your window suddenly has all these extra controls.

These are used to stretch the impulse (make it longer), add in some graininess, or trim the impulse (make it shorter).

The best way to find out is to experiment for yourself.

13. Now click on **Add** again and add a **Filter (LP/HP)**.

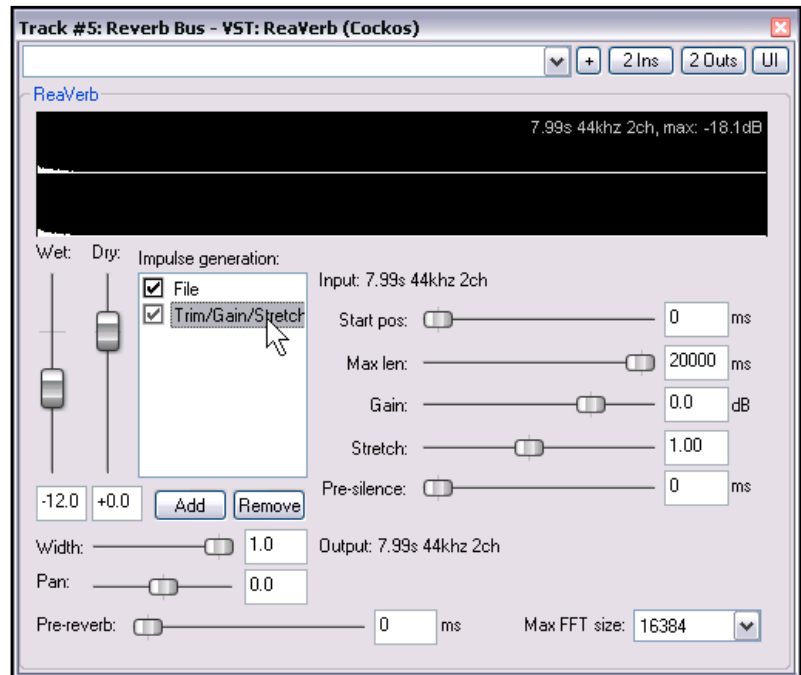
This causes a High Pass Filter and a Low Pass Filter to be added.

This can be used to force the impulse not to work above or below whatever frequencies you specify.

14. When you have a sound that you like, click on the **Save** button to save this as a preset.

Notice that when you are experimenting with ReaVerb you can:

- Drag and drop to change the order in which modules are positioned in the reverb chain.
- Untick the box to the left of any module's name to bypass that module.



ReaVerb Features Summary

Echo generator - generates an echo - useful for "filling in the gaps" of an impulse or creating echo-decay.

High and low pass filter - force the impulse not to work above or below a certain point.

Normalize - raise the gain of the impulse to 0dBFS.

Reverse - reverses the Reverb - a nifty effect for vocals, guitar solos and song intros/outros.

Trim/Gain/Stretch - stretch the impulse (make it longer), add in some graininess, or trim the impulse (make it shorter).

File - use this to insert an impulse file. You can insert as many files as you want!

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16.8 Volume Control with Compression

Earlier in this section, we encountered a **Limitter**. You can think of a limiter as being like an artificial ceiling – it essentially just stops the volume of a signal from going above whatever level you set.

Because limiting can be harsh, it's often better to use a compressor on individual tracks. Think of it this way – a limiter cuts in suddenly and severely, whereas a compressor eases itself in much more gently. It might help to get a visual picture of what limiting can do to a recording compared to a well applied compressor. The three illustrations show the same waveform as recorded, after being processed with limiting, and after being processed with compression instead of limiting.



Notice that the original waveform (left) just clips in places, going above the top line and below the bottom line from time to time.

Applying a limiter (near right) may fix this, but notice now how there is very little variation in volume. The dynamics have been largely squeezed out of the song.

The illustration far right shows the same waveform after using a compressor instead of a limiter.

The track no longer clips, and the dynamics of the recording have been largely preserved.



Software compressors vary from the simple to the complex. We're going to concentrate here on understanding just four main terms. These are essential to understanding how to use compression. There are other factors, but let's just focus on these four for now.

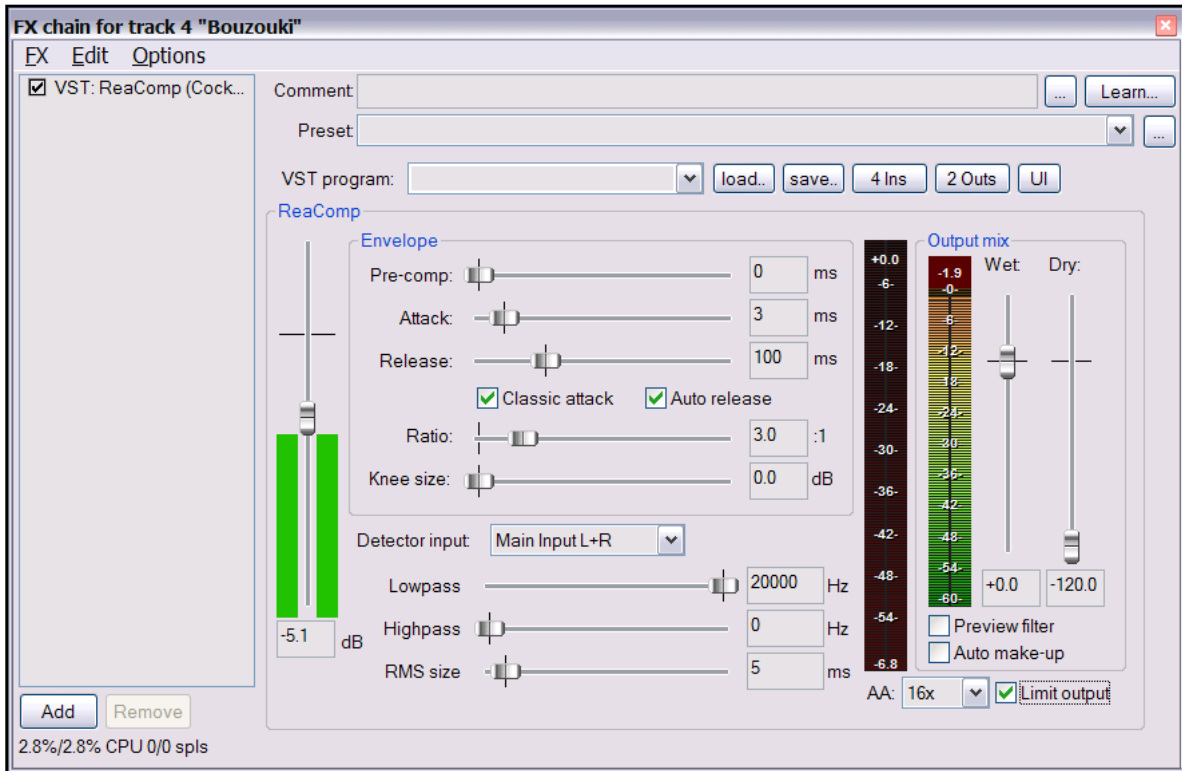
- **Threshold** - This is the volume at which the compressor will kick in. For example, if you set your threshold at, say, -10dB, then nothing below that threshold will be compressed at all.
- **Ratio** – This determines how gently or severely the compression is required. For example, a very gentle ratio like 2 to 1 would ensure that for every 2 decibels the volume of the recording goes above the threshold, the sound will be increased by only 1 decibel. A much more severe ratio of 12 to 1 would mean that for every 12 decibels the recording goes over the threshold, the sound will increase by only one decibel.
- **Gain** – This is how the volume of the track is adjusted after compression. Often you will want to raise the overall sound at least a little, to prevent the overall volume of the track from now being too quiet.
- **Limit Output** – Selecting this option will prevent the compressor output from exceeding 0 dB

Example

1. Open the file **All Through the Night.RPP** and save it as **All Through the Night COMP.RPP**
2. **Solo** the **Bouzouki** track. Look at its media peaks. You can see that it starts at a steady volume, but over the last 30 seconds or so of the song it gets rather loud.
3. Play the track from the 55 second mark for about 15 secs then stop it. During this passage, it peaks at about -5dB, but generally doesn't get above about -10dB. We could therefore try applying some compression to kick in at about -6 or -7 dB.
4. Display the FX Window for this track.
5. Insert the **VST: ReaComp (Cockos)**.
6. Create a loop to play over the last 20 secs or so of this instrument.

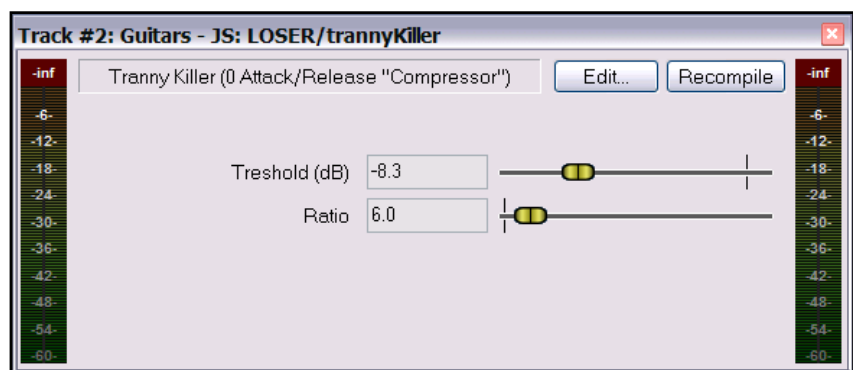
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7. As you do so, experiment with setting the Threshold (vertical fader on the left) and the Ratio. Select the option to **Limit** Output. You'll probably end up with a setting of something like -5 on the Threshold and 3.0:1 ratio (see picture).
8. Now save this file.



16.9 LOSER's Tranny Killer Clipper

Used well, a compressor most definitely can enrich a track or a mix, but used badly it can do more harm than good. If you're not yet very confident about your ability to use a compressor, then you could do worse than look at LOSER's Tranny Killer. It's a delightfully simple compressor (more like a clipper really) with just two parameters for you to control – Threshold and Ratio. All other settings are fixed.



16.10 Volume Control with a Noise Gate

Just as a compressor controls sound at the loud end of the scale, so a Noise Gate controls sound at the quiet end. Often when you record a track such as a vocal there will be sections of silence, perhaps between verses. At least, you want them to be silence! However, you might notice on playback irritating sounds have been recorded at a low level during these periods. A noise gate can be set to detect these and filter them out. Like the compressor,

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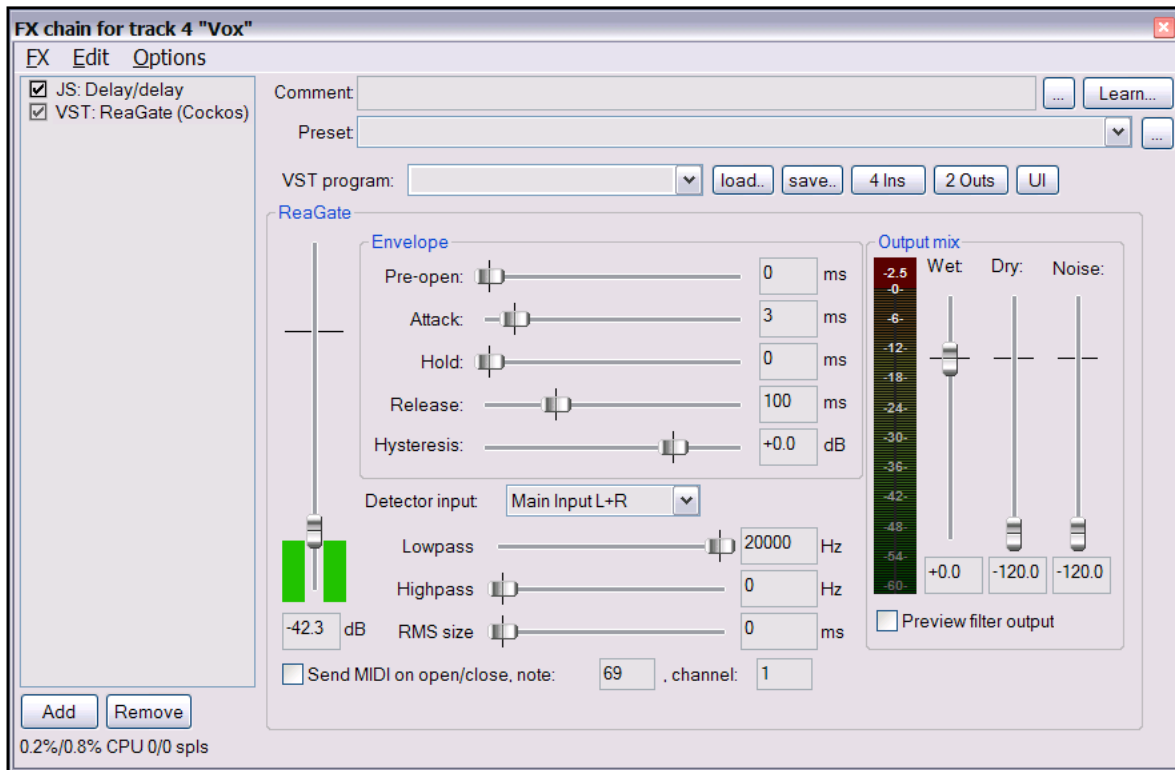
the Noise Gate can be quite simple or more sophisticated. For now, we're going to focus on just the basic Noise Gate controls:

- **Threshold** – Used to specify a minimum sound level below which the Noise Gate will kick in.
- **Attack** – Specifies how quickly the gate should kick in. Too short an attack period can cause it cutting out the natural decay of a sound you want.
- **Hold** – This specifies how long the gate remains open after the signal falls below the Threshold
- **Release** – This determines the rate at which the gate closes, once the signal has fallen below the Threshold.

Let's take an example, using the project **All Through the Night COMP.RPP**

Example

1. Solo the Vox track.
2. Play the song from just before the end of the first verse. If you listen carefully (especially through headphones) you can hear some unwanted sounds during the otherwise silent passage. Certainly you can see this on the track's VU meter.
3. Open the FX Window for this track and add **Cockos VST ReaGate**.
4. Now play the song again. Adjust the **Threshold** fader (the first on the left, so that it is set at a level just above that at which the Threshold's VU meter is peaking during the quiet passages (see below). This will shut out the sound – visual confirmation is given by the VU meter on the right, which should now display no activity.



5. You will probably find that the default settings for Attack, Hold and Release work quite well, but experiment with adjusting them if you wish.
6. Now save this file again.

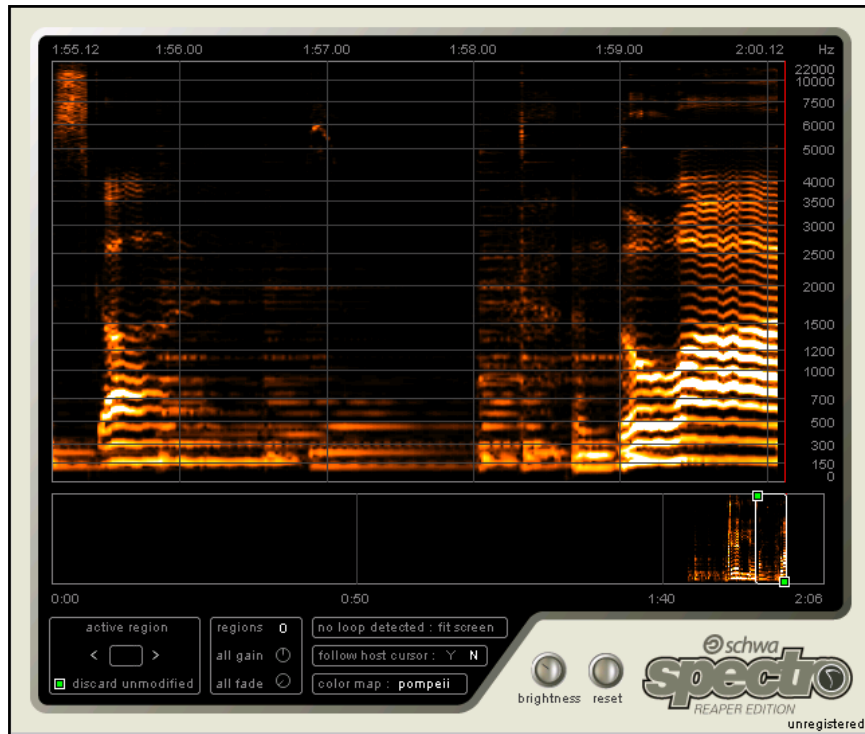
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16.11 Real Time Spectral Editing with Spectro

An evaluation copy of Stillwell Audio's **Spectro** is now included with the REAPER install package.

Spectro is a real-time spectral editor. You can use it to draw boxes around specific frequencies and make them quieter or louder, solo them, or mute them completely, and all without affecting other frequencies that are present at the same time, or solo them to filter out all other frequencies.

The plug-in is ridiculously easy to use, in addition to which a separate PDF manual is available from <http://www.stillwellaudio.com>



The illustrations on this page demonstrate one very simple but effective use of this plug-in.

In the first illustration (left), Spectro shows some unwanted sounds between about 1 minute 58 seconds and 1 minute 59 seconds. These are occurring above a frequency of about 1270 Hz.

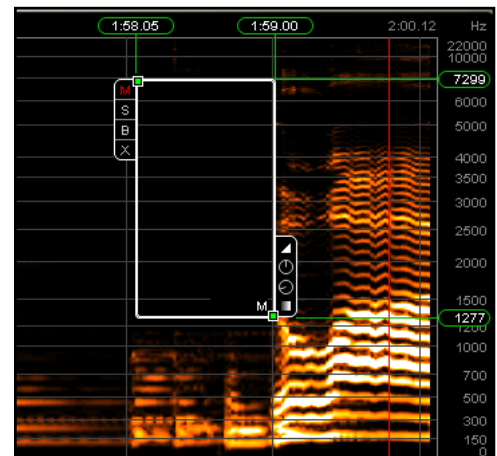
In fact, the track is a vocal one, and the unwanted sound is the singer drawing breath between phrases.

With **Spectro**, you can click and drag around the sounds in question to isolate them, and then decide what you want to do with them. In this case, we wish to mute them.

In the second illustration (right) this has been done. Notice that a box has been drawn around these sounds and the Mute option – **M** – has been selected.

Notice that **Spectro's** editing is non-destructive. This means that it doesn't actually modify the waveform in any way, only the playback. If you wanted to, you could delete the box (by clicking on the **X**) and restore the original sounds.

If you find that you use this plug-in, you must follow the instructions provided to register the plug-in, including the payment of a very modest \$25 registration fee.



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16.12 Noise Reduction with ReaFir

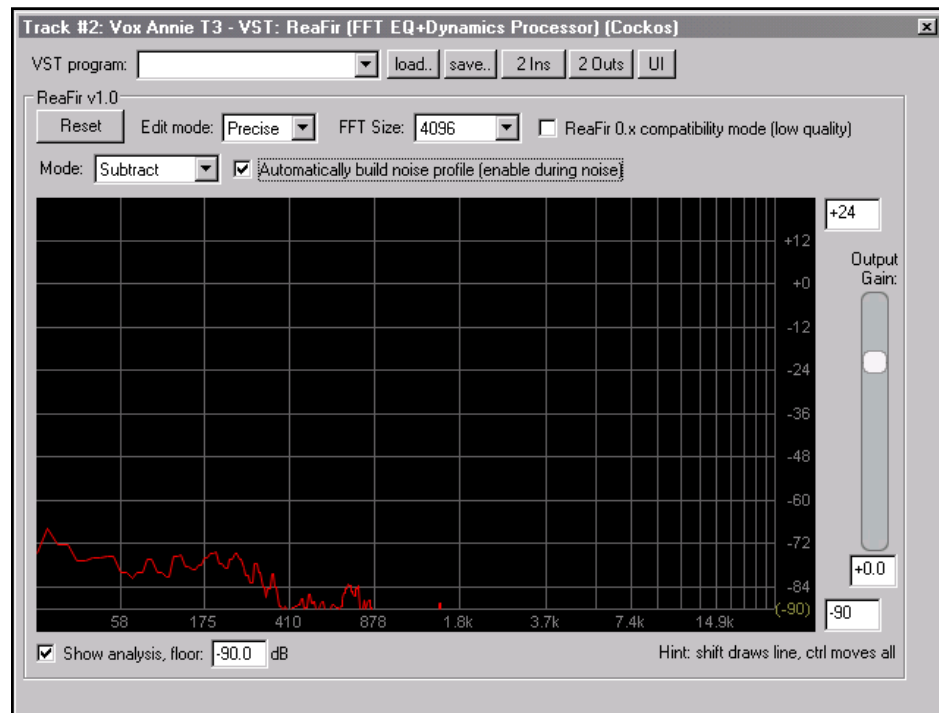
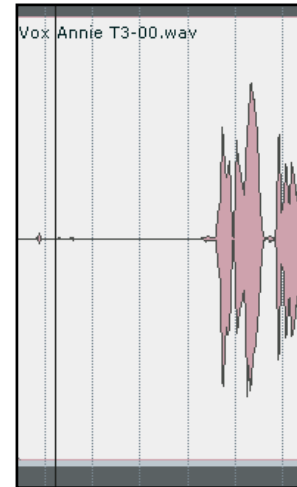
ReaFir is a multipurpose dynamics plug-in that almost defies categorisation or description. It can act as an EQ, a Compressor, a Noise Gate, and more. In this example, you will see how it can be used for noise reduction.

The need for a noise reduction plug-in can arise when an otherwise good track has some unwanted background noise on it. This might, for example, be hiss or rumble, or the sound of an air conditioner. ReaFir can be used to remove such sounds from your tracks in real time. In order to do this, you must first identify a passage on the track (perhaps a second or two) where you have recorded the unwanted noise by itself. This is likely to be at the very beginning of the track.

Example and Procedure

In overview, the procedure is this:

1. Insert **ReaFir** in the FX window of the track containing the recorded items with the unwanted noise.
2. Position the play cursor at the start of a passage containing just the unwanted noise (see illustration right).
3. Set **ReaFir** to **Subtract** mode.
4. Set Edit Mode to **Precise**.
5. Select the Option to **Automatically build noise profile**.
6. Play the track only for the duration of the passage containing the noise, then stop the playback.
7. You should see that **ReaFir** has built a profile of the unwanted noise. This will be marked with a red line (see below right).
8. Now uncheck the box labelled **Automatically build noise profile**.
9. Return the play cursor to the start of the song and play it.
10. You should now find that as the song plays, the noise that you profiled by following steps 1. to 5. has now been removed.



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16.13 Multiband Compression with ReaXComp

Applied to the Master, Multiband Compression can be a useful tool for adding body, warmth and volume to your final mix. It is outside the scope of this guide to suggest just how heavily or lightly you should apply your Multiband Compressor. Many audio engineers believe quite strongly that the contemporary trend being currently pursued by the major record companies takes multiband compression too far.

Be that as it may, a multiband compressor works by applying different rates of compression to different frequency bands. This lets you shape the sound much more precisely than is possible with a simple compressor.

The ReaXComp default settings include 4 bands. These are 0 to 200 Hz, 200 Hz to 1,000 Hz, 1,000 Hz to 5,000 Hz and above 5,000 Hz. However you can add extra bands or delete superfluous ones. You can also change the band frequencies as you wish. For example, if you increase the top frequency of Band 1 to, say, 250 Hz, then that automatically becomes also the starting frequency for Band 2.

If you have not used a Multiband Compressor before, then you are advised to start cautiously and become more adventurous as you gain in knowledge and confidence. You can experiment on any of the sample **All Through the Night** project files that you have used elsewhere in this User Guide.

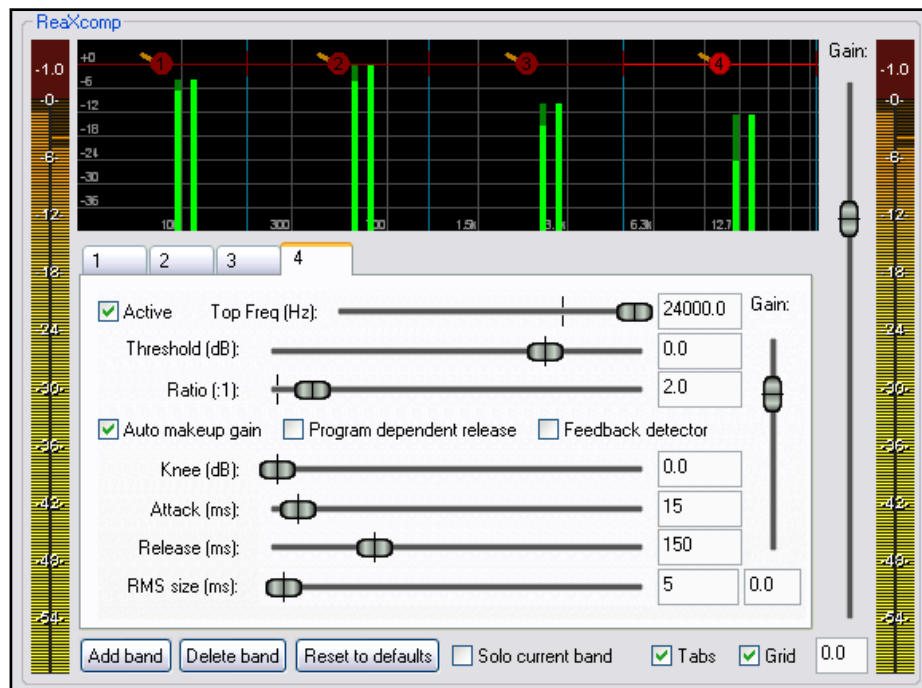
Example

1. Open one of your sample project files.
2. Insert **ReaXComp** in the FX window for the Master.
3. Play your project from the beginning.
4. It is quite likely that at this stage ReaXComp will have no effect on the sound.

This will be the case if, as shown right, the peak levels (green vertical bars) fall short of the threshold settings (red horizontal lines) for each band.

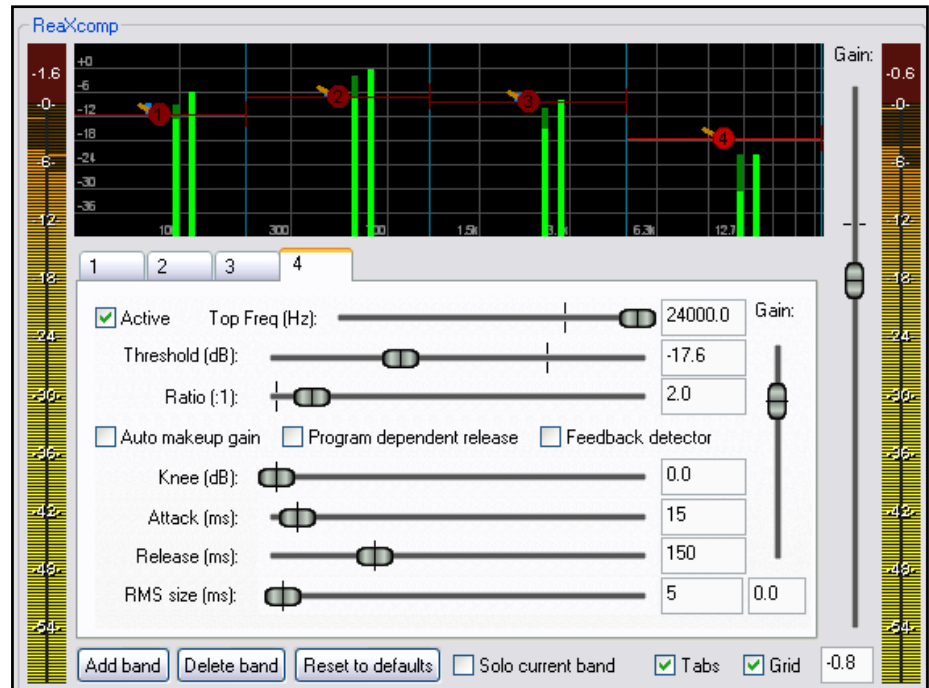
But you can still learn something!

5. Enable the **Solo current band** feature.
6. As the song plays, select in turn each of the four tabs, 1, 2, 3 and 4. This will enable you to hear separately each of the frequency ranges that you are working on.
7. Now disable the **Solo Current Band** feature.



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8. As the song plays, adjust the threshold for each of the band until they come just below the peaks for each band. An example of this is shown right.
9. The default Ratio setting of 2:1 is quite conservative. Try increasing the ratio for each of your thresholds up to around 5:1.
10. If you wish, you can experiment with the various other controls, especially the **Knee**. This setting determines how suddenly or gradually the compression is applied.
11. You can also experiment with the **Gain** controls if you wish, both for individual bands and for your overall mix.



Using ReaXComp: Some Tips

- Don't create too many bands. Too many independently compressed bands can make your mix sound disjointed. Many of the best mastering engineers have produced much of their best work with as few as three bands.
- Listen closely to the changes in sound as you adjust the various settings. One affects the other, so it is important to take your time here.
- The Attack settings determine how much time passes after the signal rises above the threshold before the compressor kicks in.
- The Releases settings determine how much time passes after the signal falls back below the threshold before the compressor is released.
- Try to adjust the Attack and Release settings so as to make the compressor come in and out unnoticed.
- Especially when first using a Multiband Compressor in the Master, it is advisable to use the Gain settings only to compensate for loss of volume due to compression, not to pump the signal up. A notable exception here might be where one bandwidth needs to be lifted or lowered slightly relative to the others.
- It is often advisable to place a limiter (such as LOSER's Master Limiter) after the Multiband Compressor in your FX Chain.
- Another, and completely, separate use for a Multiband Compressor is to compress a very specific frequency within a track, for example as a de-esser or de-popper on a vocal track.

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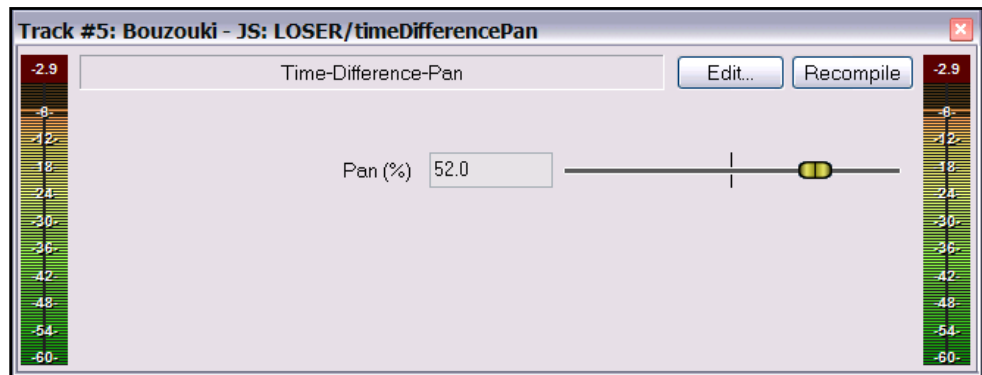
16.14 LOSER's TimeDifference Pan

Of the many (and growing number of) Jesusonic plug-ins that are supplied with (or available for use with) REAPER, LOSER's TimeDifference Pan definitely merits a mention. It is delightfully simple to use, but very effective.

Sometimes you may feel that a track you have recorded sounds rather "thin" or "wimpish". You'll want to fill it out a bit, or fatten it up to make it sound richer, warmer, fuller. In this case, one old trick is to duplicate the track and run the duplicate track a few ms behind the original, panned differently. Fed back into the main mix, this can almost make the one instrument sound like two instruments at times.

LOSER's TimeDifference Pan plug-in effectively does all this for you – with much less time and trouble on your part, and with very, very little CPU overhead.

If you want to experiment with this plug-in to try out the effect for itself, the **Bouzouki** track on **All Through the Night.RPP** lends itself to this quite well.

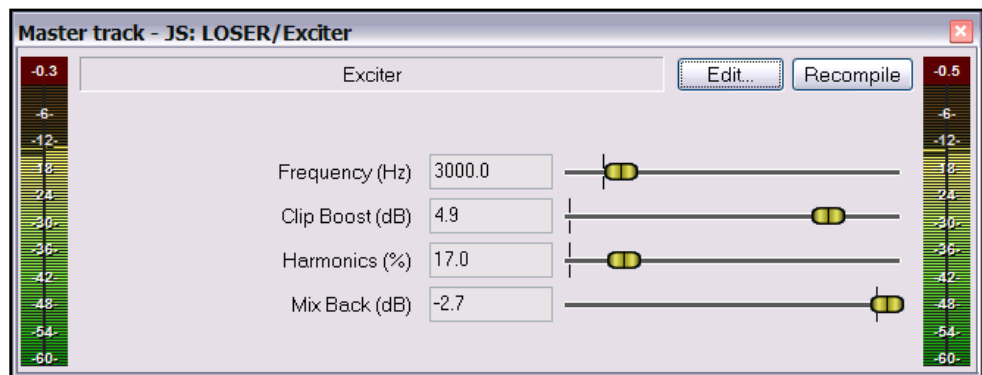


16.15 LOSER's Exciter

LOSER's Exciter plug-in is a great but simple way of putting some high end sparkle back into an otherwise muddy sounding mix

Of course, where possible, it is better to fix problems with individual instruments or tracks, but even after doing that you may still find that your mix lacks a certain vitality.

Place the Exciter at or near the beginning of the Master FX chain and see for yourself. Note these settings:



Frequency – the frequency above which you want to add the sparkle. Try experimenting in a range of about 2000 Hz to 4500 Hz. Sometimes, you may need to go even higher for the best results.

Clip Boost – the amount by which you wish to boost the volume above this frequency.

Harmonics – the amount of Harmonics you want to add to the mix (go easy on this one).

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16.16 Some Guitar FX Plug-ins

There's a whole series of Jesusonic plug-ins especially designed to help you shape your guitar sounds. By and large, they work in much the same way as your guitar pedals do. Here is a selection:

Plug In	Description
JS Guitar/amp-model	Lets you select an amplifier to be simulated, such as a Fender or a Marshall. Lots of parameters for you to tweak!
JS Guitar/chorus	The waveform is fed through a series of delays whose delay times are slowly modulated. The shape of the chorus sound is moulded primarily by the Length, Number of Voices, and Rate settings.
JS Guitar/distortion	This plug-in works by distorting the shape and frequency content of the waveform. The degree of distortion applied is determined principally by the Gain and Hardness settings.
JS Guitar/flanger	Flanging is an effect that occurs when a signal is mixed with a delayed copy of the signal, while the delay time continually changes. The flange effect is basically set by adjusting the Delay Length, Rate and Feedback parameters.
JS Guitar/phaser	This four allpass filter stereo phaser effect settings include Rate (Hz), Range (Min and Max), and Feedback.
JS Guitar/wah	The wah effect is also a filter effect, produced by the combination of the Position, Top Resonance, Bottom Resonance and Filter Distortion settings.
JS Guitar/tremelo	A tremelo effect is produced by a low-frequency variation in a sound's amplitude envelope. This is determined by setting the Frequency (Hz) and Amount (dB).

If you use more than one effect on a guitar, then the effect is of course cumulative, and the order in which you apply them will determine how good (or otherwise) the outcome is. As a starting point, a suggested order is:

Filter (such as Wah or Phaser)

Compressor

Distortion

EQ

Pitch Change (such as Vibrato)

Modulator (such as Flange or Chorus)

Level Controller (such as Tremelo or Limiter)

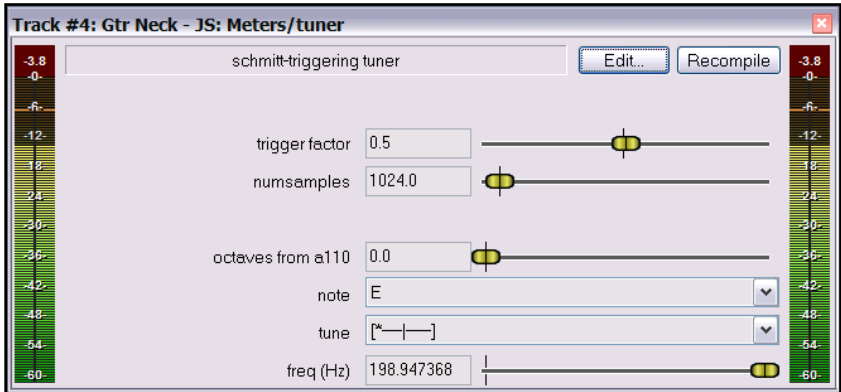
Echo (such as Reverb)

Of course, we are not suggesting that you will want to use all these effects at once! If you do use more than one effect, however, the above is a good starting order. This does not mean that you shouldn't hold back from experimenting with other FX ordering, to see what creative sounds you can produce!

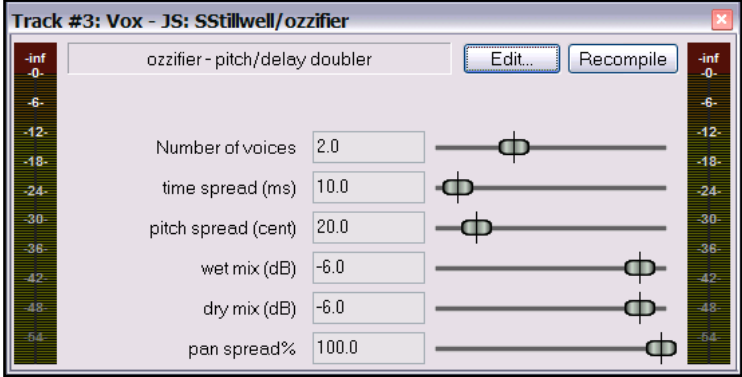
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16.17 Some Other REAPER JS Plug-ins

This last part of this section will give you an overview of some of the other wonderful Jesusonic plug-ins supplied with REAPER. It is only a small selection, and the fact that any plug-in isn't included in this table in no way implies that it is inferior to any of those that are included.

Plug In	Description
JS Filters/dc_remove	A DC offset removal plug-in.
JS IX/StereoPhaseInverter	Offers four choices, Normal Phase, Invert Left, Invert Right or Invert Both.
JS IX/PhaseAdjustingRouter	A stereo phase inverter with the addition of selectable input and output channels. This can be used, for example, to create a fuller, more vibrant sound from a single mono track.
JS LOSER/DDC	A custom designed compressor suitable for use with Digital Drums.
JS LOSER/SPLimiter	A simple peak limiter with a single control, Threshold. This can be used to prevent an individual track from clipping.
JS LOSER/StereoEnhancer	Used to create an enhanced stereo effect in a stereo track, folder, bus or Master.
JS LOSER/Waveshaping Distortion	A delightfully easy to use plug-in that adds distortion to a track.
JS Meters/tuner	<p>Insert this into a new track and arm for recording, then tune your guitar.</p> 
JS Meters/vumeter	Insert this into any particular track when you want monitor its VU levels closely.
JS autopeakfilter	A neat plug-in that lets you create autowah type effects.
JS Misc/tonifier	An interesting plug-in that creates sound effects by shifting pitch or frequency for audio blocks of a determined size.
JS Pitch/superpitch	One of a number of plug-ins that can be used to change pitch.

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Plug In	Description
JS SStillwell / ozzifier	<p>Especially good for fattening or doubling a vocal track.</p> 
JS SStillwell/expander	<p>The opposite of a compressor! Can restore dynamics to a mix that sounds overcompressed. This works by <i>raising</i> the volume of the signal when it falls <i>below</i> a given threshold.</p>
JS SStillwell/hpflpf	<p>Adds a high pass filter and low pass filter to a track or Master. Useful, for example, for removing bottom end rumble.</p>
JS SStillwell/hugebooty	<p>Adds a touch of bottom end (bass) to a track.</p>
JS SStillwell/width	<p>A stereo enhancer plug-in.</p>
JS Utility/dither	<p>Add this at the end of your Master FX chain to reduce distortion when rendering from 24 bit down to 16 bit. Dithering works by actually <i>adding</i> some low level hiss to the signal!</p>

16.18 Third Party Plug-in Presets

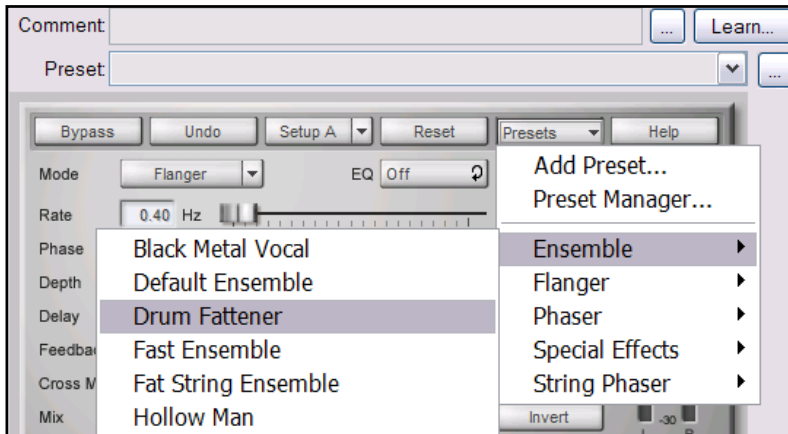
You can use your favourite third party VST and DirectX plug-ins with REAPER, such as Sonitus, Wave Arts, Sony, and so on.

Most of these plug-ins are supplied with a number of Presets. It's worth noting that the method of accessing these plug-ins will vary depending on such factors as the plug-in's native interface and the type of plug-in (for example, whether VST or DirectX).

In this section, we will look at three examples. Armed with this information, you should be able to figure out where to find the presets for any of your plug-ins.

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Example 1



This example (left) is of a popular DirectX Sonitus plug-in, Modulator.

In this case, the plug-in interface includes its own native **Presets** section. Clicking on that (shown left) displays a menu of supplied presets.

You can also store your own presets here if you wish, as the Sonitus range of plug-ins includes its own preset manager.

Notice that you can also use REAPER's own Preset Library to store your presets.

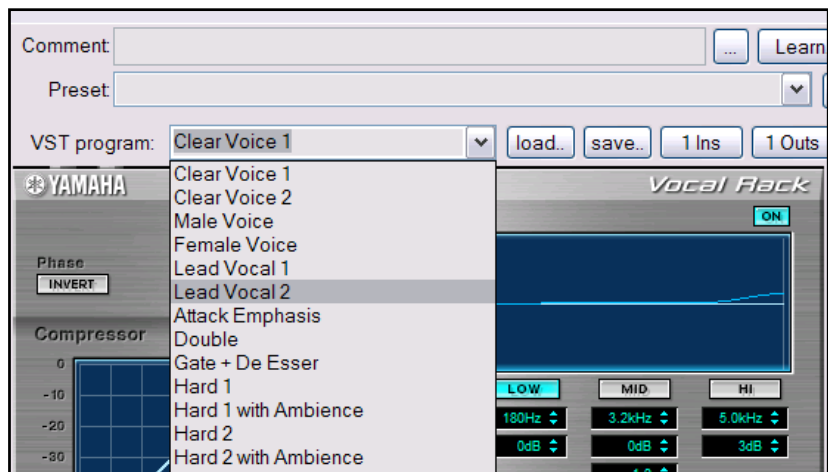
This is accessed by clicking on the small button (with the three dots) shown just below the Learn button.

This is especially useful when you are working with plug-ins that might not have their own native Preset Manager.

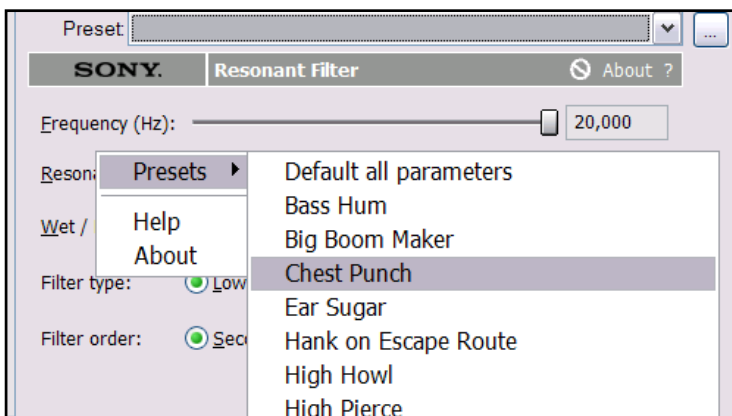
Example 2

This example (right) shows a Yamaha VST plug-in, Vocal Rack.

This plug-in does not have its own native preset manager. However, you can use the REAPER VST program interface to display and access the various presets that come with this plug-in.



Example 3



A Direct X plug-in this time, Sony's Resonant Filter.

In this case, native presets do not appear when clicking on the REAPER Preset drop down list arrow. This will only display any presets that you have created yourself.

In this example, right-click over any vacant area of the plug-in's GUI interface to display a list of factory presets,

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16.19 Creating and Managing Your Own FX Presets

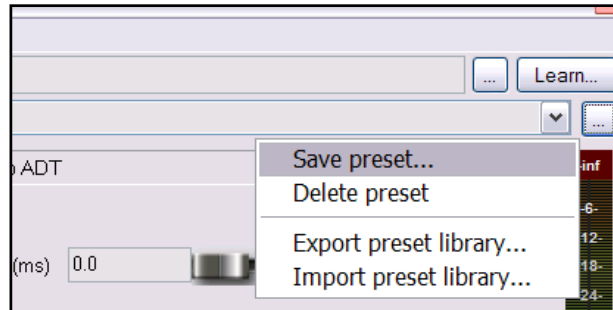
You can create your own FX presets for any plug-in. This will enable you to easily recall and apply those settings that you use the most frequently. The procedure is as follows:

- Insert the relevant plug-in into the FX window of any track.
- Adjust the plug-in parameters to suit.
- Click on the ... button in the FX Window (just below the **Learn** button).
- From the context menu, choose **Save preset**.
- Give the preset a name then click on **OK**.

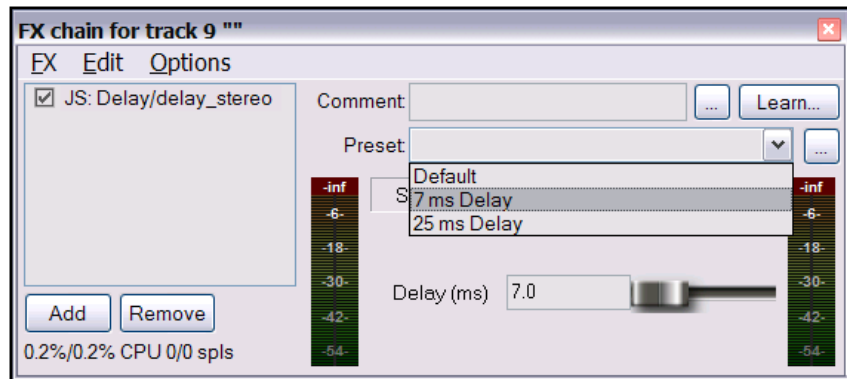
Use this method to create as many presets as you wish for the plug-in. At any time you can again click on the ... button and use the **Export preset library** command to save all your presets for this plug-in into a file. This is especially useful if you wish to make a backup of your presets, or to use these presets with a copy of REAPER on a different PC or workstation. In that case, you can click on the ... button and choose **Import preset library** to import the presets for use on that computer.

Example

1. Open the file **All Through the Night.RPP** and save it as **All Through the Night FX PRESETS.RPP**
2. Open the FX Window for any track.
3. Insert into that FX Window the plug-in **JS: Delay/delay_stereo**.
4. Set the Delay time (ms) to **0.0**
5. Click on the ... button then from the menu choose **Save preset...**, as shown right.
6. Type the name **No Delay** then click on **OK**.
7. Now adjust the Delay Fader to read **7.0**.



8. Repeat steps 5. and 6. above, this time naming the preset **7 ms Delay**.
9. Now adjust the Delay Fader to **25.0**.
10. Again, repeat steps 5. and 6. above, this time naming the preset **25 ms Delay**.
11. If you wish, create some more presets in the same way.



12. Notice that you can now select and apply any of your Presets from the Preset Drop Down List (see above).
13. Your presets will now be available for use with this plug-in for any track in any project. If, however, you wish to keep a backup (or to transfer them to another computer), you can click on the ... button and use the **Export preset library** to save your presets into a .RPL file.

Note: A .RPL file is a text file and can be edited with Notepad or another text editor. This can be useful if you wish, for example, to change the names of some of your presets.

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Notes

The Other Stuff

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17 More REAPER Routing Examples

This section is mainly intended for reasonably experienced users of DAW software, to show you some of the more clever aspects of REAPER's routing that are probably different from anything you've experienced before. But hey, if you're a complete newb, have a look anyway if you like. You might find it interesting.

17.1 Controlled Bleed

Bleed is a term used when material intended to be recorded on to one track manages to overflow onto others. This commonly happens:

- When more than one voice or instrument is recorded at the same time, each with its own microphone. For example, you might record a person singing and playing an acoustic guitar at the same time, perhaps one vocal mike, one guitar mike. However, you will find that some of the vocal will bleed through on to the guitar mike, and vice versa.
- With layered recording, when the headphones are so loud, or ill-fitting, that the microphone being used for recording actually picks up some of the output of the headphones.

Headphone bleed is bad, period. If, for example, you have an artist who likes to hold one headphone to her ear while overdubbing a vocal, then make sure the mix is sent to that ear only. Happily, REAPER's flexible routing makes this simple.

In the example shown (right), output from the Master is directed to both Speakers, but only one headphone.

The other kind of bleed, which we will call *live recording bleed*, can actually have some benefits. If all microphones are positioned carefully and correctly, it can produce a warmer, fuller more natural sound than is often obtainable from layered recording. (Layered recording is where each track is recorded one at a time).

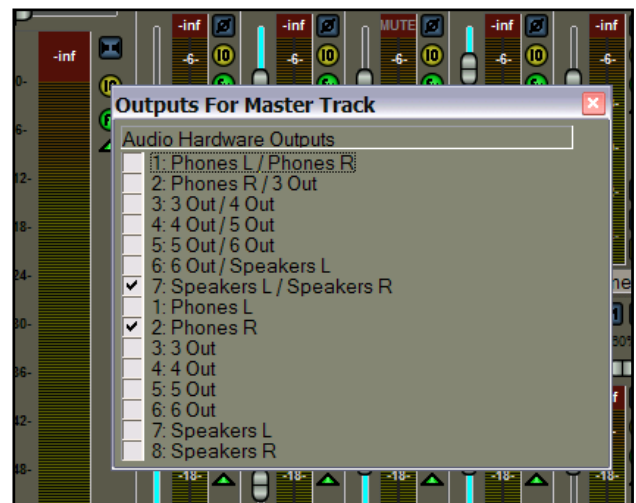
The trouble is, the "all at once" method of recording it also has negatives – serious ones. For example:

- It isn't possible to drop in and overdub a short passage to correct perhaps a vocal phrase or a couple of bars on the guitar. Basically, the whole track has to be recorded again each time. Everything.
- It isn't possible in mixing to get the best sound for each track. For example, if you need to add some presence or compression to the vocal track, then you will also be adding it to the guitar bleed in the same track.

This is where REAPER's routing capabilities can be so useful. They allow you have the best of both worlds – the richer, fuller sound that you can get from adding a small amount of controlled bleed, but without the disadvantages.

Here's how it works:

- Use layered recording, to ensure that each track is recorded cleanly.
- Use REAPER's routing capabilities to add a little bleed where you want it, after any FX in the FX chain.

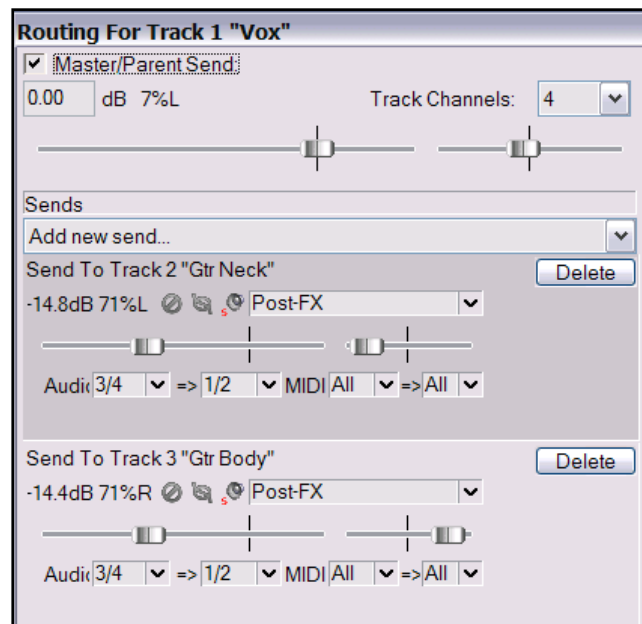


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Example

This example demonstrates a simple use of routing to create a *controlled bleed* effect.

1. Open the file **All Through the Night.RPP** and save it as **All Through the Night BLEED.RPP**
2. Mute the Bouzouki track. To keep this example simple, we won't be using it here.
3. Select the **Vox** track, right click over the Volume fader and set the number of channels to 4. Display the **FX Window** for the **Vox** track. Add a Reverb FX of your choice. If you don't have any Reverb plug-ins, several good free ones can be found on the Internet. In this example, we are using a freeware FX called **Glacerverb**. If you want it, use Google to find a download site.
4. After inserting the Glacerverb plug-in (or whatever you are using), adjust its settings to suit.
5. Display the **I/O Window** for the Vox track.
6. Add **Sends** from the Vox (Channels 3/4) to both Guitar tracks, as shown. Pan these sends at about 70% left and right respectively, about -15dB, and Post FX (see illustration).
7. Play the song, with the Vox track muted. Adjust the Send levels of Vox to both Guitar Tracks so that the Vox can only just be discerned in the very background.
8. Unmute the Vox and play again. The Vox should sound fuller and richer than before.
9. Save the file.



Now try this!

Remove the Reverb FX from the vocal track.
Remove the sends from the **Vocal** Track to the **Guitar** Tracks.
Create a new track called **Vox Reverb** and insert a Reverb FX of your choice.
Create a send from your **Vox** track to this **Vox Reverb** tracks.
Create sends from the **Vox Reverb** track to both **Guitar** tracks, Post FX.
Play the song, adjusting Send, Pan and Volume levels to suit.

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17.2 Nested Folders

Nested folders refers to the practice of creating folders inside folders (or sub-folders). You can create these quite easily using the method outlined here.

An example is shown on the right.

In this example, we have created two separate normal Track Folders, each of which contains two tracks. Notice that we have disabled the send from each of these to the Master. Instead, in each case we have added a send to a new track.

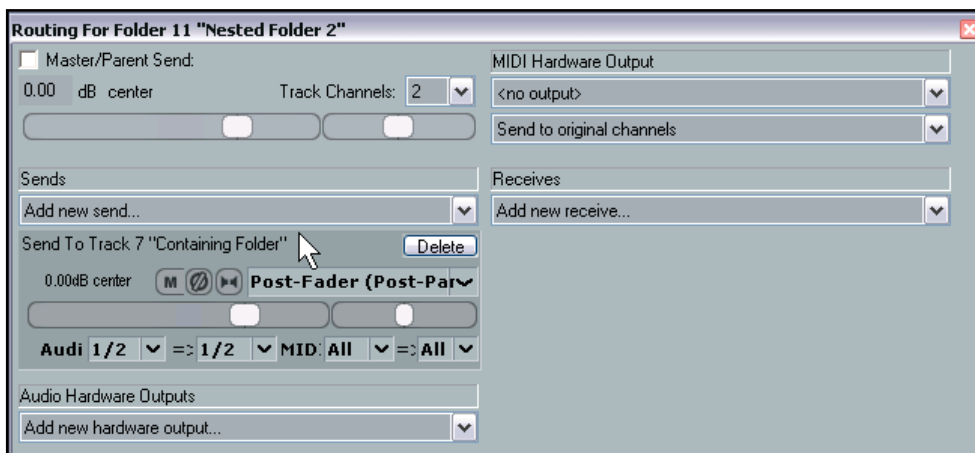
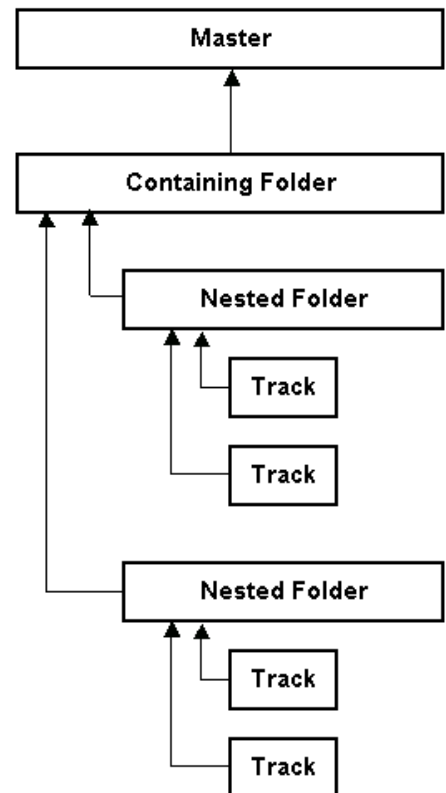
In the flow chart, the new track is labelled **Containing Folder** and each of the original folders is labelled **Nested Folder**.

The I/O Routing Window for one of the Nested Folders is shown below:

Notice that the **Master/Parent Send** has been disabled, and a **Post Fader** send has been created to direct then output instead to the track labelled **Containing Folder**.

This ensures that the controls (Pan and Volume) for each of the nested folders will determine how the mix that is sent to the Containing Folder.

This method of routing offers you the flexibility to create virtually as many levels and sub-levels of folders as you need.



The Routing Window for the other nested folder will be similar to this one shown here.

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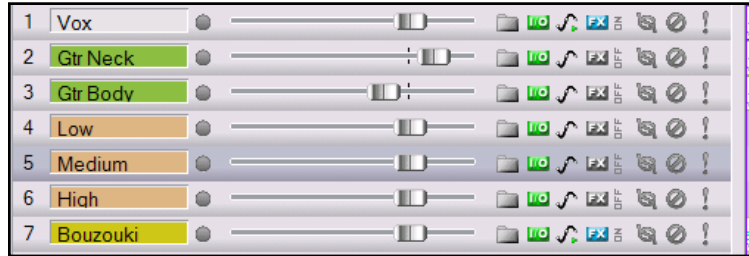
17.3 Splitting Channels

This example will introduce you to a feature in REAPER that possibly delivers you more mixing power than any other single item: the ability to create and use multiple channels.

Doesn't sound very interesting or exciting does it?

It's not an easy concept to understand at first, so, just for fun, we'll take as simple an example as we can to introduce the concept.

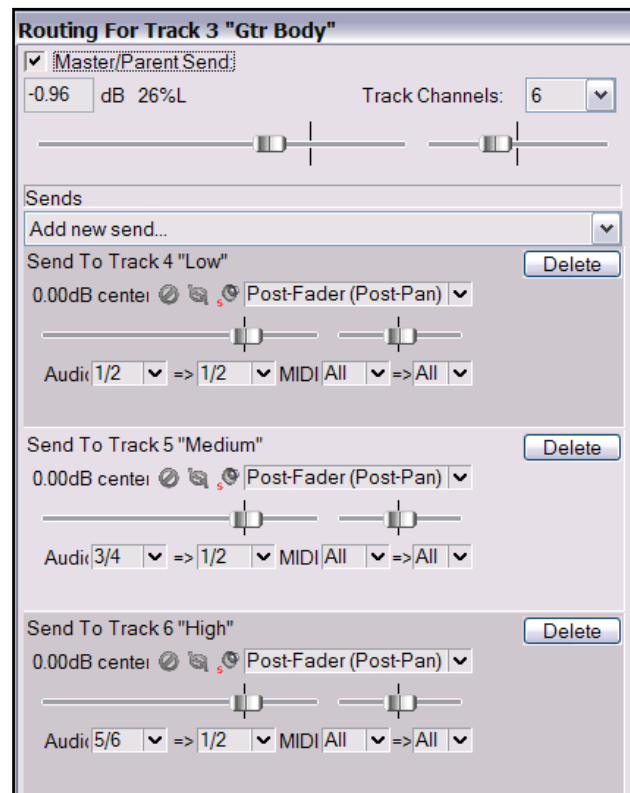
You have an acoustic guitar track recorded. You should by now have a general idea at least about how to shape its sound with EQ, or fatten it with a little delay. But in this example, we're going to take it to another level, so, for example, we can split the recorded track by different frequency bands into, say, three different paired channels, and perhaps pan different frequencies differently, or add some trailing delay just to one channel (i.e., one selected frequency range).



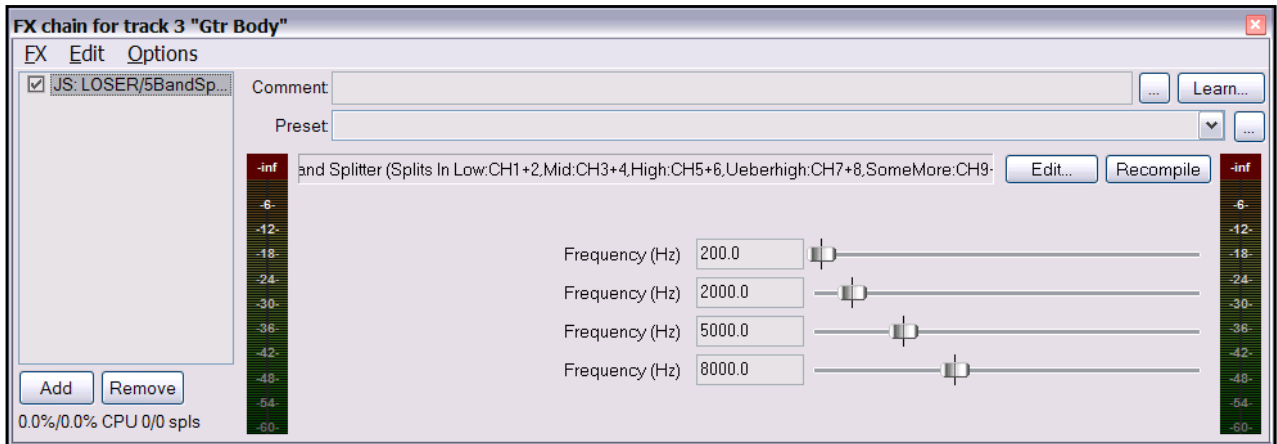
Why would you want to do this? With this particular example, maybe you would, maybe you wouldn't. But being able to create and use channels in this way opens up endless mixing and editing possibilities. We'll start with this example because it's a fairly simple one, and it will help you to understand how it's done. The later, we'll look at a more complex case.

Example

1. Open the file **All Through the Night.RPP** and save it as **All Through the Night Channels.RPP**
2. We are (for the purpose of this example) going to work only with the track **Gtr Body**. **Mute** all other tracks except this. To do this, hold the **Alt** key and click on the **Mute** button for this track.
3. We now are going to create three tracks – let's call them *Ghost Tracks* – to mirror each of the three bands that we are going to split our **Gtr Body** track into. Create these three tracks and label them **Low**, **Medium**, and **High**. See illustration above right.
4. Display the **IO Window** for the **Gtr Body** track. Set the number of **Channels** (near the top) to **6**, and create sends to each of the three tracks that you have just created.
5. Send Audio from **Channels 1/2** to the **Low** track, **Channels 3/4** to the **Medium** track, and **Channels 5/6** to the **High** track. (see illustration right).
6. Getting complicated? Then make sure that your **Routing Matrix** is in view.
7. Now open the FX window for the **Gtr Body** track and insert the **JS LOSER/5BandSplitter**.

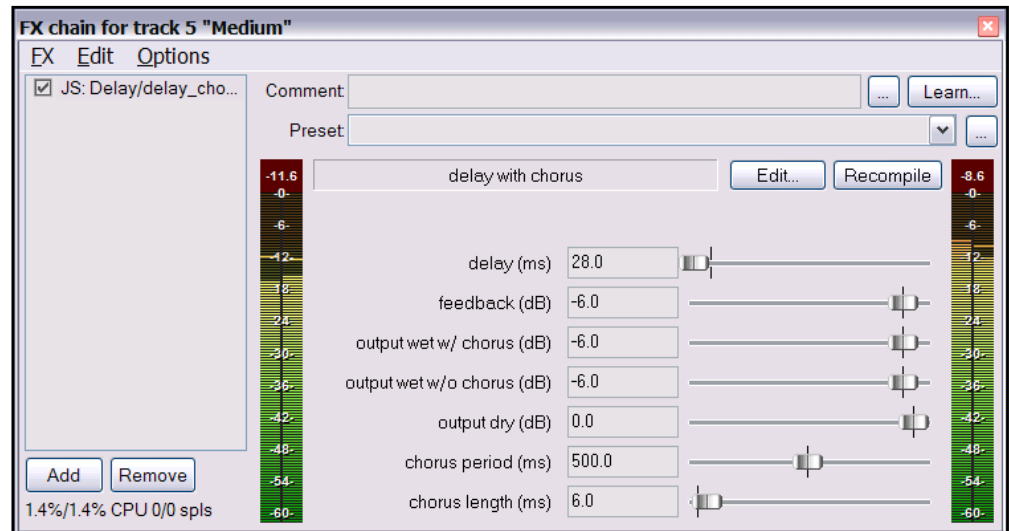


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8. Solo the **Low** track and play. Notice you hear only the Low frequencies.
9. Unsolo the Low track, then Solo the **Medium** track and play. Notice you hear only the Medium frequencies.
10. Unsolo the Medium track, then Solo the **High** track and play. Notice you hear only the High frequencies.

11. Experiment adjusting the faders in the 5 Band Splitter and playing back, until you are satisfied with your settings.



12. Now select the **Medium** track, open its FX bin and add **JS:Delay/ delay_chorus**. Adjust the settings to suit.
13. Now unsolo any solo tracks, unmute any muted tracks to restore all tracks to your mix. You'll probably want to fade down the original Gtr Body track somewhat.
14. Make any further adjustments you want to your **Delay Chorus** settings . An example (but only an example) is shown above.
15. Experiment with panning the three bands differently, to create a fuller sound.
16. Save this file.

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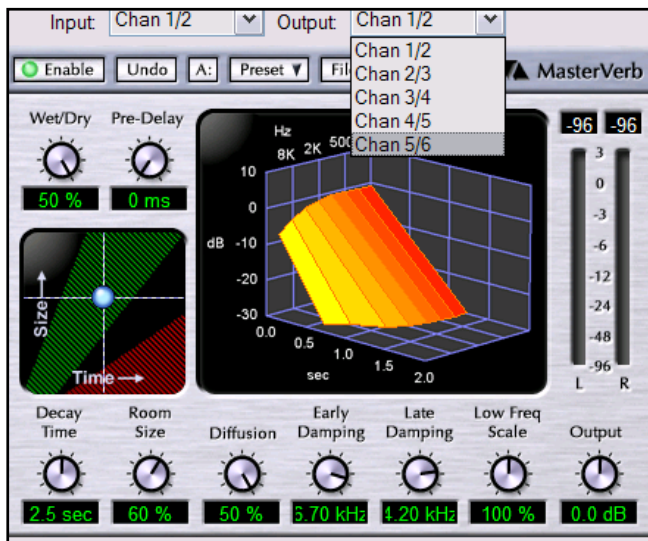
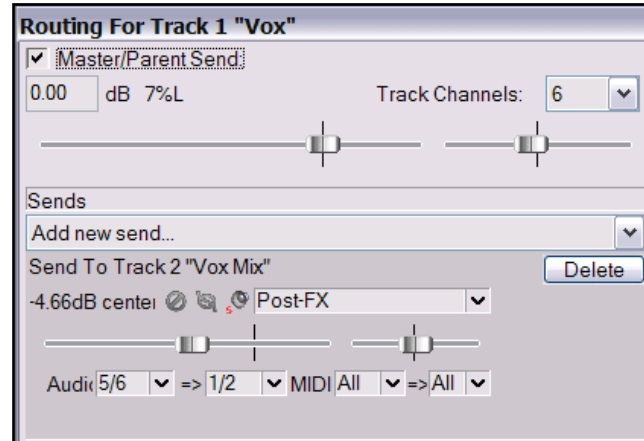
17.4 Selectively Routing FX

Notice that when you are using multiple channels you can also apply a track's FX selectively to certain channels. In the example shown here, channels 5 and 6 are used to send a signal from a track called **Vox** to another track **B Vox Mix**, where that track is a submix of a number of vocal harmony tracks.

We have also added to the **Vox** track a reverb effect, in this example using WaveArts Mastervverb. Of course you could use any other third party VST Reverb plug-in.

Notice, however, that we have specified that the reverb effect is to go out to Channels 5/6.

This ensures that the reverb will not be added to the vocal track itself, but will instead be mixed in with some of the original vocal and then added to the vocal harmonies in the **B Vox Mix** track.



But what if we just want to send some of the reverb from the original Vox track to mix in with the vocal harmonies, without also sending any of the original dry signal there?

That's easy! All you would do is this.

1. Create a **Vox Reverb Bus** and add a send from your Vox track to this Reverb Bus.
2. Add the Reverb FX to the FX Window for this Reverb Bus. Select whichever reverb parameters you require, making sure that Wet/Dry mix is set to 100% Wet.
3. Display the I/O Window for the Reverb Bus. Disable the output to the Master, and create a send from this bus to the Vocal Harmonies Submix.

Don't be afraid to try things out and to experiment to get the best results.

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17.5 Full and Fat Vocals with ReaDelay

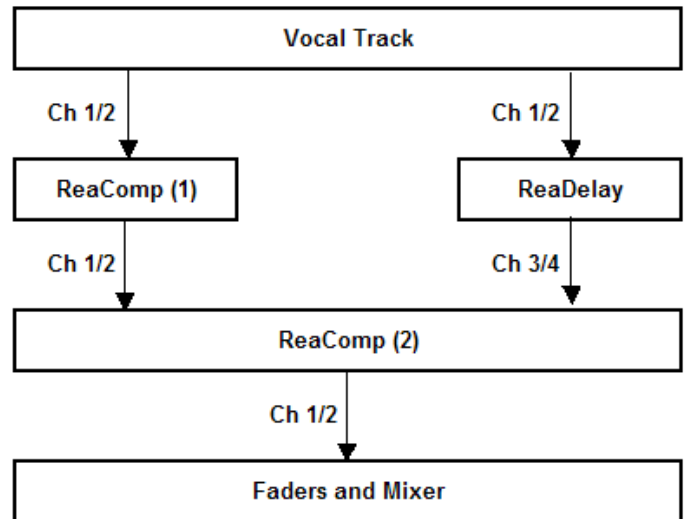
This next example shows how you can combine REAPER's channel splitting capabilities with the ReaDelay plug-in to create a simple effect for fattening up thin vocals.

The flow chart on the right illustrates how this can be done. The signal flow shown has this effect:

- It uses ReaComp to apply some compression to the main vocal.
- It creates a sidechain which is fed into the ReaDelay plug-in to fatten the original sound and to fill it out.
- The delayed signals are then mixed back in with the original signal, where further compression is then applied.

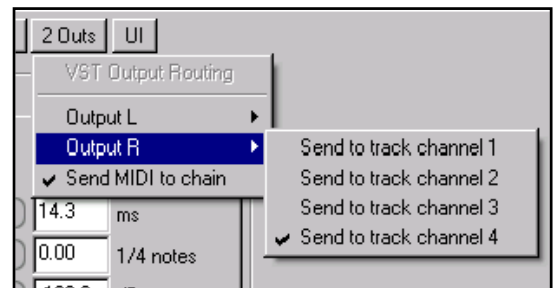
Of course, if you wish, you could apply more FX to any or all of:

- The original dry recording.
- The sidechained and delayed signal.
- The final mix of the dry and sidechained (delayed) signals together.



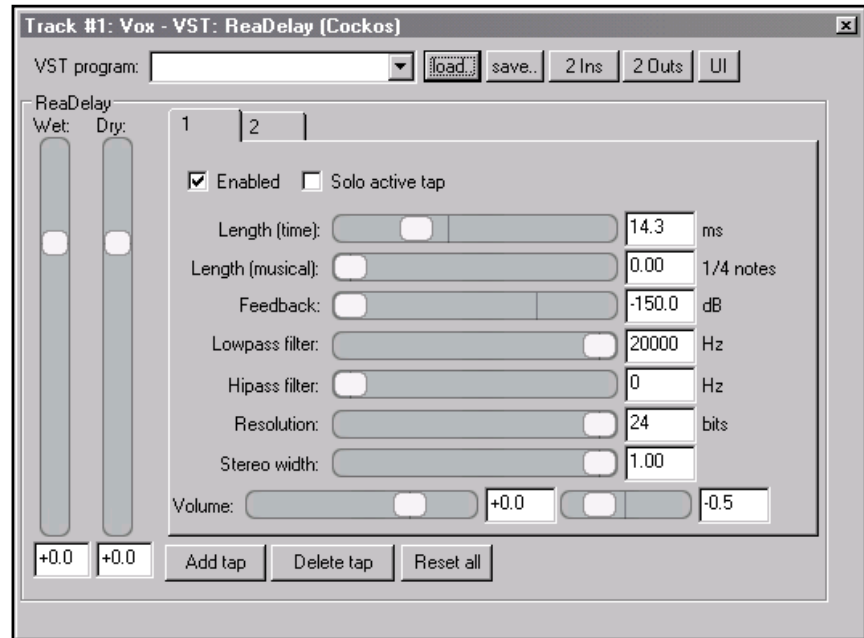
Example

1. Open the file **All Through the Night.RPP** and save it as **All Through the Night READELAY.rpp**.
2. Solo the **Vox** track. For the purpose of this example, we will be working with the vocal track alone.
3. Display the **I/O** window for this track and set the number of track channels to **4**.
4. Open the **FX Window** for this track. If there are already any -plug-ins already in the chain, remove them.
5. Now insert **ReaDelay** into the FX chain.
6. Leave the **Inputs** at their default (Channels 1 and 2), but adjust the **Outputs** so that they are **Channel 3** (Left) and **Channel 4** (Right), and *only* these two channels.
7. Click on the **Add Tap** button to add a second page.
8. Set Page 1 to a Delay Length of about 14ms or 15 ms.
9. Set Page 1 Panning to about 50% Left. This shows on the fader as -0.5. See the illustration at the top of the next page.
10. Set Page 2 to a Delay Length of about 6ms or 7 ms.
11. Set Page 2 Panning to about 50% Right. This shows on the fader as 0.5.
12. Make sure that both pages are **Enabled** and that neither is soloed.

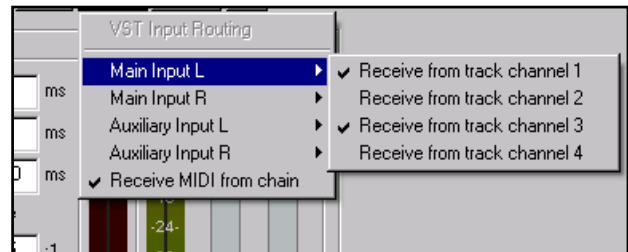


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13. Insert **ReaComp** into the FX Chain. Leave the Main Inputs and Outputs both at their default settings, which are Channel 1 (Left) and Channel 2 (Right)
14. Set the **Ratio** control to about **6:1**. Adjust the **Threshold** control so that during the louder passages **Output** is reduced by about 6 or 7 dB.
15. Now insert another instance of **ReaComp** into the FX Window.
16. If you wish, you can rename your ReaComp instances to avoid confusion.



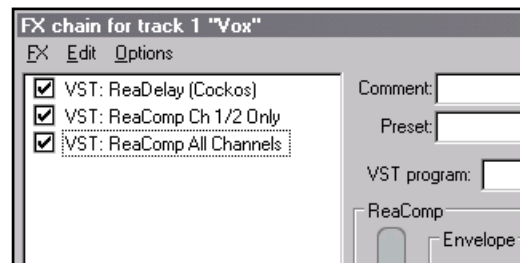
17. For the second ReaComp instance, set the Main Inputs to Channel 1 and Channel 3 (left) and Channel 2 and Channel 4 (Right).
18. Leave the Output at its default, which is Channel 1 (Left) and Channel 3 (Right).
19. Set the **Ratio** at about 2:1.
20. Play the vocal track. Adjust the **Wet** a **Dry** output levels from **ReaDelay** to suit.
21. Select the second **ReaComp** instance. Adjust the **Threshold** so that during the louder vocal passages the **Output** is reduced by about 2.5 dB to 3 dB.
22. When you have finished experimenting, save the file.



Note:

In this example, the order in which the FX are applied is significant.

With the order that we have used, the sidechained (delayed) signals do not go through the first compressor, with the result that these signals retain more of their original dynamics.



Tip: Any time that you set up a configuration (such as this) which you are likely to want to use again, don't forget that you can save it as a **Track Template**.

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17.6 Channel Splitting and Pitch Shifting

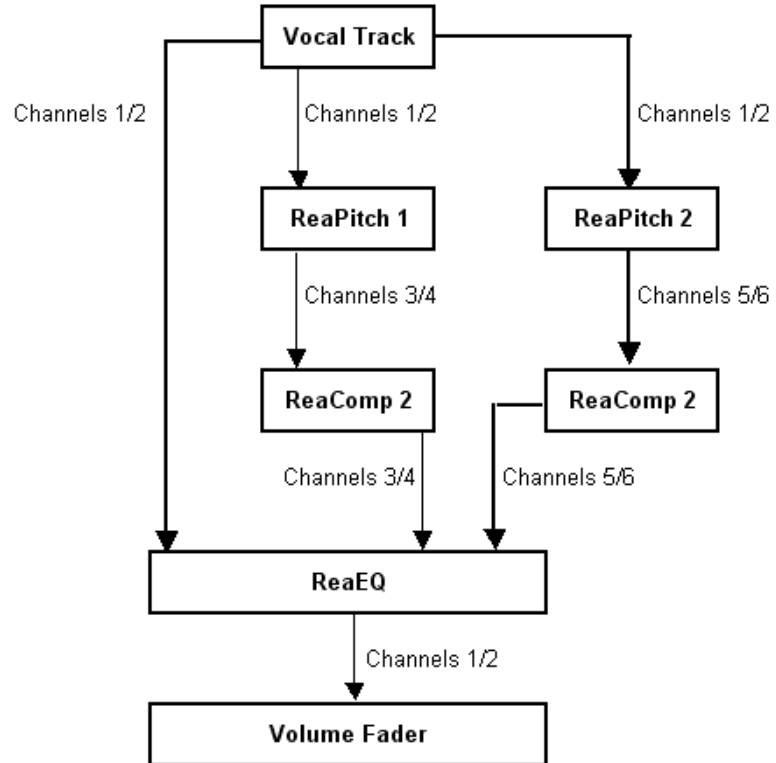
You've already seen how ReaPitch can be used, for example, to create vocal harmonies from a lead vocal track. In this example you will see how by splitting our vocal track into several channels you can create a whole vocal ensemble, with different FX and plug-ins being applied to different harmony parts.

This is especially useful, for example, if you want to compress your vocal harmonies before lowering them, to make them sit smoothly and subtly behind the lead vocal.

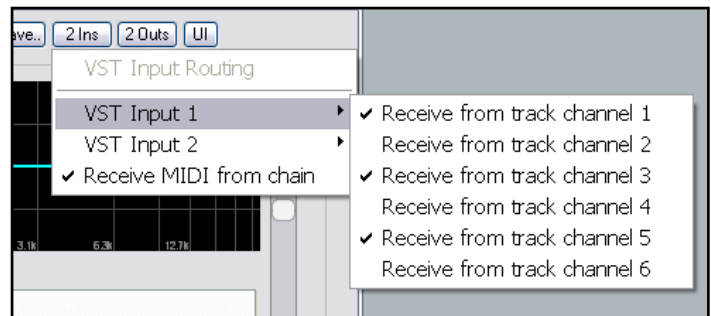
The illustration (right) demonstrates this concept.

In summary, this is what happens:

- The Vocal Track is assigned six channels.
- Two instances of ReaPitch are inserted, and the signal from channels 1 and 2 is fed to both of these.
- The output from the two ReaPitch instances are directed via channels 3 and 4 and 5 and 6 respectively to two separate instances of ReaComp.
- In each case, you will need to specify Channels 3 and 4 (ReaComp 1) and Channels 5 and 6 (ReaComp 2) as the input source for your compressors. Auxiliary Inputs should be set to nothing, and the Output channels should be the same as the Input Channels.
- The output of the two compressors is sent to a single instance of ReaEQ, as is the original signal on Channels 1 and 2. In order to do this, you should make Input 1 for ReaEQ Channels 1, 3 and 5 (see illustration right), and Input 2 should be Channels 2, 4 and 6.
- The three streams are joined back together at ReaEQ, from which they are fed to the volume fader.



Note: Set Auxiliary Inputs in both ReaComp instances to nothing. Use Main Inputs to drive both compressors.



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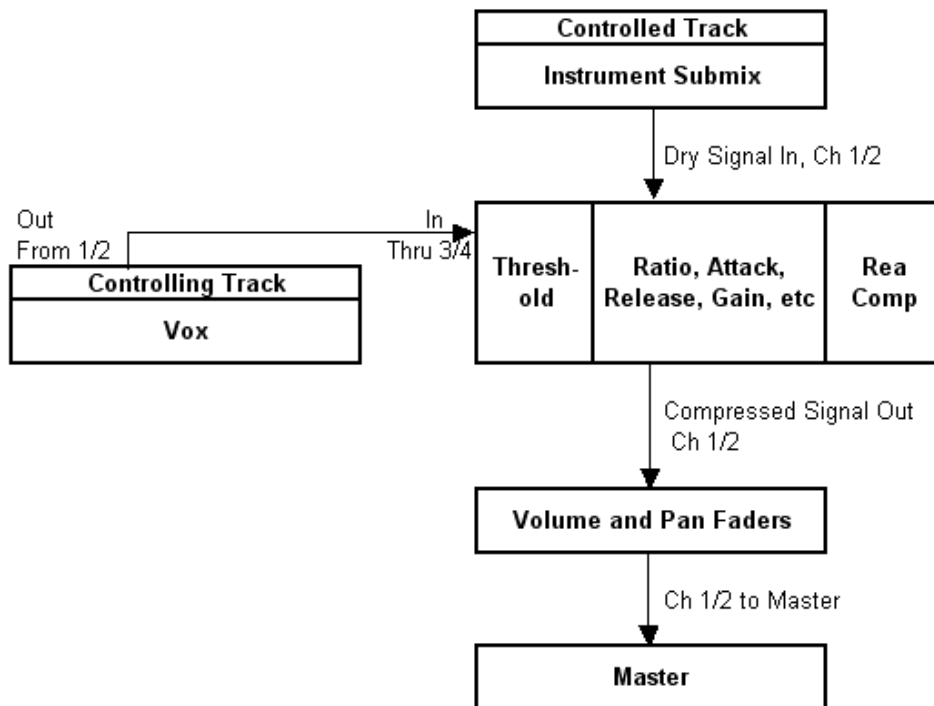
17.7 Audio Ducking

The next example in this section will show you how to use REAPER's routing capabilities to create an effect known as **ducking**. Put quite simply, this is a term which describes what happens when a compressor is set up to ensure that the volume on one track is automatically lowered whenever the volume on another track is raised.

You might want to do this, for example, when working with a kick and a bass. In this example, we'll use the Bouzouki, Guitar and Vocal tracks in our sample project, just to show you how it's done. We will use audio ducking to ensure that the overall volume of the instruments are automatically lowered slightly whenever there is a signal on the Vocal track. This helps lift the vocal track slightly above the mix. In order to do this, we use multi channel routing in conjunction with the ReaComp compressor.

The illustration below illustrates the concept of how we use sidechaining to achieve our ducking effect.

Sidechaining Flowchart



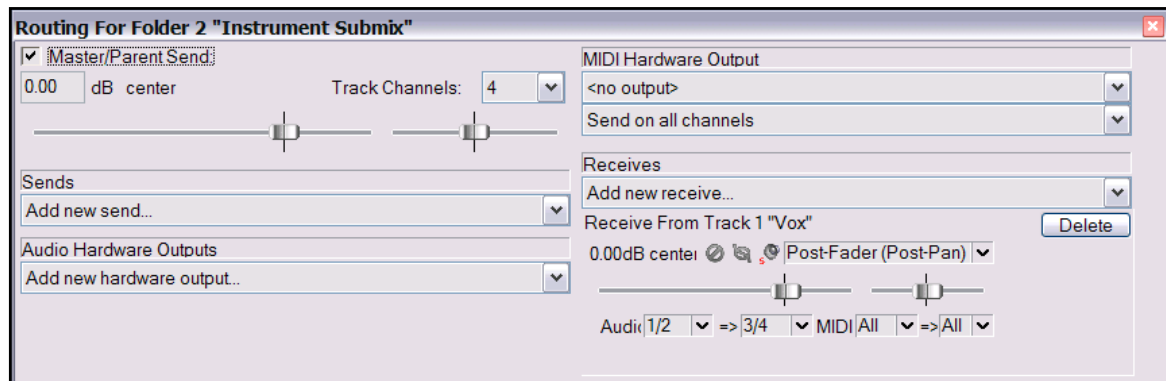
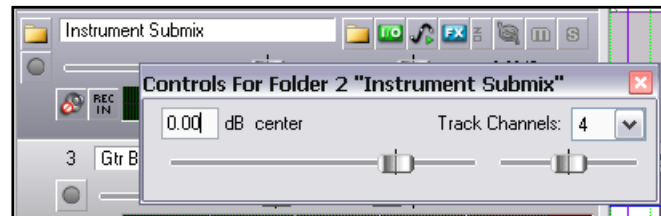
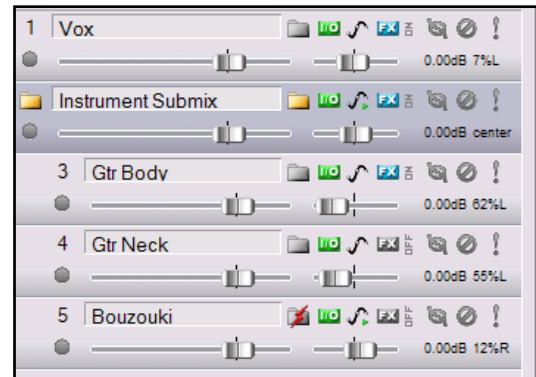
Let's take it step by step.

Example

1. Open the project **All Through the Night.RPP** and save it as **All Through the Night DUCK.RPP**.
2. If there are any tracks other than **Gtr Body**, **Gtr Neck**, **Vox** and **Bouzouki**, delete them, so that you are left with just these four tracks.
3. If necessary, rearrange track order so that **Vox** is Track 1, **Gtr Body** Track 2, **Gtr Neck** Track 3 and **Bouzouki** is Track 4.

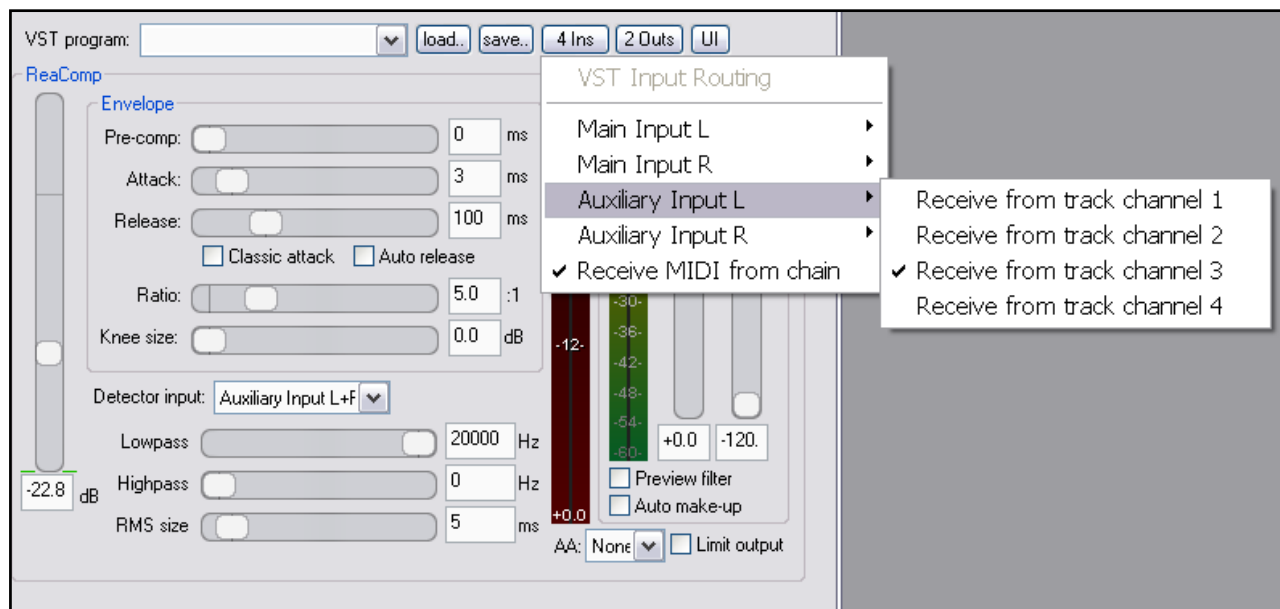
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4. In the Track Control Panel, select the **Vox** track and press **Ctrl T** to insert a new track after this. Name this new track **Instrument Submix**.
5. Click on the **Folder** icon to make this track a folder. Click on the **Folder** icon also for your last track to make it the last track in the folder. See picture right.
6. We need to add two more channels to the **Instrument Submix** track so that it can receive a sidechain signal from the Vox. Right click over the Volume fader for this tracks in turn, then set the number of channels to four. See picture below right.
7. We now need to create a sidechain to enable the various instrument and **Instrument Submix** track to detect the signal level of the Vox track.
8. Display the **I/O Routing Window** for the **Instrument Submix**, then create a **Receive** from the Vox track. Direct the signal in via Channel 3/4, as shown below.



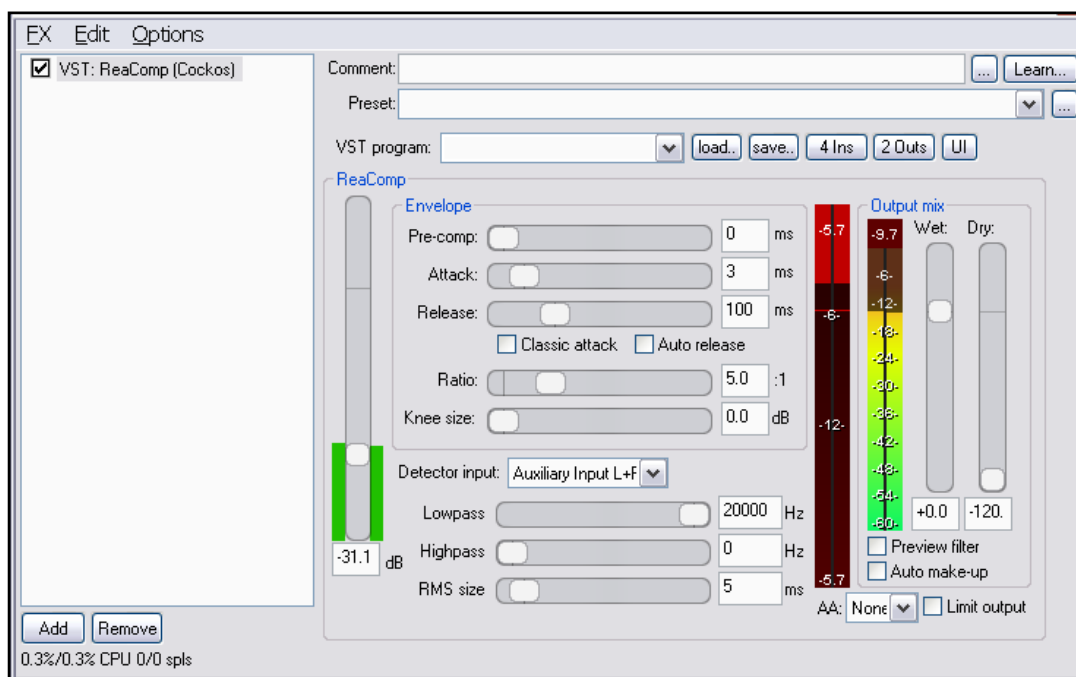
9. Next, display the FX window for the Instrument Submix Track. Add the **Cockos** plug-in **VST: ReaComp (Cockos)**
10. Notice that this plug-in includes an item called **Detector input**. This is where we tell REAPER that we want the Vox level, not the Bouzouki level to control when the compressor kicks in. This Detector input offers two basic choices – **Main Input** and **Auxiliary Input**.
11. We need to make sure that Main Input is defined as the media on the Submix track itself (Channels 1 and 2), and Auxiliary Input is defined as the stream coming from the Vox track on Channels 3 and 4.
12. Click on the **4 Ins** button and if they are not already set, set the assignments as Main Input L- Receive from Channel 1, Main Input R - Receive from Channel 2, 0 Auxiliary Input L – Receive from Channel 3, and Auxiliary Input 4 – Receive from Channel 4.
13. Now display the **Detector Input** drop down list and select **Auxiliary Input L + R**. The settings should now be as shown below.

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14. Now play the song. Adjust the **Threshold** (first vertical fader) downward, so that during Vocal passages the VU meter peaks above the fader level (see below), then slide the **Ratio** fader right until you are satisfied with the overall amount of reduction on the Instruments. This will probably be somewhere between 4:1 and 6:1.

You should be able to see the flashing red bar to the left of the Output VU. This indicates the amount of reduction that is occurring on the submix track. In the example shown below, this is -5.7 db.



15. Save the file.

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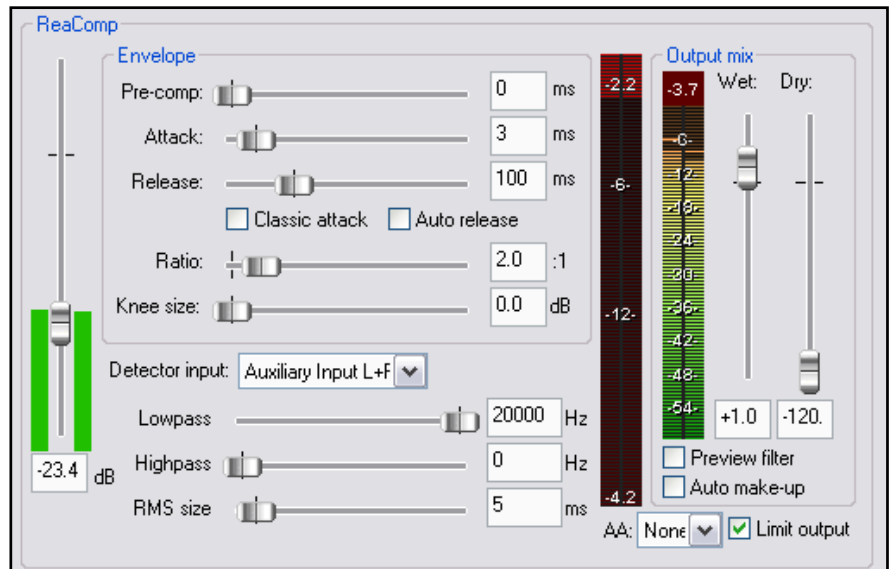
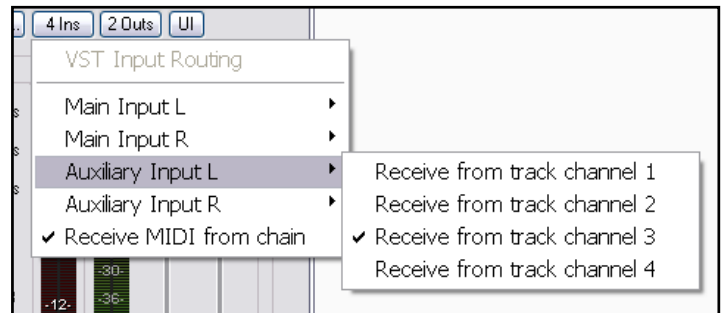
17.8 Double Ducking

This example should only be attempted *after* you have completed the example in the previous section **Audio Ducking**. It builds on the work you did there, to apply a further instance of sidechaining, this time to the Master. We will set up another instance of ReaComp, this time in the Master Track, to ensure that another layer of gentle compression is applied to the entire mix during the vocal passages. The same audio stream is used to apply ducking in two different ways – hence the term *double ducking*. As with many of the other examples included in this section, the main purpose of this example is to help you to understand how to use REAPER's routing capabilities. The example itself is of secondary importance.

In the previous example, we used a send from the Vox track to Channels 3 and 4 on the Instrument Mix track and then used these as Auxiliary Inputs to gently compress the Instrument Mix. Because the Instrument Mix is itself being routed to the Master, that Vox track send will automatically also be sent to the Master on Channels 3 and 4.

Example

1. Open the file **All Through the Night DUCK.rpp** and save it as **All Through the Night DOUBLE DUCK.RPP**.
2. Select the Master Track. Click on the **I/O** button for the Master and ensure that the number of Channels is set to four. (In fact, it should automatically already be set to four). Close the I/O window.
3. Display the **FX Window** for the Master Track and insert **ReaComp**.
4. Make sure that the Auxiliary Input L is set to Channel 3 (see right) and Auxiliary Input R is set to Channel 4. These should already be the default settings.
5. Set the **Ratio** to around 2.0 to 1. Display the **Detector Input** drop down list and select **Auxiliary Input L + R**.
6. Play the song. During the vocal passages, adjust the left hand vertical Threshold fader so that the compression kicks in gently. Raise the vertical **Wet** fader by about a decibel. Make sure that **Limit Output** is selected. An example of how your settings might look is shown. (right).
7. That's it! You can now save your file.



You can use sidechaining in conjunction with a number of REAPER plug-ins, including ReaGate, ReaXComp, ReaComp and ReaFir.

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17.9 ReaSamplomatic and ReaDrums

This example uses the **ReaSamplomatic** plug-in provided with REAPER in conjunction with the **ReaDrums** track template created by **jamester**. You can download the ReaDrums Lite template from <http://www.cockos.com/forum/attachment.php?attachmentid=1517&d=1177898356>

After downloading, it should be copied into your Track Templates folder, **C:\Documents and Settings\User Name\Application Data\REAPER\TrackTemplates**

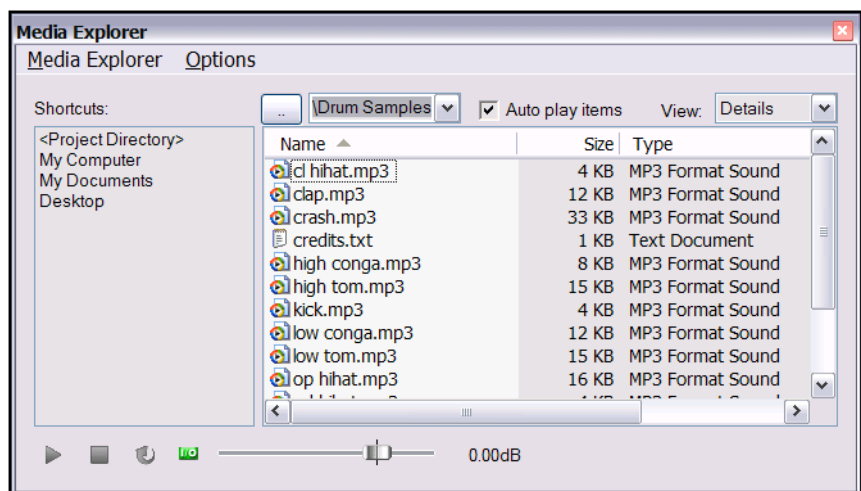
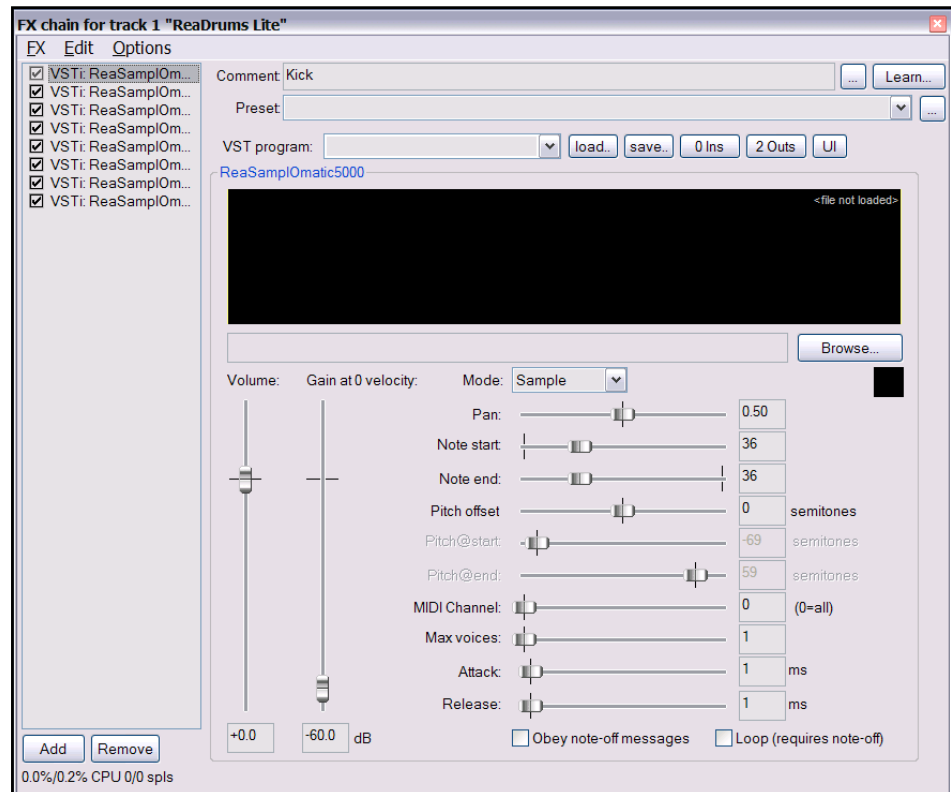
In the example that follows, we will using the **Virtual MIDI Keyboard**, but of course if you have a real MIDI device, you can use that instead.

Example

1. Create a new empty project file and save it as **ReaDrums Example.RPP**
2. Right click over the Track Pane Area and from the menu choose **ReaDrums**. Notice that a track will be inserted, already armed for recording and with eight instances of ReaSamplomatic inserted in its FX bin.
3. Notice that each instance of ReaSamplomatic is set up differently. From top to bottom, with their respective notes these are:

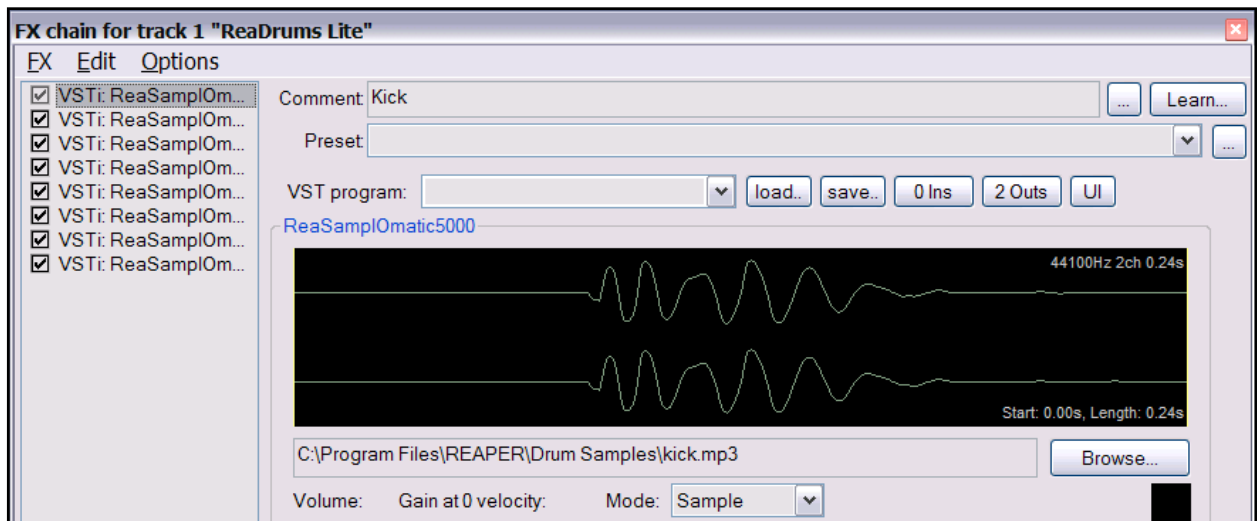
Kick - 36
Snare - 37
Perc 1 - 38
Perc 2 - 39
HH CL - 40
HH OP - 41
Cym 1 - 42
Cym 2 - 43

4. Now display the Media Explorer – **Ctrl Alt X** – and select a folder where your samples are stored.



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5. In the Track FX bin, select the first instance of ReaSamp (Kick). From the Media Explorer window, drag with your mouse the required sample file and drop it into the ReaSamp window, in the edit box just left of the Browse button. This is illustrated below.



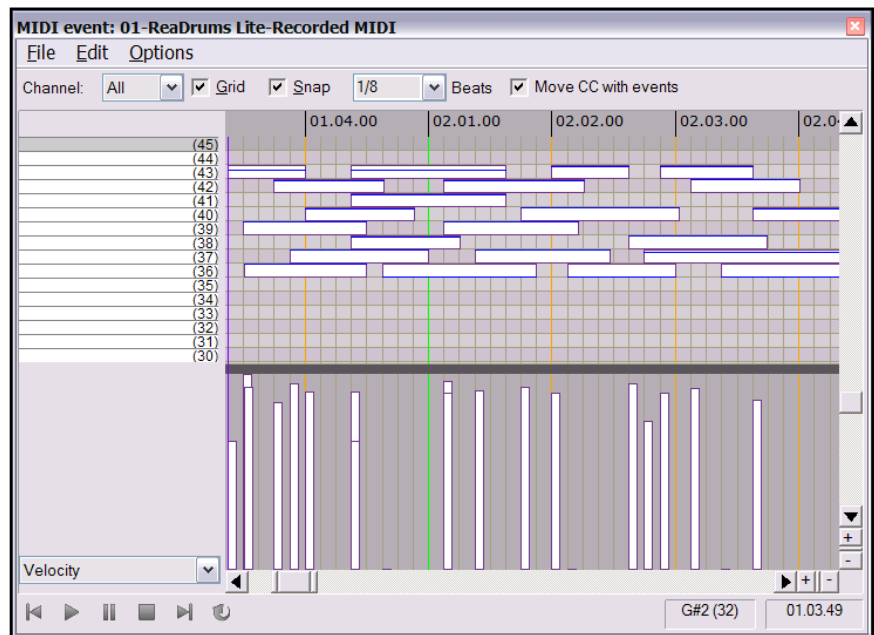
Now repeat this process in the other seven ReaSamp instances, one at a time, for each of the other seven instruments, each time inserting a different appropriate sample.

6. Right click over the REAPER Drum track's VU meter, select **MIDI Input, Virtual MIDI Keyboard, All Channels**.

7. Experiment with the keyboard so as to identify exactly the eight keys that drive each part of your virtual drum kit.

8. When you are ready, record a short piece.

9. Double click on the recorded passage to open the MIDI Editor. Choose the **Options, Mode: Named Notes** command. You can now change the length and/or position of any note, copy, duplicate, etc. When finished, close the MIDI Editor and save your file.

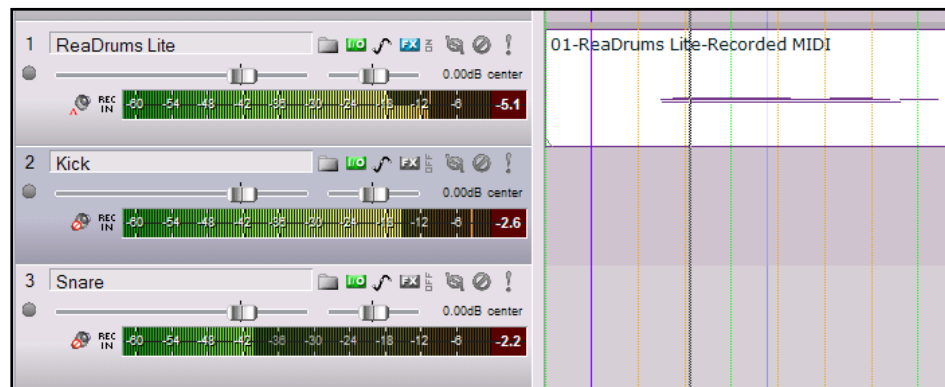
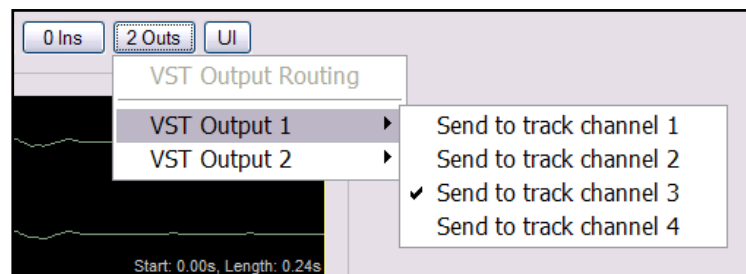
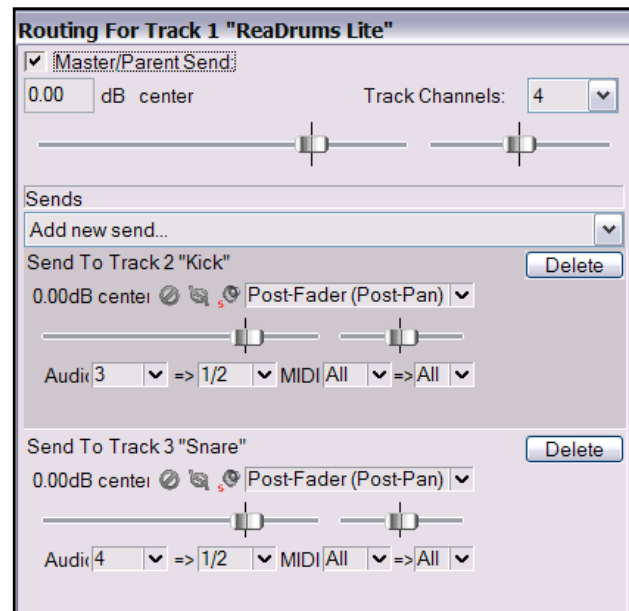


If you wish, you can also use REAPER's channel routing to send different parts to different tracks, where you can add FX, adjust panning, volume, etc. Let's suppose we wish to apply some FX to the kick and the snare individually.

1. Right click over the Volume fader for the ReaDrums track and set the number of channels to four. We'll start with just one or two.

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2. Press **Ctrl T** twice to add two more tracks.
3. Name the first of these tracks **Kick**, the second **Snare**.
4. In the **ReaDrums Lite** track set the number of Channels to 4, and create a send to the new **Kick Track** (using channel 3) and the **Snare Track** (using channel 4).
5. Open the **FX Window** for the **ReaDrums Lite** track.
6. Select the first ReaSamp instance, the **Kick**. Set both its VST Outs to Channel 3.
7. Select the second ReaSamp instance, the **Snare**, and set both its VST Outputs to Channel 4.
8. Now play the music. Notice that the Kick and the Snare have been rerouted to their respective tracks. Of course, you could now place any FX that you wish in the FX windows for those tracks.
9. Save the file.
10. If you add more channels to the original ReaDrums track, you can now repeat this effect for any other of your Drum parts.



17.10 Multi Output VSTi Plug-ins

REAPER also supports the use of VSTi plug-ins which allow multiple outputs. To use this facility, first insert the plug-in in a track's FX Chain, then right click over the plug-in name and from the context menu choose **Build multichannel routing for output of selected FX...** Provided the selected FX does support multichannel routing, REAPER will respond with a confirmation message similar to that shown (right).



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17.11 The IX Channel Mixer

Two great Jesusonic plug-ins are the **IX / Mixer 8xS** and the **IX / Mixer 8xM** which open up quite remarkable possibilities for how you can route your audio along different channels, then mix them back to produce some truly creative sounds and effects. The main difference between them is that one works with stereo paired channels, the other with mono channels. The example that follows is designed to show you how these mixers can be set up and used. After working through it, you should be capable of using it for your own projects.

Example

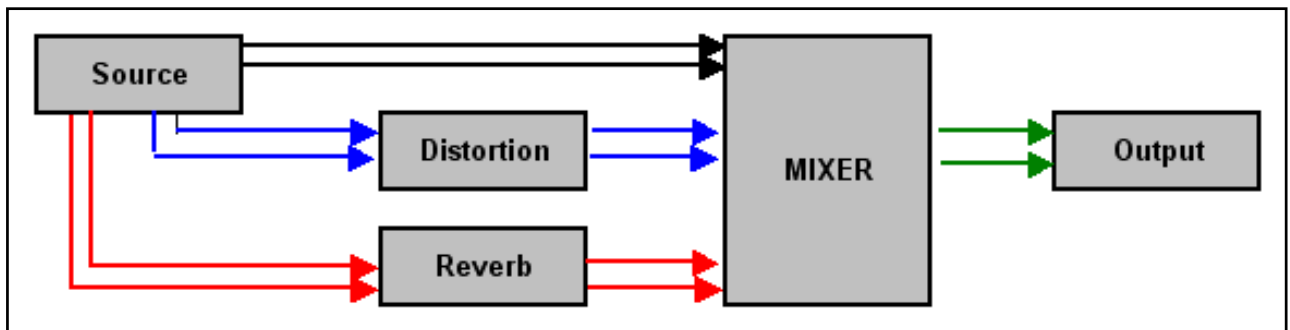
In this example, we will send output from one instrumental track separately to a Distortion FX and a Reverb FX, then mix the wet and dry signals back together, panning as required – all within one single track and without using any busses. To do this, we'll use the **IX Mixer 8xM**.

In the example, we will be using the following VST plug-ins. Both can be downloaded free of charge:

CamelCrusher – <http://www.camelaudio.com>

Glaceverb – <http://www.dasample.com>

The diagram below illustrates conceptually what we are going to achieve:



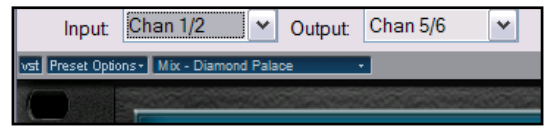
Notice that we will be running the signal *in parallel* to the two FX. By doing this, we ensure that each effect is processed separately before being mixed. This is different, of course from the normal FX chain, which processes effects sequentially.

1. Open the file **All Through the Night.RPP** and save it as **All Through the Night IX MIX.rpp**
2. For the purpose of this example, we are going to work on only the **Bouzouki** track. Solo this track.
3. Open the I/O window for the **Bouzouki** track. Set the number of channels to 6 then close this window.
4. Open the FX window for this track. If any FX are already there, remove them.
5. Insert the FX **VST CamelCrusher**. For this example select the preset **Clean Rainbow** and play the track. Notice the distortion.
6. Change the **2 Outs** settings on this plug-in so that CP1 is directed to Channel 3 and only Channel 3 (as shown), and CP 2 is directed to Channel 4 and only Channel 4.

VST Output Routing	
CP 1	Send to track channel 1
CP 2	Send to track channel 2
Send MIDI to chain	✓ Send to track channel 3
	Send to track channel 4
	Send to track channel 5
	Send to track channel 6

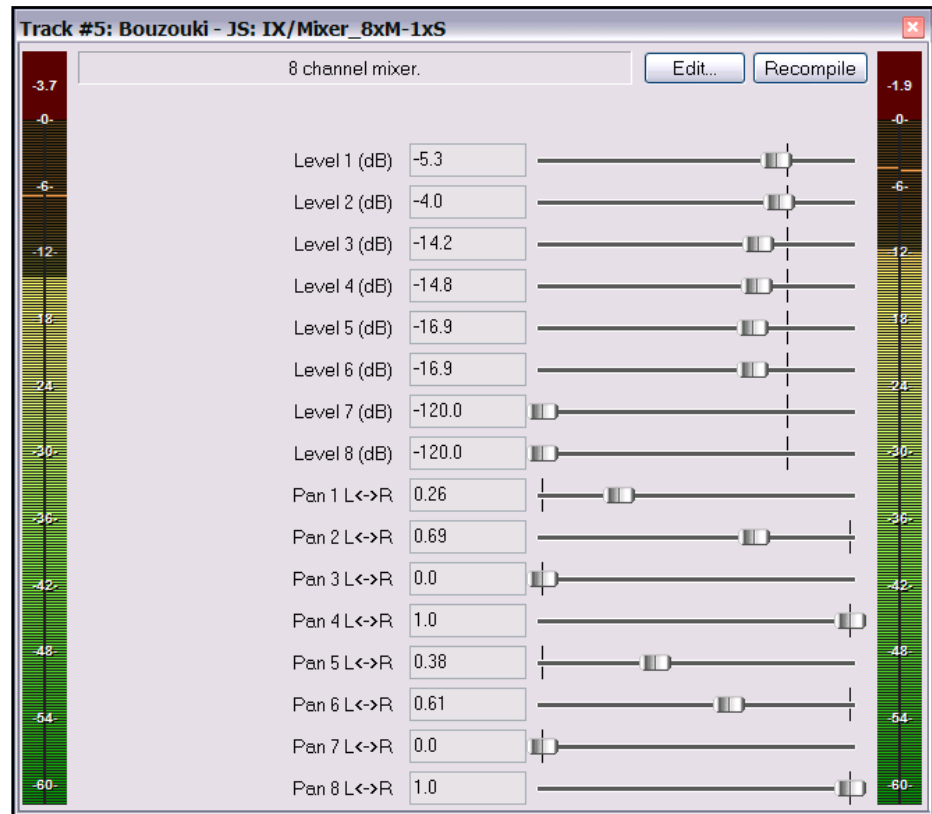
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- Now add **Glaceverb** to the FX Chain for the Bouzouki.
- Select a preset of your choice, then set the Output to Channels 5/6 as shown.
- Now insert the **JS: IX/Mixer_8xM-1xS** at the end of your FX chain for the Bouzouki track.
- Play the song and experiment with the volume levels and pan settings for your different channels.
- Save the file when finished.



Of course, this is only a simple example. You could in effect have up to four separate FX chains running in parallel within this track. And it's very easy then to move an FX from one chain to another, just by changing its output channels.

The **IX** series of JesuSonic plug-ins have been developed by Philip S. Considine. I am indebted to Philip for his help in developing this example.



For more information about any plug-in, including Terms of Usage, insert the plug-in into any track FX window, then click on the **Edit** button. Be careful not to make any changes though!

17.12 More Parallel FX Processing

The example you have just considered demonstrates Parallel FX processing at its simplest. By experimenting with this feature, you can really contour your sounds exactly as you need to.

This next example looks at using three paired channels for this purpose:

Channels 1 and 2: Dry – the original signal, unprocessed.

Channels 3 and 4: Distortion.

Channels 5 and 6: EQ then Reverb.

All three streams then get mixed back together using the Channel Mixer Plug-in.

Example

In this example, you would first set up the track as a six channel track, and then insert the following plug-ins into the track's FX window:

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VST Distortion plug-in of choice: Input from Channels 1 and 2, Output to Channels 3 and 4.

EQ plug-in of choice (e.g. ReaEQ) – Input from Channels 1 and 2, Output to Channels 5 and 6.

Reverb plug-in of choice (e.g. ReaVerb) – Input from Channels 5 and 6, Output to Channels 5 and 6.

Channel Mixer Plug In – Mix Channels 1, 2, 3, 4, 5 and 6 as required.

17.13 Other Channel Routing Plug-ins (Overview)

The list of Jesusonic and Cockos plug-ins for REAPER is an impressive one, and one that is still steadily growing. The following table provides an overview of some of the other channel routing plug-ins that are currently available. You should always check the web sites and the forums for the latest information. This section introduces you to some plug-ins that are specifically designed for use in a multi-channel routing environment.

The information shown below has been extracted from the text files supplied with these plug-ins by their author, Philip S. Considine. Obviously, the plug-ins listed below can only be used on tracks which have more than one defined pair of channels.

Plug-in	Description
IX Mixer_8xS-1xS	This channel mixing utility mixes up to four input pairs into a single stereo pair, output on channels 1+2. Each pair of inputs has a slider to control the amount of the input that will be mixed into the output.
IX Switcher	This is a channel switching utility. The Output Source parameter is used to select which one of up to four paired inputs channel is to be monitored. Useful for A/B comparisons.
IX Switcher 2	This is a variation of the Switcher switching utility. The Output Source parameter is used to select which one of up to four paired inputs channel is to be monitored, and the Level faders allow you to adjust the gain independently for each pair. Useful for A/B comparisons.
IX SwitchMix	This crossfade utility allows you to feed up to four input pairs to two busses then mix those busses to output channels 1+2. The destination for each of the four paired inputs can be set to Off, A, B, or A+B.
IX PhaseAdjustingRouter	Takes the signal from an input channel pair and modifies the phase according to the selected mode. The modified signal is then output on the selected output channels. Only the selected output channels will be modified so, for example, a signal received from inputs 1+2 and output on 3+4 will still be present in its original form at outputs 1+2. The Input parameter is used to select which paired channels are used for the input. The Phase Mode can be set to No Change, Invert Left Channel Only, Invert Right Channel Only or Invert Both Channels. The output parameter selects the output channels.

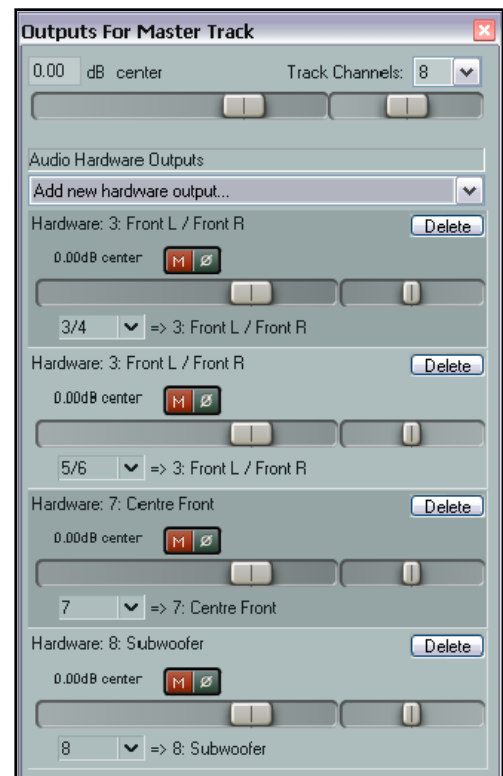
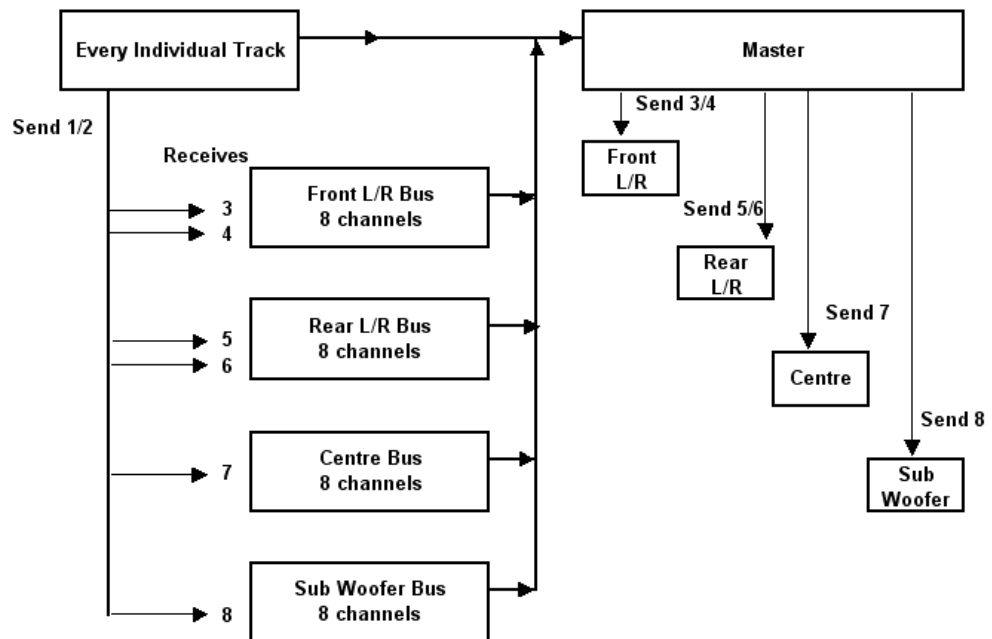
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17.14 Surround Mixing

REAPER's flexible channel routing opens any number of avenues for you. The diagram below illustrates one way that you could set up a project template ready for Surround Mixing, in this case using 5.1.

This diagram represents the following setup:

- Four special tracks have been set up to act as Surround Busses. Each of these tracks is defined as having 8 channels.
- Sends are established from every other track (or perhaps folder) to each of these busses. All receives to the Front L/R bus are through channels 3/4, all receives to the Rear L/R bus are through channels 5/6, and so on.
- All tracks and the four special busses have their output directed to the Master Track.
- Assuming that you have a soundcard with sufficient audio outputs, all six speakers are physically connected to one each of six of your audio outputs.
- The Master is set up as an eight channel Master, with outputs routed to the various speakers as shown right.
- Mixes for the various output can be controlled using the Routing windows of the four special bus tracks.
- Relative overall output levels to each and all of the speakers can be controlled from the Master Track's output window, shown right.
- FX and plug-ins within the Master Track can now be assigned to any or all of your various hardware outputs. This is one example of where being able to rename the FX instance can be helpful.
- You can still create a separate stereo mix if you wish, in this example using Channels 1 and 2 for this purpose.



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18 The Macro Advantage

18.1 Introduction

The ability to create your own keyboard macros in REAPER isn't just a party trick. It's one of the major features which makes REAPER stand out from the pack. This is for two main reasons:

- By using keyboard macros for those tasks, and sequences of tasks, that you use the most you can dramatically improve your workflow.
- There are many tasks that can be assigned through macros that are not available from the standard REAPER menus. By creating macros, you can actually increase the functionality of the software in those areas that are most important to you.

Before working through this section, you should have obtained at least a basic understanding of how you assign keyboard shortcuts via the **Options, Preferences, Keyboard/Control** window. There are several examples of this in the main body of this User Guide (see Index).

Throughout this section, I am indebted to **Bevoss** who first thought up and then created most of the sample macros used.

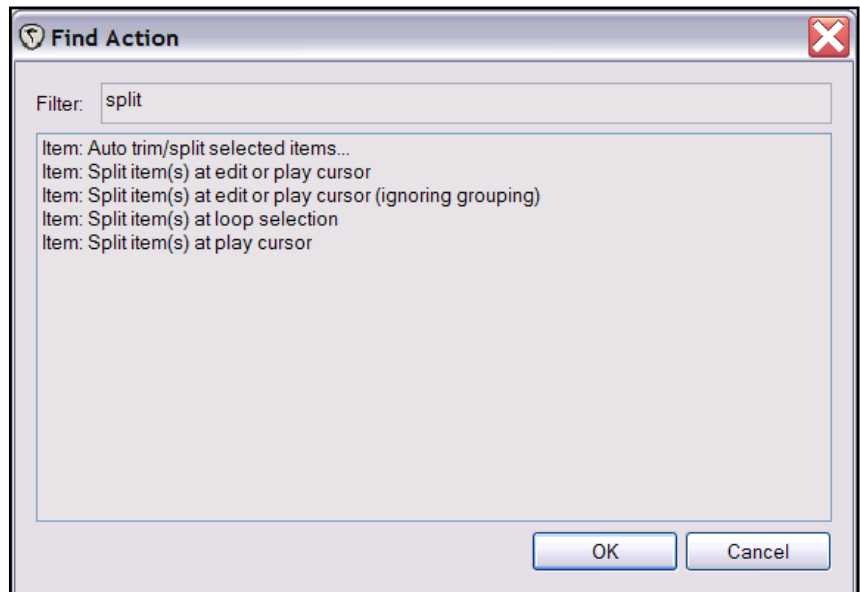
18.2 Mining for Macros

Later in this section, we'll take you through some sample applications for macros. These should help to get you started, and will probably leave you wanting more. One way to find out what else is available is to search through the Action List.

Example

Suppose that you wish to explore possible ways in which you might be able to use macros for splitting items.

1. Simply press **Ctrl P** then **K** (Options, Preferences, Keyboard/Control).
2. Click on **New** then **Search**.
3. Type **split** in the Filter box. A list of assignable actions involving splitting is displayed.
4. Notice that one action is to **Split items at edit or play cursor**. Wouldn't it be nice to be able to move the edit cursor to the current mouse position and then split there?
5. We can again use the Filter box to look for macro actions involving the mouse. If you do, you'll find that one of these is **Item: Select item under mouse cursor** and another is **View: Move edit cursor to mouse cursor**.
6. By this process, we can work out our steps, and create a macro as shown overleaf.

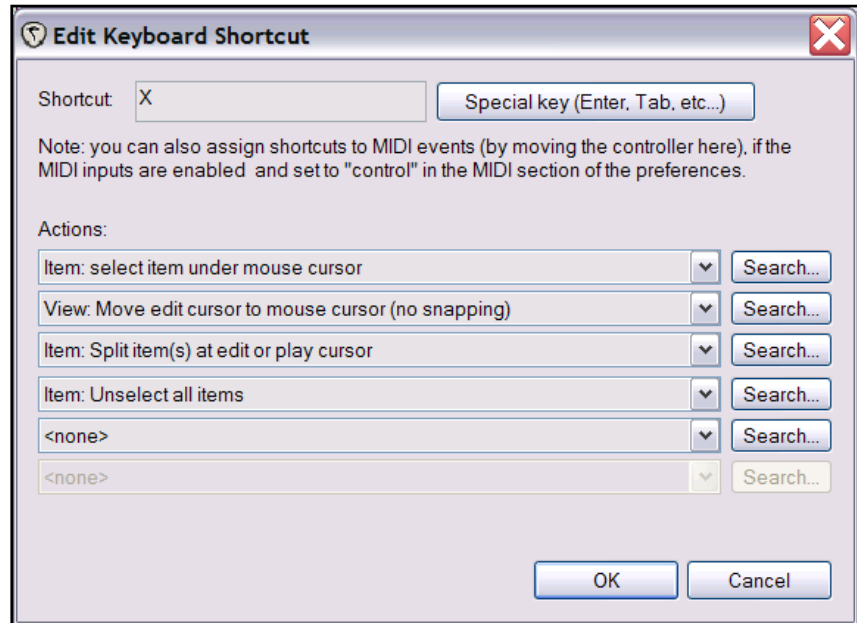


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In this example, the macro has been assigned the letter **X**.

If you create the macro shown here, you will find that you can now hover your mouse over any media item on any track, in any project and by pressing the X key on the keyboard split the item at that exact point.

Tip: Don't forget to click on the **Save** button within the Keyboard/Control window from time to time, to save your macros and keystroke definitions.



18.3 Macro Zoom Examples

Zoom Item to Screen

This macro chains together a series of actions so that you can point the mouse at the item you want to zoom in on, hit the keyboard shortcut, and it will enlarge it to fit the screen. The Reverse Zoom Macro reverses this.

Suggested keyboard shortcut: **Z**

Actions:

- Item: select item under mouse cursor
- Time selection: set time selection to selected items
- View: zoom time selection
- Time selection: remove time selection
- View: toggle tracks to maximum height
- Item: unselect all items

Reverse Zoom

Suggested keyboard shortcut: **Shift Z**

Actions:

- View: toggle tracks to minimum height
- View: toggle tracks to maximum height
- View: zoom out project

Zoom Selected Item

Suggested keyboard shortcut: **Alt Z**

Actions:

- Item: select item under mouse cursor
- View: zoom time selection
- View: toggle tracks to maximum height

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18.4 Track Solo and Play Macros

When mixing your projects you will frequently need to perform actions like soloing tracks, playing the soloed track, unsoloing, etc. This set of macros lets you perform these (and other) various tasks swiftly and easily. Notice especially how the first three of these macros pick up the track to be soloed (or unsoloed) from the current position of the mouse cursor. This enables you to select a track to be soloed and perhaps played without needing to move the mouse away from the area of the screen where you are working.

Solo Item

- Item: select item under mouse cursor
- Loop selection: set loop selection to selected items
- Track: unsolo all tracks
- Track: toggle solo for last touched track
- Loop selection: remove loop selection

Play Item Soloed

- Item: select item under mouse cursor
- Loop selection: set loop selection to selected items
- Track: unsolo all tracks
- Track: toggle solo for last touched track
- Loop selection: remove loop selection
- Transport: Play

Play Item Unsoloed

- Item: select item under mouse cursor
- Loop selection: set loop selection to selected items
- Track: unsolo all tracks
- Loop selection: remove loop selection
- Transport: Play

Solo Track

- Track: unsolo all tracks
- Track: toggle solo for last touched track

Move to Next Track and Solo it

- Track: unsolo all tracks
- Track: go to next track
- Track: solo/unsolo selected track

You can of course also create a similar macro to move to previous track and solo it. Just assign a different shortcut and substitute *Track: go to previous track* as the second action.

Move to Next Item , Solo and Play

This macro is especially clever for the way in which it not only solos and plays the specified track but also for the way in which it moves to the start of the next item on the soloed track and commences playback there.

- Item navigation: select and move to next item
- Track: unsolo all tracks
- Track: solo/unsolo selected track
- Transport: play

You can of course also create a similar macro to move to previous item and solo and play it. Just assign a different shortcut and substitute *Item navigation: select and move to previous item* as the first action.

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18.5 Macros for Inserting Markers

Elsewhere in this User Guide you were introduced to [an example of a macro for creating markers](#) at the start and end of an item. Here are a couple more useful macros that can be used to create markers:

Insert Markers at Start of Items on Track

Item Navigation: select and move to next item

Markers: insert marker at current position

Insert Marker at Mouse Position

View: move edit cursor to mouse cursor (no snapping)

Markers: insert marker at current position

18.6 Track Management Macros

This next series of macros can help you perform a number of commonly performed track management operations.

Duplicate Tracks without Items

Use this macro to create a new track with the same track settings (Volume and Pan levels, FX Window, Inputs and Outputs, etc) but without the media items.

Track: duplicate selected tracks

Item: select all items in selected tracks

Item: remove selected tracks

Freeze Selected Tracks

This automatically applies fx to items in a track, and bypasses the fx.

Item: select all items in selected tracks

Item: apply fx to items

Track: set all FX off-line for selected tracks

Track: toggle fx bypass for selected tracks

Unfreeze Selected Tracks

This unfreezes the track.

Item: select all items in selected tracks

Item: delete current take from items

Track: toggle fx bypass for selected tracks

Item: set all FX on-line for selected tracks

Apply FX Destructively as a New Take

This two part macro is used to apply new fx to a track and render it, without affecting the present fx. It moves the file to a new track, applies the fx, and places it back on the original track again. You can reverse the process using the Unfreeze Macro. You will obviously need to assign two separate keyboard shortcuts, one to each part.

Track: insert new track

Item edit: move items down one track

View -> show fx browser window

Now you select the fx, tweak it to taste, and continue...

Item: apply fx to items

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Item edit: move items up one track

Track: cut selected track

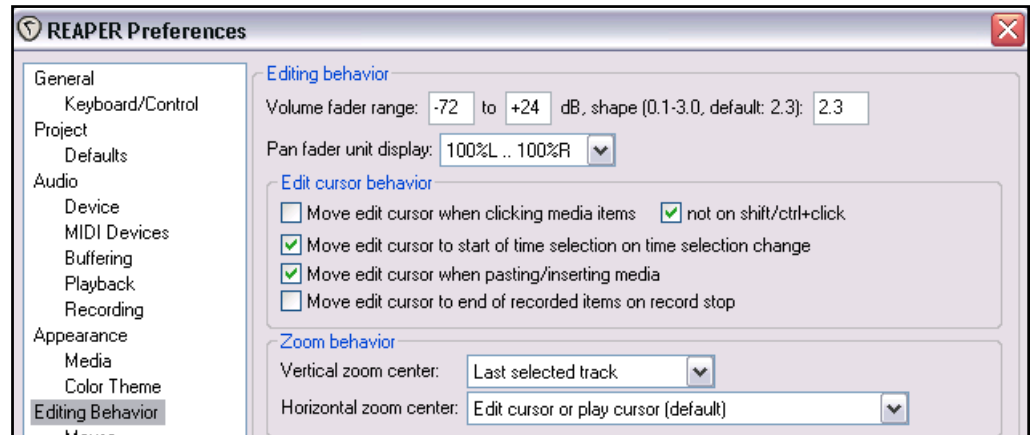
18.7 Media Item Management Macros

The examples used in this sub-section have been developed and supplied by **Tallisman**.

For these macros to work, you will need to ensure that the following options on the **Editing Behavior** page of your **Preferences** settings are turned on:

Move edit cursor to start of time selection on loop selection change.

Move edit cursor when pasting/inserting media.



Copy and Paste Selected Area of Item (1)

This macro will copy the selected area of any media item and paste the copy immediately to the right of it, *overwriting whatever was there before*. To execute the macro, first select the media item, then click and drag along the timeline to select the required area, then press the assigned macro shortcut key.

Item: Copy portions of items in time selection

Time Selection: Shift right by time selection length

Item: Select all items in selected tracks

Item: Split item(s) at time selection

Item: Remove selected area of selected items

Item: Paste items/tracks

Copy and Paste Selected Area of Item (2)

This macro will copy the selected area of any media item and paste the copy immediately to the right of it, *moving to the right whatever was there before*. To execute the macro, first select the media item, then click and drag along the timeline to select the required area, then press the assigned macro shortcut key.

Item: Copy portions of items in time selection

Time Selection: Shift right by time selection length

Item: Split item(s) at time selection

Options: Ripple editing, one track

Item: Paste items/tracks

Options: Ripple editing off

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18.8 Folder Management with Macros

Apply a Muted Overview to a Drum Folder:

This two part macro renders a mix of the folder, mutes it, and places it on the Folder track. You can then group the folder and child tracks, minimize the folder, and edit the folder track as you wish, which edits all the tracks. This is very useful for editing drum tracks, slicing up beats, or just hiding the child tracks and still seeing where you are. Because of the six action limit, this needs to be split across two macros.

Macro 1

- Track: render selected tracks to stem tracks (and mute/bypass originals)
- Item: select all items in selected tracks
- Item edit: move items down one track
- Track: go to next track
- Track: toggle fx bypass for selected tracks
- Track: mute/unmute selected tracks

Macro 2

- Item properties: toggle items mute
- Item navigation: select and move to item in previous track
- Track: cut selected tracks
- Item navigation: select and move to item in next track
- Item navigation: select and move to item in previous track

One way of overcoming the six action macro limit is to use **ReaperScript** or **AutoHotkey**. You will find an introduction to both of these topics later in this guide.

18.9 The Belkin Nostromo n52 Speed Pad

If you are planning to do a lot of work with macros, it's probably worth considering investing in a Belkin Nostromo n52 Speed Pad or some other similar device. The n52 complements your mouse and keyboard nicely. You can program any macros – or series of macros – into its various keys. Any of these macros can then be recalled and executed at the click of a button.

This device retails officially at around US \$40, but can usually be purchased for less from most retail outlets where it is available. Google for more information

18.10 The Next Level

If you want to take your macro writing capabilities up to a higher level, you can do so using **ReaperScript** and **AutoHotkey**. There are introductory sections on both these topics later in this User Guide.

18.11 REAPER Macro Assistance

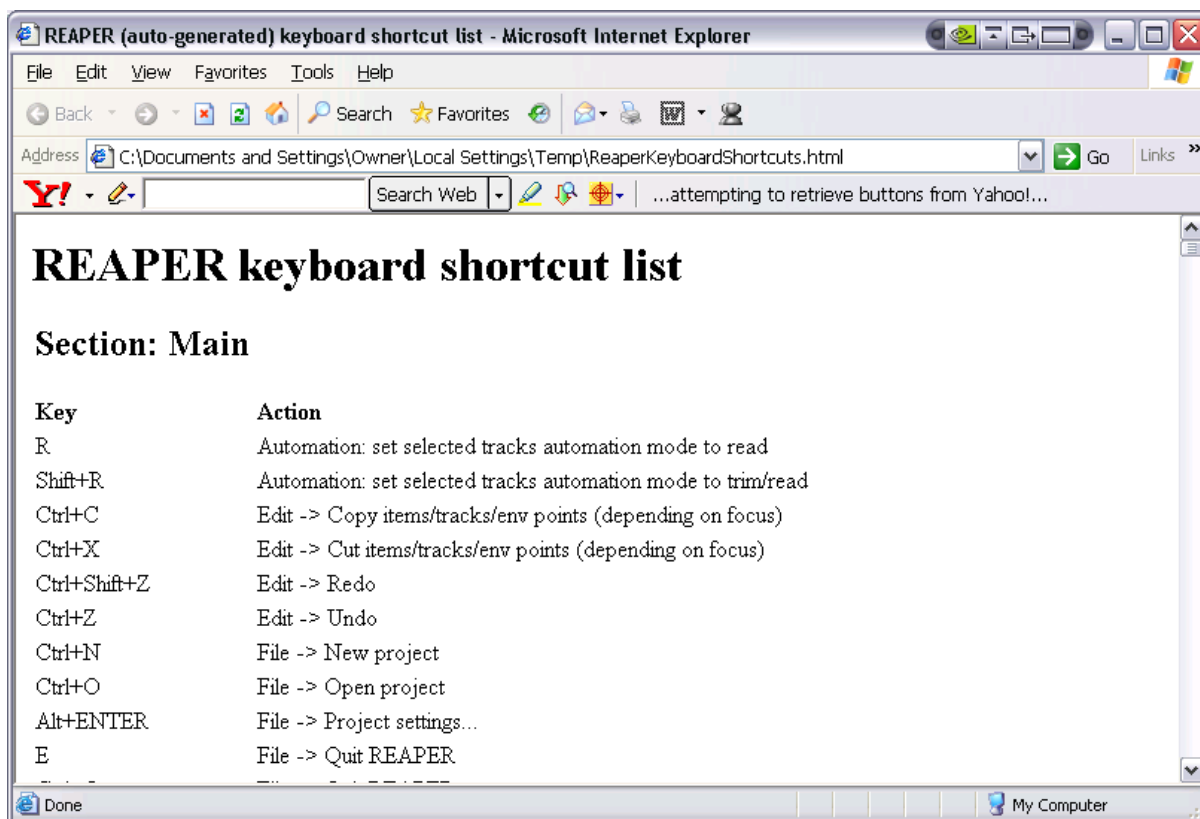
Now that you have been shown how to create REAPER macros and assign them to keyboard shortcuts, it's up to you now to decide how you wish to apply that knowledge. One challenge, however, can be finding out all the actions that can be included within macros – there are so many of them.

Within the **Options, Preferences, Keyboard / Control** window, you can click on **View shortcuts as printable / searchable web page** to view the entire list in your web browser, but this might not always be convenient.

Two more options are available directly from the REAPER Help menu.

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You can choose the **Help, Keyboard Shortcuts** command to display in your web browser a page listing all currently assigned keyboard shortcuts. This of course is searchable and may be printed.



You can also use the **Help, Show Action List** command to display a list of assignable actions, without having to go into the **Options, Preferences, Keyboard / Control** window.

This can be especially helpful when you are working out ideas for your macros.

This list can be filtered as you wish.

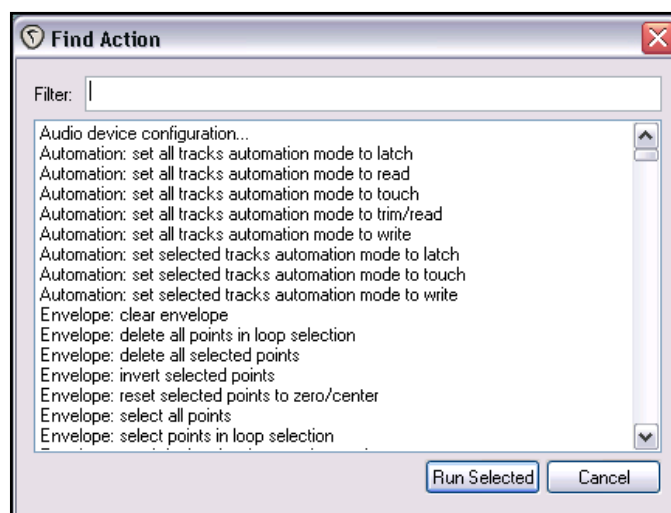
In addition, the **Run Selected** button can be used to test any action listed.

The keyboard shortcut **?** can be used to display the Action List.

Remember too that you can download a summary table of REAPER Default Keyboard Shortcuts:

US letter page format: <http://www.cockos.com/~glazfolk/ReaperKeyboardShortcuts.pdf>

International A4 page format: <http://www.cockos.com/~glazfolk/ReaperKeyboardShortcutsA4.pdf>



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19 Some Third Party REAPER Add Ins

This section introduces you to some handy third party utilities that can be used in conjunction with REAPER. None of them is a product of Cockos or is supported by the authors of REAPER. All of the items discussed in this section are available free of charge from the download sites given.

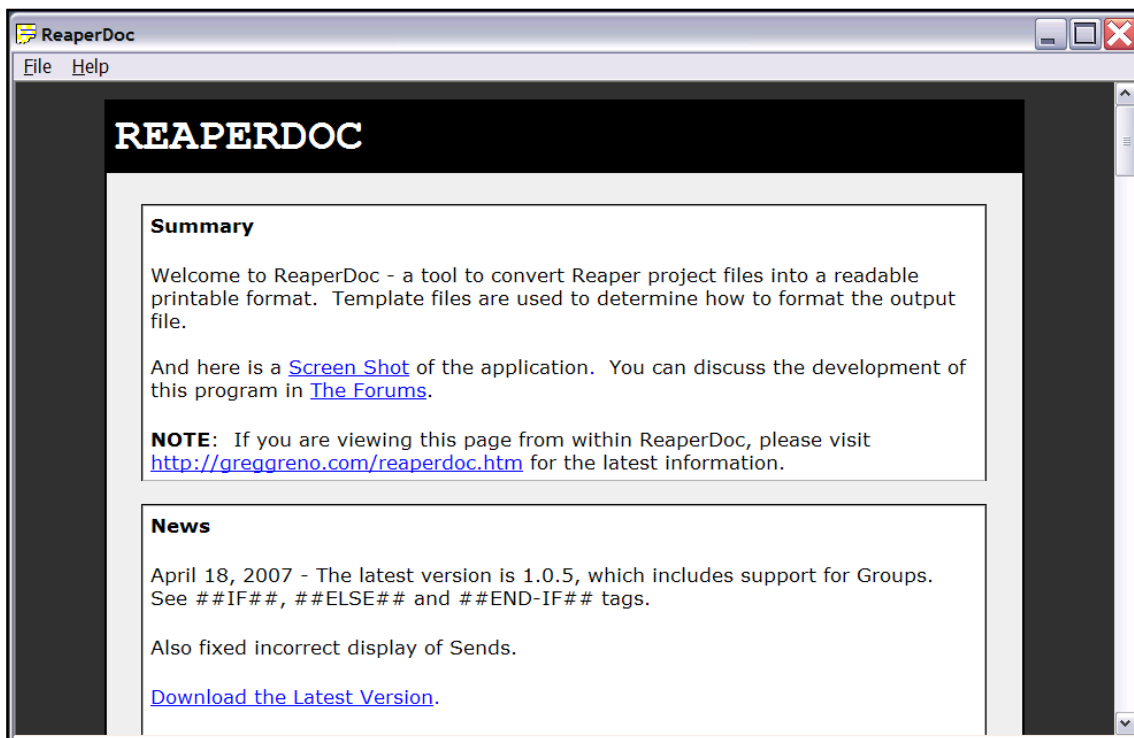
To learn more about these and other third party add-ins, be sure to check the REAPER Forums regularly.

19.1 ReaperDoc

ReaperDoc is a tool to create from any REAPER project files a readable file in HTML format. This is especially useful if you want to create a printout of your project's structure and contents. The original .RPP file is, of course, not altered or affected in any way by the use of ReaperDoc.

ReaperDoc uses template files to determine both the contents and the layout of the output file. You can use any of the template files that are supplied with ReaperDoc, or you can create your own. Information on how to create your own templates is supplied with the program.

ReaperDoc can be downloaded from <http://greggreno.com/reaperdoc.htm>



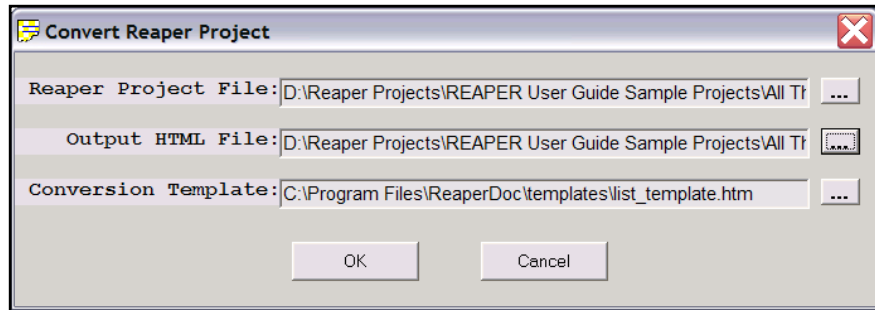
The procedure for using ReaperDoc is quite simple:

- From the menu, choose the **File** command, then **Convert**
- Specify the path and name of the REAPER project file.
- Specify a name and path for the output file.
- Select a template. A description of the available templates is supplied with the program. The templates are all in HTML format except for one template in .TXT format that produces a file that can be imported into Excel.

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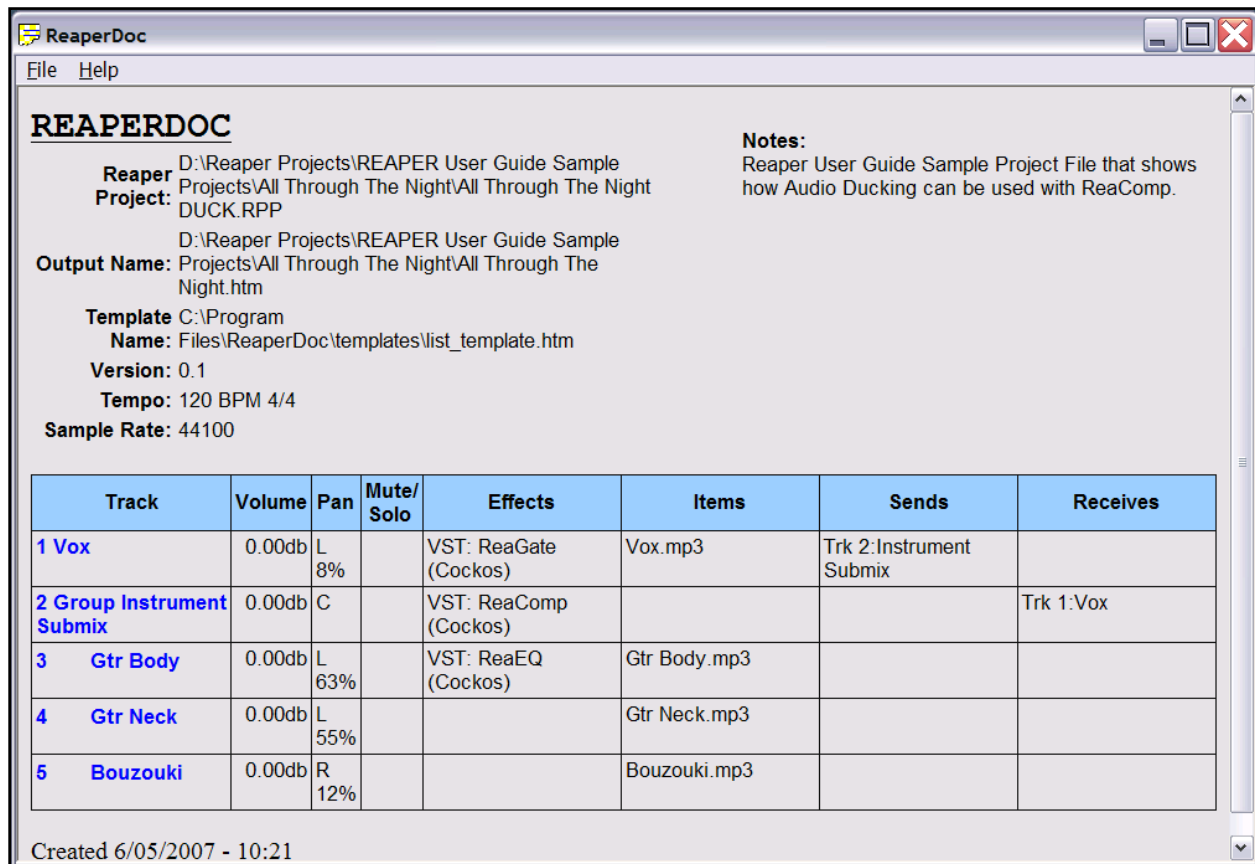
Example

1. Open the **ReaperDoc** program.
2. Choose the **File** command, then **Convert**.
3. Click on the first ... button and navigate to select your REAPER project file.
4. Click on the second ... button and navigate to the required folder for your output file. Type a name for your output file and click **Save**.
5. Click on the third ... button and select your required template file.
6. Click on **OK**.



An example of a ReaperDoc output file is shown below.

This example includes such information as Track Name and Number, Project Notes, Volume and Pan settings, Track Mute/Solo status, Track FX, Track Media Items, Sends and Receives.



REAPERDOC

Reaper Project: D:\Reaper Projects\REAPER User Guide Sample Projects\All Through The Night\DUCK.RPP

Output Name: D:\Reaper Projects\REAPER User Guide Sample Projects\All Through The Night\All Through The Night.htm

Template Name: C:\Program Files\ReaperDoc\templates\list_template.htm

Version: 0.1

Tempo: 120 BPM 4/4

Sample Rate: 44100

Notes: Reaper User Guide Sample Project File that shows how Audio Ducking can be used with ReaComp.

Track	Volume	Pan	Mute/Solo	Effects	Items	Sends	Receives
1 Vox	0.00db	L 8%		VST: ReaGate (Cockos)	Vox.mp3	Trk 2:Instrument Submix	
2 Group Instrument Submix	0.00db	C		VST: ReaComp (Cockos)			Trk 1:Vox
3 Gtr Body	0.00db	L 63%		VST: ReaEQ (Cockos)	Gtr Body.mp3		
4 Gtr Neck	0.00db	L 55%			Gtr Neck.mp3		
5 Bouzouki	0.00db	R 12%			Bouzouki.mp3		

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19.2 ReaperScript DIY

REAPER incorporates very powerful keyboard shortcut capabilities. Using **Options, Preferences, Keyboard Control** you can assign any command, or sequence of up to six commands, to any keystroke. [Examples of this](#) are covered elsewhere in this guide. But what if you want to chain together more than six commands? For example, you may wish to create a single keystroke to zoom in closely on the currently selected track at the current cursor position, and another to zoom out again.

This is where **ReaperScript DIY** can come to your rescue. It can be downloaded from http://www.inside-audio.nl/download_reaper_addons.html

You can then assign any sequence of keystrokes to any of the keys F1 through F12, Print Screen, Scroll Lock, Pause Break and the Right Windows Logo key, as well as the middle mouse button.

ReaperScript DIY comes with good documentation and some great examples. In this section we'll just take you through some of the basics. After downloading **ReaperScript DIY**, unzip the file to your desktop, so that both the PDF Instructions File and the ReapersScript.exe file are easily accessible. If you wish to use ReaperScript DIY, you should ensure that REAPER itself is closed, then start ReaperScript directly from the desktop. When you do so, REAPER will also be automatically started.

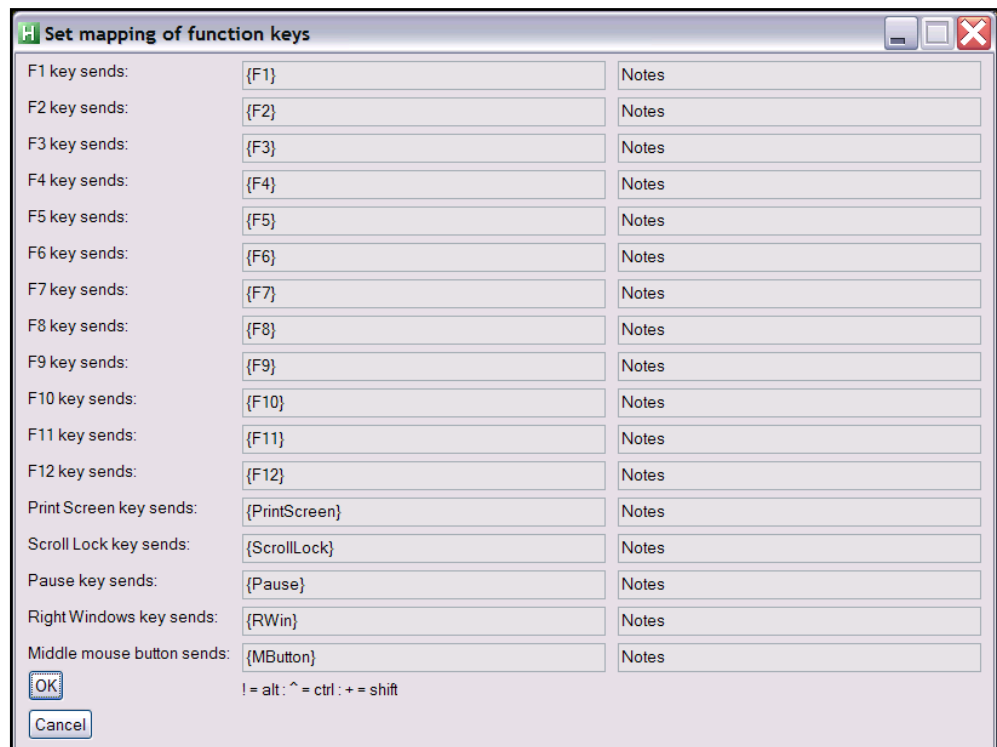
Some of these keys may already have assigned functions in REAPER that you wish to keep. Before redefining a key in ReaperScript, you might wish to first check for any existing assignments. To do this, go to **Options, Preferences, Keyboard Shortcuts** then click on **Find...**

The examples that follow assume that you are already familiar with assigning and using keyboard shortcuts in REAPER. It is also assumed that existing assignments include Page Up (Zoom In Vertically), Page Down (Zoom Out Vertically), the Plus key (Zoom In Horizontally) and the Minus key (Zoom Out Horizontally).

Example 1

In this example, we will assign **F10** to zoom in closely on the currently selected track, and **F12** to zoom out again.

1. Double-click on your **ReaperScript DIY** icon. This will launch REAPER and make ReaperScript available from within REAPER.
2. Open any project file that includes at least one recorded track.
3. Press **Shift F1** to open the ReaperScript window.



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4. Click in the edit box labelled **F10 key sends**.
5. Type (or copy and paste) the following:

{PgUp 6}{+ 6}

This might look strange at first. Its execution is the equivalent of pressing Pg Up six times, then the+ key six times. Alternatively, you could have entered **{PgUp}{PgUp}{PgUp}{Pg Up}{PgUp}{Pg p}++++++**. Notice that special keys like **Pg Up** need always to be typed within curly braces. A list of most of these is included near the end of this section.

6. Now select the Edit Box for **F12 Sends** and type (or copy and paste) the following.

{PgDn 6}{- 6}

7. Click on OK.
8. In the Track Control Pane area, select any track. Press **F10** twice and notice the zoom in. Press **F12** twice to zoom back out again.

Example 2

In this example, we will use the **Pause Break** key to go to the end of the song and insert a marker called End Of Song.

1. Press **Shift F1** to open the **ReaperScript DIY** window.
2. In the edit box labelled **Pause key sends** type:
{end}+mEnd of Song{enter}
3. Notice the difference between **{end}** which is the end key, and **End** which is the word End. Notice also the **+m** tells ReaperScript that you want the **Shift M** keyboard shortcut.
4. Click on **OK**.
5. Press the **Pause** key – a marker will now be inserted and named at the end of this song.

Summary of Special Key Names in ReaperScript DIY

Don't forget in each case the special key name must be enclosed in curly braces – for example **Tab** should be written as **{Tab}**. The use of upper case for the first letter is optional.

Tab	Insert	Up
Enter	Home	Down
Esc	End	Left
Backspace	PgUp	Right
Delete	PgDn	

ReaperScript DIY and AutoHotkey

ReapersScript DIY has been developed using the AutoHotkey program. ReaperScript DIY makes it fairly easy for you to create AutoHotkey macros. If you want to take this up to the next level, you can use AutoHotKey to create even more powerful and flexible macros for yourself.

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19.3 AutoHotkey

This section is one of the more advanced parts of this User Guide. Not everybody will want, or need, to read this section. A good understanding of REAPER macros is an essential prerequisite to working through this section.

19.3.1 The What and Why of Macros

REAPER, like other audio and sequencer software, has been designed to meet the needs of a whole variety of users.

Whether you are a DJ working with dance music, a singer songwriter working out some simple riffs, a programmer of electronic synth sounds, or anything else, you'll find that there are times when your needs aren't necessarily the same as those of most or many other users.

That's when you hit the "How do I get REAPER to do this?" area. Then, when you've figured out the answer, you likely as not move into the "Surely there must be a quicker and easier way than *that?*" territory.

Let's consider a couple of examples:

Example 1

You spend your life recording, mix and mastering music for your clients. Some have to be rendered to 16 bit 44.1 kHz WAV files to be burnt to audio CD. Others require MP3 format, Constant Bit Rate 128, joint stereo format, for distribution over the web. Sometimes, you need two versions, one of each.

It's a chore every time you open that **File, Render...** dialog box to have to keep changing the settings backwards and forwards. Moreover, with so many parameters, you can easily miss one, and make a mistake.

The solution: Create your own macros to save your own presets, as many different ones as you like. Any of your **File, Render** presets can then be recalled with just a couple of keystrokes – or, as you'll see towards the end of this section, with just one click of the mouse.

Example 2

Your work often requires you to split a recorded track into several media items. Frequently you need to raise or lower the volume on individual items. Of course you can use envelopes, but you find that time consuming, especially having to add points every time you split a new item. Similarly, you can use the Volume fader within the **Item Properties** dialog box for this purpose, but again, that's quite a chore.

The solution: Create your own macros so that by pressing just two keys you can raise or lower the volume on any selected media item as required

These and many other examples will be worked through in this section. Please remember that *they are only examples*. The purpose of this section is to teach you by example how you can apply these techniques to your own situation. That's where **AutoHotkey** comes in. It helps you to shape REAPER to make the program work the way *you* want it to work.

AutoHotkey (or AHK) is a wonderful free utility that can be used to create your own macros and scripts for use with REAPER or any other program. You can learn more about AutoHotkey and download the program, free of charge, from <http://www.autohotkey.com>

In this section, we will work through just a few examples to introduce you to how AutoHotkey works. You will find that it does take a little while to get AHK set up to work with REAPER – but this preliminary work only has to be done once. After that, things get relatively easier!

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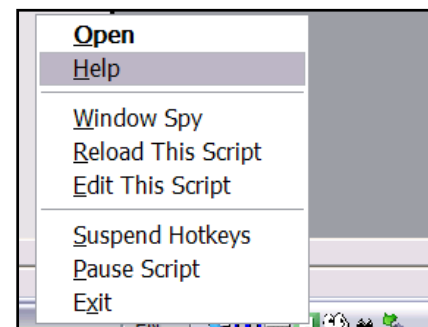
19.3.2 The AHK Components

AutoHotkey takes a little time to get used to. Let's start by looking at its main components:

Component	Purpose
AutoHotkey.exe	This file activates the AutoHotkey program. By default it is executed automatically on boot up.
AutoHotkey.ini	This file is loaded whenever the program file AutoHotkey.exe is executed. It contains macros that you create and which are always available to you, from the Windows desktop, and regardless of which applications are running.
<i>Myfiles.ahk</i>	<p>These are files that you create yourself and which contain your macros for specific programs. Although Notepad is adequate for the task, the use of a freeware program such as EditPad Lite is generally preferred. Its features include a recent files list, the ability to work with multiple files open, very powerful search options, the optional display of line numbers, and the ability to select and indent blocks of text.</p> <p>For example, you will want to create a Reaper.ahk file for your REAPER macros. In theory, you can get by without these files, placing all your macros in the one AutoHotkey.ini file.</p> <p>This is not recommended, however, as it can lead to ambiguity and confusion about which macros are associated with which program.</p>
AutoHotkey.chm	This is a CHM Help file for AutoHotkey.
SmartGUI.exe	<p>This program file is for more advanced users. It helps you to create your own GUI interfaces (for example, custom dialog boxes) for use within any application.</p> <p>There is a simple example of how to use SmartGUI towards the end of this section.</p>
AutoScriptWriter.exe	This utility can be used to capture and remember your keystrokes and mouse clicks. These can then be copied and pasted into your AHK macros.
AU3_Spy.exe	This displays information such as the current XY mouse co-ordinates, and can be useful when writing more advanced macros. This is beyond the scope of these introductory notes.

Notice too that after you install AutoHotkey, you will see a little green icon in your system tray whenever you boot up your computer. This icon indicates that the AutoHotkey.ini file has been loaded.

If you click over this icon, there is a context menu that you can use, for example, to Edit the script (for editing), and to reload the file after editing.



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19.3.3 AHK Modifier Keys

At risk of jumping the gun a little, at some stage we need to say something about how AHK defines and uses modifier keys. A modifier key is one that works in conjunction with another key to execute a macro. For example, if you use the keys **Ctrl D** to execute a macro, then **Ctrl** is the modifier key. AHK uses special symbols to represent modifier keys. You define a modifier key or keys for your macro by using these special symbols in conjunction with your normal key, followed by two colons. Some examples follow.

Modifier Key	Meaning and Example
+	This represents the Shift key. So, for example, to define Shift D as the keystrokes to execute a particular AHK macro, you would represent this on a header line as: +d::
!	This represents the Alt key. So, for example, to define Alt D as the keystrokes to execute a particular AHK macro, you would represent this on a header line as: !d:: If you wanted to use the combination Alt Shift D , you would represent this as: !+d::
^	This represents the Control key. So, for example, to define Ctrl D as the keystrokes to execute a particular AHK macro, you would represent this on a header line as: ^d:: If you wanted to use the combination Alt Ctrl D , you would represent this as: !^d::
#	This represents the Windows key. So, for example, to define Win D as the keystrokes to execute a particular AHK macro, you would represent this on a header line as: #d:: If you wanted to use the combination Win Shift D , you would represent this as: #+d::
Notes: The examples listed here are only the basic booster keys. In addition, AutoHotkey offers you a number of other possibilities. For example, you can: <ul style="list-style-type: none">• Assign separate shortcuts to Left and Right modifier keys. For example LeftCtrl C could execute one macro, RightCtrl C execute a different one.• The ampersand symbol (&) can be used when you want to include two or more keyboard characters in a macro execute combination. For example, ^z&x would represent Ctrl Z X, all pressed together.• For further information about these and other related topics, consult the Hot Keys section of the AutoHotkey Help files.	

This might seem a little confusing at first, but it should become clear when we have worked through a couple of examples.

Tip: *You will find it easier to work with AutoHotkey if you create your own Desktop Shortcuts for each of the following:*

- **AutoHotkey.chm**
- **AutoScriptWriter.exe**

*To do this, use the right mouse button to drag each of these files from Windows Explorer to your desktop, release the mouse and choose **Create shortcuts here** from the popup menu.*

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19.3.4 AHK and REAPER

AHK always works with the host program to enhance its capabilities, not apart from it. One very powerful way to use AHK with REAPER is to execute your REAPER macros, perhaps chained together, perhaps in conjunction with other keystrokes that cannot be included in a normal REAPER macro.

In order to make this happen, we need to set up our Reaper.ahk file and then modify the supplied AutoHotkey.ini file. This might seem a little long-winded a process – but remember that you only have to do this once.



19.3.5 Creating the Reaper.ahk file.

The Reaper.ahk file is the file that will contain your AHK REAPER macros. As you will shortly see, you can ensure that this file is automatically loaded whenever REAPER is started.

To create this file:

1. Open your text editor. You can use Notepad if you wish, but a more fully featured program such as **EditPad Lite** is recommended.
2. Either type the following, or copy and paste the text from this PDF file:

```
;
; AutoHotkey Version: 1.x
; Language:      English
; Platform:      WinXP
; REAPER Macros

#SingleInstance Ignore
#NoEnv ; Recommended for performance and compatibility with future
AutoHotkey releases.
SendMode Input ; Recommended for new scripts due to its superior speed and
reliability.
```

3. Use the **File, Save** command to save this as **Reaper.ahk** in your AutoHotkey Scripts folder. If you accepted the default settings when installing AHK, this should be:
C:\Program Files\AutoHotkey\Scripts
4. Exit Notepad. Later, of course, we will be returning to this file to insert some macros into it.

Note the following:

- All lines beginning with a semi-colon (;) are comment lines, for information only. Thus the first five lines are not necessary, but are recommended for good housekeeping.
- The **#SingleInstance Ignore** command ensures that if you close REAPER without closing this file, then reopen REAPER, a second instance of Reaper.ahk will not be opened.
- In the last two lines, the semi-colon after the command statements separate the commands from further comments.

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19.3.6 Modifying the AutoHotkey.ini file

The next step is to modify the AutoHotkey.ini file to ensure that we can automatically have Reaper.ahk opened whenever the REAPER program is started.

Quite possibly, your AutoHotkey.ini file might be installed with some sample macros already in it. If so, they can be deleted. The AutoHotkey.ini file can be found in your **C:\Program Files\AutoHotkey** folder. However, assuming that the green AHK icon is displayed in your system tray, you can right click over that icon and choose **Edit this script** to open this file in your text editor.

You can then copy and paste (or type carefully) the following, after the introductory comment lines.

```
; Win R - Start Reaper
#r::
Run C:\Program Files\AutoHotkey\Scripts\Reaper.ahk
Run C:\Program Files\Reaper\REAPER.exe
return
```

Explanation

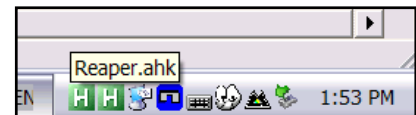
AHK Code	Comment
; Win R - Start REAPER	This is a comment line, which records the shortcut keys assigned to this macro and what the macro does.
#r::	This assigns the keyboard shortcut Win R to this macro.
Run C:\Program Files\AutoHotkey\Scripts\Reaper.ahk Run C:\Program Files\Reaper\REAPER.exe	These command lines cause first the Reaper.ahk macro file and then the REAPER program itself to be activated. Of course, if either of your file locations is different from that shown, you will need to use those instead of these.
return	All AHK macros end with a return statement, to mark the end of the macro.

If you wish, you can delete any sample macros that might already be in this file. Then save the file and close it.

You must now reload this file, to activate your changes. To do this, right-click over the AHK icon in your system tray, and choose **Reload this script** from the context menu.

To test that this has worked, simply press **Win R**.

This should cause REAPER to be opened – and you will see a second AHK icon (most likely next to the first) in your system tray. Hover your mouse over this icon, and you will see that this icon represents your **Reaper.ahk** file.



OK, that's it! Now you're ready to start using AHK to make some macros to use with REAPER.

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19.3.7 Some Sample AHK Macros for REAPER

We are now ready to explore a few examples of how we can use AHK in conjunction with REAPER to create some macros. Do not be concerned about whether or not these actual examples will themselves be useful to you. Some people may find them useful, others less so. The main purpose of these examples is to teach you how to use AHK to first record and then recreate your REAPER actions, commands, keystrokes and mouse clicks.

19.3.8 Recording and Replaying Keystrokes and Mouse Clicks

This first simple example will show you how to record keystrokes and mouse clicks, then edit the resulting material to create a macro. The sample task that we will be using to demonstrate this will be to open your Sound Card's Control Panel, perhaps to check or change buffer size, or some other setting.

This example assumes that you are using ASIO drivers.

1. Press **Win R** to start REAPER and to load your Reaper.ahk file.
2. Double click on your desktop **AutoScriptWriter** icon to launch this program. You will see a window opened similar to that shown (right).
3. Click on the red **Record** button. Every action you take will now be recorded until you click Stop.
4. Click on the REAPER title bar to make REAPER your active application window.
5. Press **Ctrl P** to open the Options, Preferences window.
6. Click the mouse on the **Device** heading within the Preferences window to access this page.
7. Click your mouse on the **Audio Configuration** button within that page.
8. Click on **OK** to close the Preferences window. Notice that the Control Panel for your software is now displayed. You could now make any changes that you wish, but don't do this just yet.
9. Click on the **Stop** button (shown right) to stop AutoScriptWriter. Most likely, this will be near the top left corner of your screen. Close your sound card's Control Panel.
10. Your AutoScriptWriter window will now display a series of lines describing what you have just done. These will form the basis of your macro.
11. Look for a block of text similar to that shown below, although the mouse co-ordinates will probably not be identical:



```
Send, {CTRLDOWN}p{CTRLUP}
WinWait, REAPER Preferences,
IfWinNotActive, REAPER Preferences, , WinActivate, REAPER Preferences,
WinWaitActive, REAPER Preferences,
MouseClick, left, 41, 144
Sleep, 100
MouseClick, left, 309, 369
```


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```
Sleep, 100
MouseClicked, left, 579, 536
```

12. The commands before and after this block are basically where you were moving between the different programs. This code has no place in your macro.
13. Select the block of text shown above, then press **Ctrl C** to copy it.
14. Right click over the system tray icon for your Reaper.ahk file. Choose **Edit this script** from the menu.
15. Position your cursor at the end of this file, and press **Enter** then **Enter** again to create some white space (for convenience).
16. Press **Ctrl V** to paste in your code. The file will now look like this:

```
;
; AutoHotkey Version: 1.x
; Language:          English
; Platform:          WinXP
; REAPER Macros
;
#SingleInstance Ignore
#NoEnv ; Recommended for performance and compatibility with future AutoHotkey
releases.
SendMode Input ; Recommended for new scripts due to its superior speed and
reliability.

Send, {CTRLDOWN}p{CTRLUP}
WinWait, REAPER Preferences,
IfWinNotActive, REAPER Preferences, , WinActivate, REAPER Preferences,
WinWaitActive, REAPER Preferences,
MouseClicked, left, 41, 144
Sleep, 100
MouseClicked, left, 309, 369
Sleep, 100
MouseClicked, left, 579, 536
```

17. Note that the three MouseClick statements have recorded the co-ordinates where you clicked three times inside the Preferences window. The first is where you clicked on **Device**, the second **Audio Configuration**, the third **OK**.
18. We now need to define a keyboard shortcut at the beginning of this macro, and add a return statement at the end. Edit this file to insert the extra lines shown in bold below:

```
;
#SingleInstance Ignore
#NoEnv ; Recommended for performance and compatibility with future AutoHotkey
releases.
SendMode Input ; Recommended for new scripts due to its superior speed and
reliability.

;Win Ctrl C - Open Sound Card Control Panel
#^c::
Send, {CTRLDOWN}p{CTRLUP}
WinWait, REAPER Preferences,
IfWinNotActive, REAPER Preferences, , WinActivate, REAPER Preferences,
WinWaitActive, REAPER Preferences,
MouseClicked, left, 41, 144
Sleep, 100
MouseClicked, left, 309, 369
```

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```
Sleep, 100  
MouseClicked, left, 579, 536  
return
```

19. You can delete the lines that says **Sleep, 100** if you like. These line are unnecessary. Each of these just inserts a delay of 100 ms.
20. Save this file and close it.
21. Right click over the system tray icon for this file and choose **Reload this script**.
22. Return to REAPER. Press **Win Ctrl C**.
23. Your Sound Card's Control Panel will now be opened.

Important Note: AHK and mouse co-ordinates. When you use AutoScriptWriter to record mouse clicks, it records the co-ordinates relative to the actual window that you click in – in this example, the Preferences window, not to the screen. This means that these co-ordinates will hold good regardless of the position of the window on the screen.

If in a later update of REAPER, that dialog box or window is redesigned, you may need to change your mouse click co-ordinates accordingly. There is no need, however, to record the whole macro again. You can use **AU3_Spy.exe** to find out the new mouse co-ordinates, then edit the text manually.

19.3.9 Incorporating REAPER Macros into AHK Macros

Our next example of an AHK macro will be one that allows you to use the keyboard to adjust the volume of a selected area of a track, without having to go through multiple keystrokes or give multiple commands. What this macro will achieve is to:

- Select the item under the mouse cursor.
- Split this at the current time selection.
- Display the Item Properties dialog box.
- Automatically select within the dialog box the Volume fader.

This enable you to then use the **Up** or **Down** arrows on your keyboard to make your adjustments, pressing **Enter** when finished.

This example combines the use of existing REAPER keyboard shortcuts with recording keystrokes.

Step 1: Assign your REAPER keystrokes

This example assumes that under **Options, Preferences, Keyboard/Control** you have the following assignments. Of course, you can use other keyboard assignments, but if you do so you will need to modify the macro accordingly.

Keyboard Shortcut	Assignment
Shift \	Item: Select Item Under Mouse Cursor Item: Split Item(s) at Time Selection
F2	Item Properties
U	Item: Unselect All Items
Esc	Time Selection: Remove Time Selection

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Step 2: Create the AHK Macro

We could of course record our macro, then copy and paste, as before, but this time we'll try something different – typing the macro for ourselves.

Let's first recall a couple of things we learnt from the code in the previous macro:

1. The **Send** command, followed by a comma is used to send a keystroke.
2. Case is significant when sending keystrokes. For example, lower case U is **u**, upper case U is **+u**.
3. One command per line!

OK, let's do it!

1. Right click on the **Reaper.ahk** icon in the system tray and choose **Edit This Script**.
2. Insert a blank line at the end of this file, then type (or copy and paste) the following:

```
;Win [ - change volume on an item
#[::
Send, +\
Sleep, 100
Send, {F2}
WinWait, Media Item Properties,
IfWinNotActive, Media Item Properties, , WinActivate, Media Item
Properties,
WinWaitActive, Media Item Properties,
Send, {TAB 19}
WinWaitClose, Media Item Properties
Send, u
Send, {Esc}
return
```

3. Save the file and close Notepad.
4. Right click over the **Reaper.ahk** system tray icon and choose **Reload this script**.

Now restore your REAPER window, with any file open.

If you now select any area along the timeline, hover your mouse over any media item and press **Win [**, then that media item will be split at the time selection, the Item Properties will be displayed and the macro will tab automatically to the volume control fader.

The macro will now pause - **WinWaitClose, Media Item Properties** – for you to use the up or down arrows on your keyboard to adjust the volume and press **Enter**. After that, the macro continues, the item is deselected and the loop deselected.

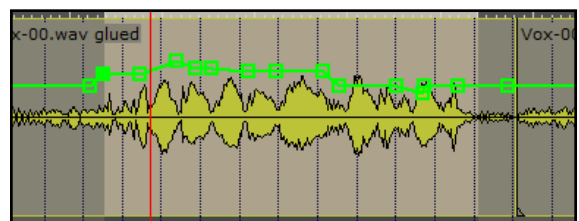
Note: *There are more sophisticated and satisfactory ways of handling this delay than using the **Sleep** command. However, for the purpose of this example, we are placing the emphasis on simplicity.*

A good use for this macro is to select part of a track that already has a Volume envelope on it, then raise or lower the volume for the entire selected portion of the envelope (see right)

Let's now take this a step further. We can use the **WinSetTitle** command to change the title of the Item Properties window to give us a message.

We can also improve this macro by using **WinWait**.

This example continues on the next page:

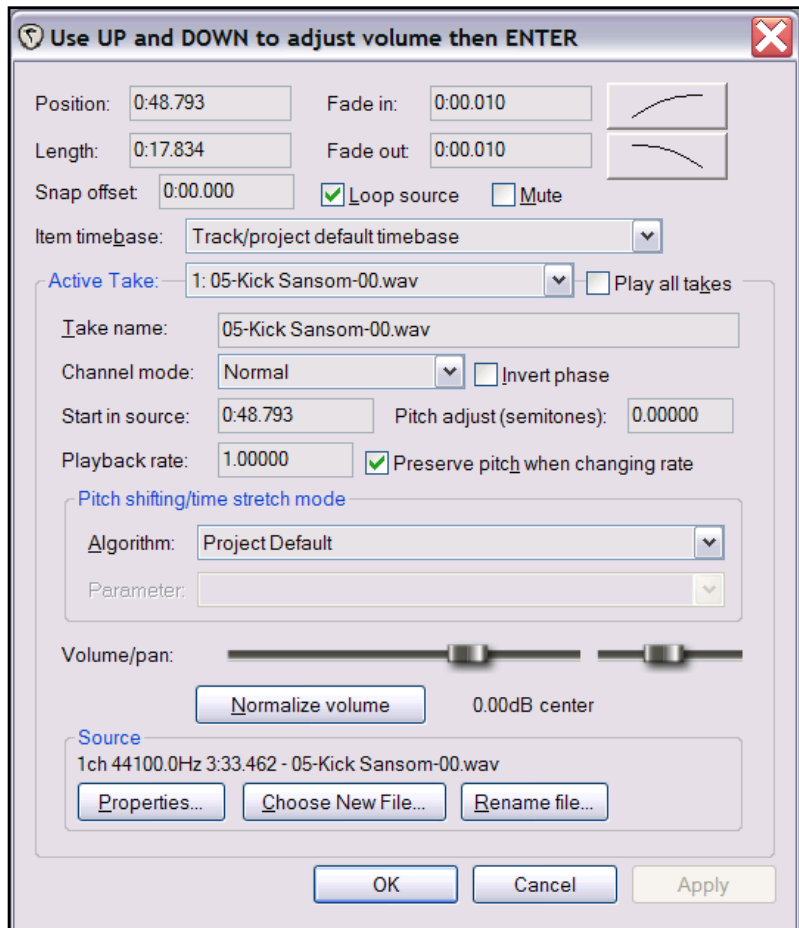


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The changes to our code are shown in bold face:

```
;Win [ - change volume on an item
#[::
SetTitleMatchMode, 2
WinWait, REAPER,
IfWinNotActive, REAPER, , WinActivate, REAPER,
WinWaitActive, REAPER ,
Send, +\
Sleep, 100
Send, {F2}
WinWait, Media Item Properties,
IfWinNotActive, Media Item Properties, , WinActivate, Media Item Properties,
WinWaitActive, Media Item Properties,
WinSetTitle, Use UP and DOWN to adjust volume then ENTER,
Send, {TAB 19}
WinWaitClose,
Send, u
Send, {Esc}
return
```

The illustration (right) shows how the Media Properties dialog box now looks when this macro is executed.



19.3.10 Some Other Item Properties Macros

Now that we've got a macro that lets you create an item from any selected area and then easily adjust the volume of that item, we can take it one step further. We are going to create a couple of macros that will let us tweak the volume level of any selected item as the item is played back.

The first two examples that follow, using **Win Up Arrow** and **Win Down Arrow** as shortcut keys can be used to do this. Also included are some additional similar examples.

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Increase Item Volume a Little

```
;Win Up - increase volume a little on selected item
#Up::
Send, {F2}
WinWait, Media Item Properties,
IfWinNotActive, Media Item Properties, , WinActivate, Media Item Properties,
WinWaitActive, Media Item Properties,
Send, {TAB 19}
Send, {Up}
Send, {Enter}
return
```

Decrease Item Volume a Little

```
;Win Down - decrease volume a little on selected item
#Down::
Send, {F2}
WinWait, Media Item Properties,
IfWinNotActive, Media Item Properties, , WinActivate, Media Item Properties,
WinWaitActive, Media Item Properties,
Send, {TAB 19}
Send, {Down}
Send, {Enter}
return
```

Increase Item Volume More

```
;Win Ctrl Up - increase volume more on selected item
#^Up::
Send, {F2}
WinWait, Media Item Properties,
IfWinNotActive, Media Item Properties, , WinActivate, Media Item Properties,
WinWaitActive, Media Item Properties,
Send, {TAB 19}
Send, {Up 3}
Send, {Enter}
return
```

Decrease Item Volume More

```
;Win Ctrl Down - decrease volume a little on selected item
#^Down::
Send, {F2}
WinWait, Media Item Properties,
IfWinNotActive, Media Item Properties, , WinActivate, Media Item Properties,
WinWaitActive, Media Item Properties,
Send, {TAB 19}
Send, {Down 3}
Send, {Enter}
return
```

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Pan Item a Little Further Right

```
;Win Right - Pan selected item a little further right
#Right::
Send, {F2}
WinWait, Media Item Properties,
IfWinNotActive, Media Item Properties, , WinActivate, Media Item Properties,
WinWaitActive, Media Item Properties,
Send, {TAB 20}
Send, {Up}
Send, {Enter}
return
```

Pan Item a Little Further Left

```
;Win Left - Pan selected item a little further left
#Left::
Send, {F2}
WinWait, Media Item Properties,
IfWinNotActive, Media Item Properties, , WinActivate, Media Item Properties,
WinWaitActive, Media Item Properties,
Send, {TAB 20}
Send, {Down}
Send, {Enter}
return
```

Pan Item Further Right

```
;Win Ctrl Right - Pan selected item a little further right
#^Right::
Send, {F2}
WinWait, Media Item Properties,
IfWinNotActive, Media Item Properties, , WinActivate, Media Item Properties,
WinWaitActive, Media Item Properties,
Send, {TAB 20}
Send, {Up 3}
Send, {Enter}
return
```

Pan Item Further Left

```
;Win Ctrl Left - Pan selected item a little further left
#^Left::
Send, {F2}
WinWait, Media Item Properties,
IfWinNotActive, Media Item Properties, , WinActivate, Media Item Properties,
WinWaitActive, Media Item Properties,
Send, {TAB 20}
Send, {Down 3}
Send, {Enter}
return
```

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19.3.11 Some Window Switching Macros

A Simple Window Switching Macro

This macro switches focus between the Main Track View and the Mixer Window, making one or the other the active window. In this example, it is assigned the shortcut **Ctrl 1** but of course you can use whatever key combination you like.

```
;Ctrl 1 - Switch Windows
^1::
SetTitleMatchMode, 2
IfWinActive, REAPER,
{
WinActivate, Mixer
}
Else
{
WinActivate, REAPER
}
Sleep, 20
return
```

A File Save Macro

You may have noticed that within REAPER the keyboard shortcut for the save command – **Ctrl S** – is context sensitive. For example, if your main Track View has focus, then pressing these keys will save the project file. If, on the other hand, an FX window has focus, pressing these keys will cause you to be prompted to save the current FX chain.

This default behaviour can be convenient in some circumstances but irritating at others. The macro below will always switch focus to the Track View window, save the current project file, then return focus to whatever window had focus when the keyboard shortcut (in this example **Ctrl Shift Q**) was pressed.

```
;Ctrl Shift Q - Save File
^+q::
SetTitleMatchMode, 2
WinGetActiveTitle, ActWin
WinGet, REAPER
WinWait, REAPER,
IfWinNotActive, REAPER, , WinActivate, REAPER,
WinWaitActive, REAPER ,
Send, {CtrlDown}s{CtrlUp}
WinActivate, %ActWin%
WinWaitActive, %ActWin%
Return
```

Explanation

Command	Description
WinGetActiveTitle	Captures the name of the current active window into a variable called ActWin
WinActivate, %ActWin%	Activates the window that we called ActWin at the start of the macro

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19.3.12 File Rendering Macros

Consider the example where you prefer to record using 24 bit .WAV files, perhaps sampled at 88.2 KHz but that when it comes to rendering you sometimes need 16 bit Stereo wave files at 44.1 KHz (for CD), and sometimes MP3 files for your web site. The two macros below enable you easily to switch between both sets of settings. In both cases, they were recorded with AutoScriptWriter, then copied and pasted into the Reaper.ahk file, where they were edited. As they stand, each macro will open the **File, Render to File** dialog box, change the settings as required, then let you make a visual check before you confirm them.

```
;Win Ctrl W - Render as WAV
#^w::
SetTitleMatchMode, 2
WinWait, REAPER,
IfWinNotActive, REAPER, , WinActivate, REAPER,
WinWaitActive, REAPER ,
Send, ^!r
WinWait, Render to file,
IfWinNotActive, Render to file, , WinActivate, Render to file,
WinWaitActive, Render to file,
MouseMove, left, 206, 86
MouseMove, left, 148, 180
MouseMove, left, 353, 86
MouseMove, left, 334, 117
MouseMove, left, 259, 201
MouseMove, left, 153, 153
MouseMove, left, 181, 311
MouseMove, left, 161, 331
MouseMove, left, 227, 348
MouseMove, left, 2481, 712
Return

;Win Ctrl 3 - Render as MP3
#^3::
SetTitleMatchMode, 2
WinWait, REAPER,
IfWinNotActive, REAPER, , WinActivate, REAPER,
WinWaitActive, REAPER ,
Send, ^!r
WinWait, Render to file,
IfWinNotActive, Render to file, , WinActivate, Render to file,
WinWaitActive, Render to file,
MouseMove, left, 431, 314
MouseMove, left, 237, 415
MouseMove, left, 209, 87
MouseMove, left, 180, 185
MouseMove, left, 352, 84
MouseMove, left, 451, 115
MouseMove, left, 298, 204
MouseMove, left, 133, 148
MouseMove, left, 172, 343
MouseMove, left, 140, 362
MouseMove, left, 299, 344
MouseMove, left, 241, 380
MouseMove, left, 570, 345
MouseMove, left, 488, 547
MouseMove, left, 300, 377
MouseMove, left, 124, 427
Return
```

Notes:

1. The macros on this page use the **SetTitleMatchMode** command. This command determines the way in which AutoHotkey interprets Window Titles. This topic is explained in more detail later in this section.
2. With Macros like these, your first mouse click after opening the *Render to File* dialog box should be to select the Output Format. This ensures that the correct set of options will then be displayed for you.

Caution:

For macros such as these, you should record your own mouse clicks, then copy, paste and edit, rather than copying text from this document.

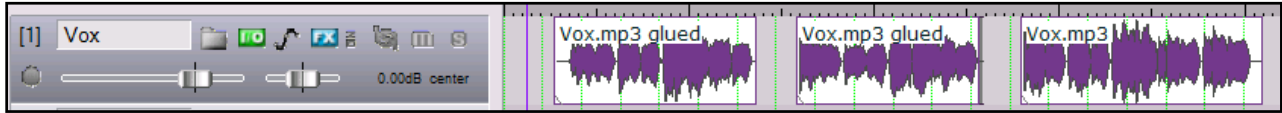
Your co-ordinates may differ from those used in the examples.

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19.3.13 Using Loops and Program Control

This next example starts to take you to the kind of task where AHK is really useful – using a loop to repeat a task several times.

Consider the example shown here:



In this example a track consists of three media items. We are going to create a macro which will move from the start of the track to the end, dropping markers at the start and end of each media item.

Please remember, again, that the technique is more important than the actual example. Also, the method used here will not be the most sophisticated available, rather the simplest. This is designed to help you to understand the concepts.

Before attempting this macro, you should open a project file which includes at least one track with several disconnected media items, as shown in the illustration at the foot of the previous page.

Example

This example assumes that under **Options, Preferences, Keyboard/Control** you have the following assignments. Of course, you can use other keyboard assignments, but if you do so you will need to modify the macro accordingly.

Keyboard Shortcut	Assignment
Shift Q	Item Navigation: Select and move to next item Markers: Insert marker at current position Item Navigation: Move cursor right to edge of selected item Markers: Insert marker at current position
W	Transport: Go to start of project
U	Item: Unselect all items

The Macro Code

The macro code below can be copied and pasted from this PDF File

```
;Win ctrl m - Drop Markers at start and end of each media item
#^m::
Send, w
SetTitleMatchMode, 2
InputBox, HowMany, Question , How Many Items?, , 400, 150, 10, 10
WinWait, REAPER,
IfWinNotActive, REAPER, , WinActivate, REAPER,
WinWaitActive, REAPER,
Loop %HowMany%
{
Send, +q
Sleep, 500
}
```

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```

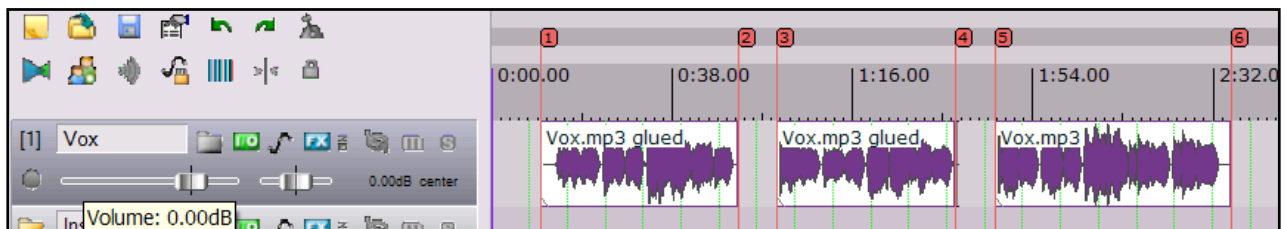
Sleep, 500
WinActivate, REAPER
Send, w
Sleep, 500
Send, u
return

```

Explanation:

Command	Description
SetTitleMatchMode	During execution of this macro, control will be passed to AHK which will display an Input Box asking us how many items we wish to drop markers for. After answering this question. we will then want to pass control back to REAPER. Title match mode 2 lets AHK recognise as valid any window that includes REAPER in its title, regardless of the project name.
InputBox	This causes AHK to prompt us to enter the number of items for which we require markers to be dropped. For a more detailed explanation of the various arguments this command uses, see the AHK Help program.
WinWait, REAPER, IfWinNotActive, REAPER, , WinActivate, REAPER, WinWaitActive, REAPER, Loop %HowMany%	AHK waits for REAPER to become the active window before continuing by starting the loop. The number of times the commands inside the loop will be executed will be determined by the response to the previous InputBox. All commands between the { and the } will be repeated that number of times
Send, +q Sleep, 500	The REAPER Shift Q Keyboard macro is executed, followed by a half second delay.
Sleep, 500 WinActivate, REAPER Send, w Sleep, 500 Send, u	After the markers have all been dropped, the cursor is returned to the start of the timeline, and the last selected item is unselected.

After running this macro, and entering the number **3** when asked how many items you have, this project will look like this:



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19.3.14 Variation: Pausing within a Loop for Dialog Box Input

Below is listed a variation of the above macro. This example will also drop markers at the start and end of each item. The main difference is that this time you will be prompted to enter a name for each marker, rather than have them automatically named 1, 2, 3, 4 etc.

The following REAPER keyboard assignments are assumed:

Keyboard Shortcut	Assignment
Shift 1	Item Navigation: Select and move to next item Markers: Insert and/or edit marker at current position
Shift 2	Item Navigation: Move cursor right to edge of selected item Markers: Insert and/or edit marker at current position

The Macro Code

```
;Win ctrl n - Drop Named Markers at start and end of each media item
#^n::
Send, w
SetTitleMatchMode, 2
InputDialog, HowMany, Question , How Many Items?, , 400, 150, 10, 10
WinWait, REAPER,
IfWinNotActive, REAPER, , WinActivate, REAPER,
WinWaitActive, REAPER,
Loop %HowMany%
{
Send, +1
WinWait, Marker,
IfWinNotActive, Marker, , WinActivate, Marker,
WinWaitClose, Marker,
Send, +2
WinWait, Marker,
IfWinNotActive, Marker, , WinActivate, Marker,
WinWaitClose, Marker,
}
Sleep, 500
WinActivate, REAPER
Send, w
Sleep, 500
Send, u
return
```

Notice how this example uses the **WinWaitClose** command to ensure that the *Add Marker* window will retain focus until it is closed.

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19.3.15 Conditional Loops

This next example introduces you to the conditional loop. The macro itself will start at the currently selected track and work down through all the tracks asking if you want include that track in a selection to be soloed track.

Again, the main purpose of this example is to teach the concepts, not the actual example. It introduces three new concepts:

- The Message Box to capture user input.
- The conditional **If** statement to act on that input.
- The use of a key such as **Esc** to break out of a loop.

This example assumes that under **Options, Preferences, Keyboard/Control** you have the following assignments. Of course, you can use different keyboard assignments, but if you do so you will need to modify the macro accordingly.

Keyboard Shortcut	Assignment
Ctrl 1	Track: Unsolo All Tracks
Ctrl Alt Shift S	Track: Toggle Solo for Selected Tracks
Down	Track: Go to next track

Note: This macro will not work if track height is minimised. You will therefore need to make sure that track height is not minimised before running this macro, or else include an extra line such as **Send, {PgUp}** near the start of the macro.

1. Copy and Paste the following Macro Code into your Reaper.ahk file.
2. Save the file and reload it.
3. Make sure that track height is not minimised.
4. Select Track 1 in the Track Control Panel, then press **Win Ctrl S** to run this macro.

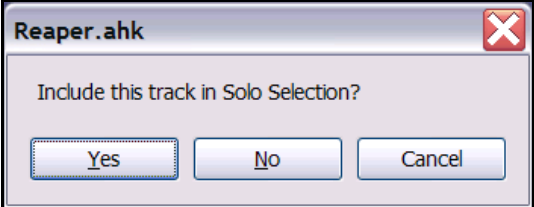
The Macro Code

```
;Win Ctrl S - Solo tracks as specified
#^s::
SetTitleMatchMode, 2
WinWait, REAPER,
IfWinNotActive, REAPER, , WinActivate, REAPER,
WinWaitActive, REAPER,
Send, ^1
Loop
{
WinWait, REAPER,
IfWinNotActive, REAPER, , WinActivate, REAPER,
WinWaitActive, REAPER,
MsgBox, 3,, Include this track in Solo Selection?
IfMsgBox Yes
{
WinWait, REAPER,
IfWinNotActive, REAPER, , WinActivate, REAPER,
WinWaitActive, REAPER,
```

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```
        Send, ^!+s
        Send, {Down}
    }
else IfMsgBox No
{
    WinWait, REAPER,
    IfWinNotActive, REAPER, , WinActivate, REAPER,
    WinWaitActive, REAPER,
    Send, {Down}
}
else IfMsgBox Cancel
{
    Break
}
}
return
```

The following comments help explain some of the new commands introduced here:

Command	Description
MsgBox	<p>This causes a message to be displayed on the screen and waits for an answer. In this case – MsgBox type 3 – the answer is supplied by clicking on one of three buttons, Yes, No or Cancel. Cancel is equivalent to pressing the Esc key.</p> <p>For more information about the different types of message box available, see the AHK Help files.</p> 
IfMsgBox Yes { WinWait, REAPER, IfWinNotActive, REAPER, , WinActivate, REAPER, WinWaitActive, REAPER, Send, ^!+s Send, {Down} }	<p>The lines of instructions enclosed within the curly braces { and } are to be executed if and only if the user selects Yes in response to the message box. Similarly, the Else statements that follow will each be executed only if its specific condition is met.</p>
Break	If Cancel is selected or the Esc key is pressed, the loop will be broken.

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19.3.16 Another Way of Exiting a Loop

The following example is a modification of the earlier Drop Markers macro.

The difference is that instead of prompting for the number of items at the start (which might be inconvenient or difficult to count), this time the loop will be repeated indefinitely until the **Esc** key is held down for a moment.

```
;Win Ctrl m - Drop Markers at start and end of each media item
#^m::
SetTitleMatchMode, 2
MsgBox, 0, , Press [Enter] to continue. When finished, press [Esc] ...
Loop
{
WinWait, REAPER,
IfWinNotActive, REAPER, , WinActivate, REAPER,
WinWaitActive, REAPER,
Send, +q
Sleep, 500
    GetKeyState, state, Esc
    if state = D
        break
}
WinWait, REAPER,
IfWinNotActive, REAPER, , WinActivate, REAPER,
WinWaitActive, REAPER,
Send, w
Send, u
return
```

The following comments help explain the new commands introduced here:

Command	Description
MsgBox	In this case, Message Box type 0 is used – this displays the message with only one button, OK . Pressing Enter is the equivalent of choosing OK .
GetKeyState	This is used to return information about a key, in this case the Esc key. The state can be D (down) or U (up). If held down at this point, therefore, the Loop will be broken.

19.3.17 More AutoHotkey Features

In this section we have barely dipped our toes in the water, to take a brief look at some of AHK's most basic capabilities.

To learn more, read the tutorial and other information in the AHK Help files. Also, visit the forums on the AHK web site, <http://www.autohotkey.com>.

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19.3.18 Passing Values into Dialog Box Parameters

The example below will open the **Item Properties** dialog box for any currently selected item and set the length of the fadeout for that media to 5 secs. Again, what is important here is not so much the example itself as the technique it demonstrates:

Example

```
;Win 5 - five second fadeout
#5::
SetTitleMatchMode, 2
WinWait, REAPER,
IfWinNotActive, REAPER, , WinActivate, REAPER,
WinWaitActive, REAPER ,
Send, +\
Sleep, 100
Send, {F2}
WinWait, Media Item Properties,
IfWinNotActive, Media Item Properties, , WinActivate, Media Item Properties,
WinWaitActive, Media Item Properties,
ControlSetText, Edit4, 0:05.000
Send, {Enter}
return
```

Content	Explanation
ControlSetText	This command is used to enter text into a field within a Dialog Box
Edit4	<p>This identifies the fourth Edit box in the dialog box as being then one into which the text is to be entered.</p> <p>You can also work with combo boxes, drop down lists and so on. For more information about how to do this, see the AutoHotKey documentation.</p>
0:05.000	In this example, this is the value that is to be entered into the edit field.

Other related AutoHotKey commands include:

- ControlGet
- ControlGetText
- ControlMove
- ControlSend

For examples of how to use all of these commands you should consult the AutoHotKey documentation.

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19.3.19 A Few Tips and Tricks

Activating the REAPER Window

You will have noticed that several of the examples used in this section include code similar to the following:

```
SetTitleMatchMode, 2
WinWait, REAPER,
IfWinNotActive, REAPER, , WinActivate, REAPER,
WinWaitActive, REAPER ,
```

The effect of this code is to ensure that if you have other applications open when you execute the macro, and perhaps one of those other applications is active at the time, AHK will automatically make REAPER the active application and then activate the macro.

Moving a Window

Many of the examples used in this section have opened various REAPER windows for you to perform certain tasks. You might want the specified window to open in a particular area of the screen, perhaps so as to leave most of your track view uncovered.

This can be achieved using the **WinMove** command.

Example:

```
WinMove, 0, 0
```

This tells AHK to move the current Window to the top left corner of the screen.

Waiting for a Key to be Pressed

Another way of pausing an AHK macro is to tell it to wait until a specified key is pressed or released.

This can be achieved using the **KeyWait** command.

Example:

```
KeyWait, Esc , D
```

This tells AHK to wait until the **Escape** key is pressed down.

Remapping Functions

Another handy feature of AutoHotkey is that it enables you to remap, within a macro, the functions of any key or mouse button. Here are some examples:

Command	Explanation
MButton::Shift	Makes the middle button behave like the Shift key.
RAlt::RButton	Makes the right Alt key behave like the right mouse button.
RAlt::AppsKey	Makes the right Alt key become the Apps key (which is the key that opens the context menu).

For more information about this and other AutoHotkey features, see the AutoHotKey Help Files.

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19.3.20 Using the AutoHotkey GUI Interface

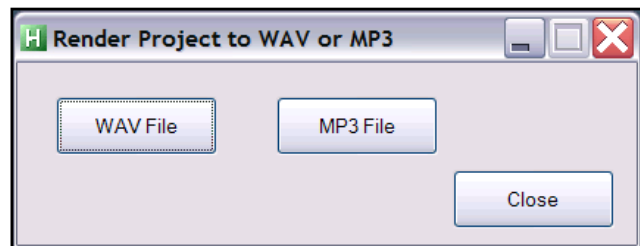
In this section, you will be introduced to a simple example of how you can use **SmartGUI** to create your own GUI interface for use with REAPER. **SmartGUI** is an AHK program used to create your own dialog boxes like the one shown below, in this case to manage your AHK macros.

You will need to have created the following two macros (described earlier in this section) before you can work through the example that follows:

Macro	Explanation
Win Ctrl W	Open File, Render dialog box and specify settings ready for rendering as 16 bit wave file, with various other parameters also set.
Win Ctrl 3	Open File, Render dialog box and specify settings ready for rendering as MP3 file, with various other parameters also set.

We will be creating the dialog box shown on the right, so that we can easily select whether we wish to render to WAV or MP3.

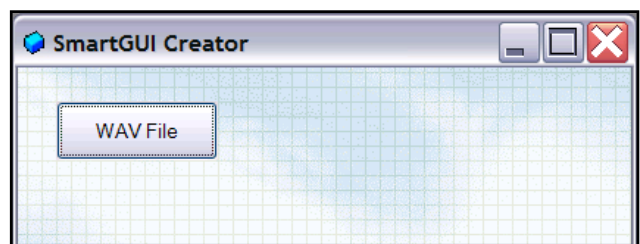
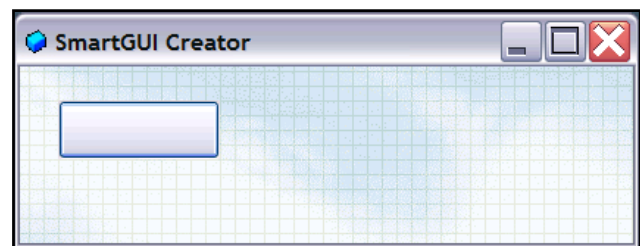
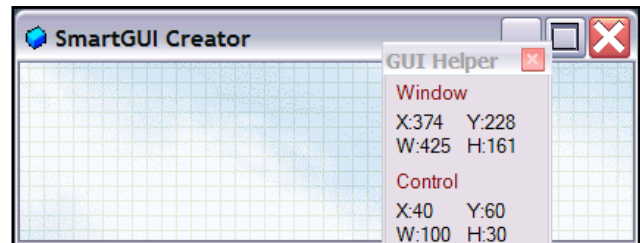
Please remember that this is an example only. The main purpose of this exercise is to demonstrate how to use the **SmartGUI** program.



Method

1. Double-click on **SmartGUI.exe** within your AutoHotkey program folder, probably inside C:\Program Files\AutoHotkey. This will start the SmartGUI program. Of course, if you prefer, you can create a desktop shortcut for this purpose.
2. Use your mouse to size this window approximately as shown above right.
3. Right click over the grid, choose **Add Button** then click and drag to define the button size and area approximately as shown (right).
4. Right click over the button, choose **Change Label** and enter the text as shown below right.
5. Now add two more buttons as shown in the illustration just below the table above.
6. To save your work, right click over the grid area and choose **Save GUI**.

When prompted type a name such as **RenderGUI** and click on **Save**.



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7. Close the **SmartGUI Creator** interface.
8. Use your text editor to open the file **RenderGUI.ahk**. Notepad can be used for this, but a freeware program such as **Edit Pad Lite** is better because it lets you keep several files open at once and remembers a recently edited files list. The code you see should resemble this:

```
; Generated using SmartGUI Creator 3.5.1

Gui, Add, Button, x26 y23 w110 h40, WAV File
Gui, Add, Button, x176 y23 w110 h40, MP3 File
Gui, Add, Button, x296 y73 w110 h40, Close
Gui, Show, x408 y749 h124 w421, Generated using SmartGUI Creator 3.5.1
Return

GuiClose:
ExitApp
```

9. Change the text on the **Gui, Show** line as indicated below. This will change the title of the dialog box.

```
; Generated using SmartGUI Creator 3.5.1

Gui, Add, Button, x26 y23 w110 h40, WAV File
Gui, Add, Button, x176 y23 w110 h40, MP3 File
Gui, Add, Button, x296 y73 w110 h40, Close
Gui, Show, x408 y749 h124 w421, Render Project to WAV or MP3
Return

GuiClose:
ExitApp
```

10. For convenience, we are going to move this into our REAPER.ahk macros file. Select all the text, then press **Ctrl C**.
11. Use your text editor to open the file **REAPER.ahk** then move to the very end of this file. Press **Enter** then **Ctrl V** to paste in the code.
12. Close the original file, so that only **REAPER.ahk** is open.
13. We now have to add to this code the necessary lines to assign a hot key to this macro, and to tell AutoHotkey what to do when this interface is displayed and any of the buttons is clicked.
14. Edit this macro to include the extra lines shown below in bold face.

```
;Win Alt R - Render project to WAV or MP3 file
; Generated using SmartGUI Creator 3.5.1

#!r::
Gui +AlwaysOnTop
Gui, Add, Button, x26 y23 w110 h40, WAV File
Gui, Add, Button, x176 y23 w110 h40, MP3 File
Gui, Add, Button, x296 y73 w110 h40, Close
Gui, Show, x408 y749 h124 w421, Render Project to WAV or MP3
Return

ButtonWAVFile:
Send, #^w::
Return
```

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```
ButtonMP3File:
Send, #^3::
Return
```

```
ButtonClose:
GuiClose:
Gui, Destroy
```

15. Now, **Save** the REAPER.ahk file and close your text editor.
16. If REAPER is already open, reload the REAPER.ahk file. Otherwise, press **Win R** to start both REAPER.ahk and the REAPER program.
17. Press **Win Alt R** and enjoy!

Hopefully you might find the following comments helpful

Code	Explanation
<code>Gui +AlwaysOnTop</code>	This ensures that our dialog box will always remain on top, i.e. above the REAPER window.
<code>Gui, Show, x408 y749 h124 w421,</code>	The x and y parameters determine the position of the dialog box on the screen. Of course, yours might not be the same as in this example. By changing these you can vary the position. The parameters h and w determine the height and width of the box.
<code>ButtonWAVFile: Send, #^w:: Return</code>	Notice that the space shown on the name on the button itself is omitted here. This little subroutine determines what action is taken when this particular button is closed. In this example, the Win Ctrl W macro is executed.
<code>ButtonClose: GuiClose: Gui, Destroy</code>	This subroutine ensures that clicking the Close button, or the X at the right end of the title bar, will remove the dialog box.

Note: *This of course has been only a very basic introduction to using the **SmartGUI** interface. For more information, consult both the HTML SmartGUI manual that is supplied with the program, and the AHK Help files, especially the GUI section.*

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Notes

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20 ReaRoute: Using REAPER with Other Audio Apps

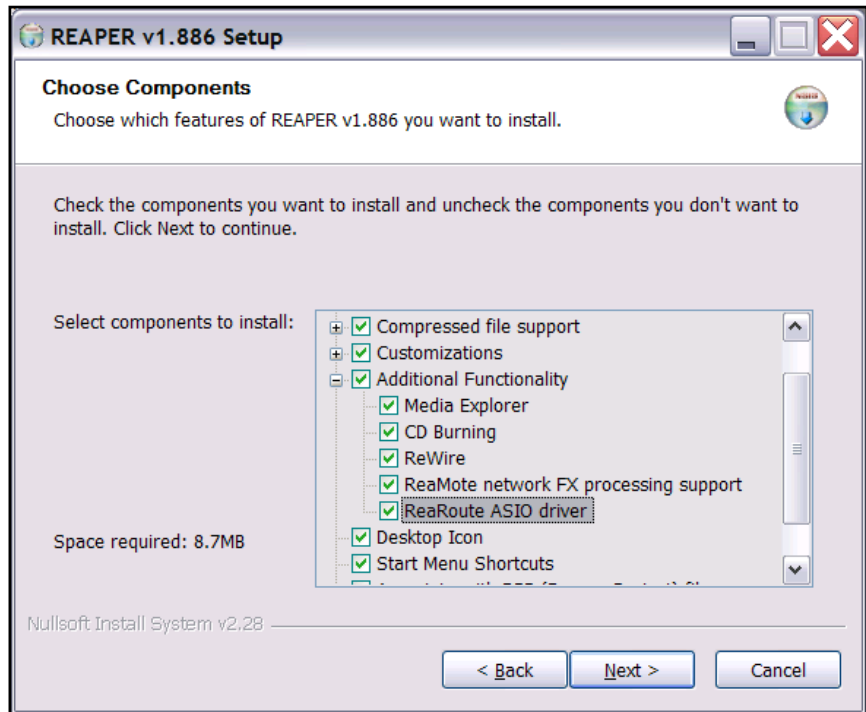
20.1 What is ReaRoute?

ReaRoute is an ASIO driver that allows you to route audio to and from any other ASIO enabled application. ReaRoute is only installed on your system if you select the **ReaRoute ASIO driver** during the REAPER installation process.

This option is found on the REAPER Setup screen on the **Choose Components** page (shown right), under the heading **Added Functionality**.

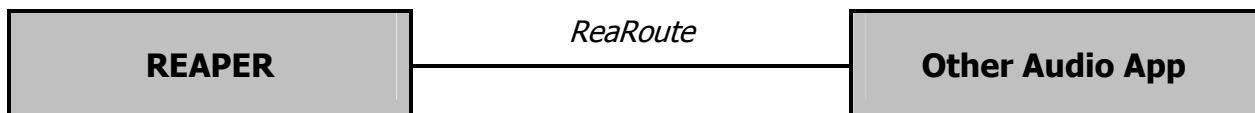
If you did not have this option selected (or if in doubt) when you last installed REAPER, simply reinstall REAPER, this time making sure that you have this option selected.

When you choose to install ReaRoute, the **ReaRoute ASIO driver** appears in the ASIO driver list for the other audio applications on your system.



Note: Some users have reported problems with native ASIO drivers after installing the ReaRoute driver. If you experience problems with your ASIO drivers after installing this feature, uninstall REAPER, then re-install with this check box cleared.

Once ReaRoute has been installed, you can pass audio streams between REAPER and other audio applications. In this example, we will use the example of sharing audio between REAPER and Sonar. The same principles apply, however, if you are working with an application such as Cubase or Ableton Live instead of Sonar.



In this section, you will be introduced to using ReaRoute by working through the following tasks:

- Setting up Sonar (or any other DAW application of your choice) to work with ReaRoute.
- Sending a project out from REAPER to that app and recording it track by track within that app.
- Sending a project from Sonar to REAPER, this time bringing it in as a series of submixes. You can then apply REAPER features to that project.
- Using a synthesizer workstation such as Project 5 in conjunction with REAPER.

Please remember that the purpose of this exercise is to teach you how you can go about sharing audio between different applications. How you apply that knowledge, and what benefits you derive from it, is of course up to you.

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20.2 Setting Up Apps for ReaRoute

Before you can use any audio application with REAPER via ReaRoute, you need to ensure that the audio settings for that application are set up correctly.

There are usually one or two basic steps involved. The first is to enable **ReaRoute ASIO** as the preferred driver, the second is to enable the various input and output channels required to transmit audio between the application and REAPER. With some applications, this second step is not required. The method will vary with the application, but always involve specifying your preferences on the **Audio Settings** dialog box (or similar). The table below gives some examples. If you are using a different application, you should be able to work out what is required.

Application	Instructions
Note: Before setting up or using any application for use with ReaRoute, you should: <ul style="list-style-type: none">• Make sure that the ReaRoute ASIO Driver has been installed (see previous page), and• Make sure that REAPER is open and minimised.	
Ableton Live	<ol style="list-style-type: none">1. Options, Preferences then click on the Audio tab.2. Set Driver Type to ASIO.3. Set Audio Device to ReaRoute ASIO.4. Click on Input Config then on each input channel that you wish to enable, then OK.5. Click on Output Config then on each output channel that you wish to enable, then OK.6. Close Preferences window.
FL Studio	Options, Audio Settings , then select ReaRoute ASIO for Output . Close Audio Settings window.
Project 5	Options, Audio then under Audio Driver Selection – Outputs select ReaRoute ASIO ReaRoute Client -> REAPER 1 (ASIO) then OK .
Sonar	<ol style="list-style-type: none">1. Options, Audio, Advanced then set Driver Mode to ASIO then OK.2. Options, Audio, Drivers then disable all existing drivers (input and output)3. Options, Audio, Advanced then set Device to ReaRoute ASIO (8 in, 8 out) then OK4. Options, Audio, Drivers and enable all ReaRoute drivers, then OK. <p>Note: Sonar requires that you exit and restart the program before certain changes to audio settings are applied. Because of this, you may not be able to complete all of these steps at once – you may find that you have to close and reopen the program after each step before you can go on to the next one.</p>
Tracktion	<ol style="list-style-type: none">1. Click on the Settings tab.2. From the Wave Device drop down list choose ReaRoute ASIO.3. Click once on the red word disabled for each channel that you wish to use. The display should change for each item clicked on to green enabled.4. Click on the Projects tab when finished.

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20.3 Sending Audio From REAPER to Another DAW App

Before attempting this example, make sure that you have installed the ReaRoute ASIO Drivers and that you have set up your other DAW application (such as Cubase, Sonar, Ableton Live, Tracktion or Samplitude) to use ReaRoute Drivers, as explained on the previous page.

In this example, we are going to send a project from REAPER to Sonar. You might wish to do this, for example, to use Sonar to apply V-Vocal to a vocal track. Of course, the same principles would apply if you were using a different application other than Sonar, such as Cubase, Ableton Live, or Samplitude. Provided you know your other application well enough and have already set it up to use ReaRoute (see previous page) you should have no difficulty in applying these guidelines.

The general guidelines are:

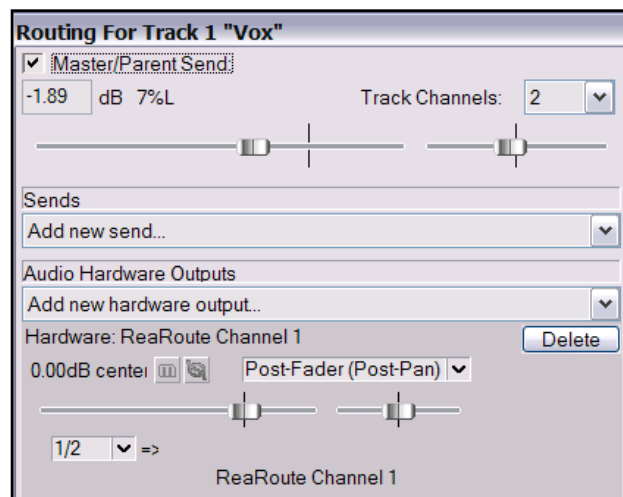
- Open REAPER. It is important that you open REAPER before the other application.
- Open the project file that you wish to use. For each track that you wish to use, set the output to a different ReaRoute channel.
- Open the other application (e.g. Sonar) and create a new project file.
- Insert into your new file one new track for each track that you wish to bring in from REAPER. For each track, the input should be set to correspond with the equivalent output used in REAPER. For example, if in REAPER you set a track's output to *ReaRoute Channel 1*, then the corresponding new track in Sonar will need to have its input set to *Left ReaRoute ASIO ReaRoute REAPER Channel 1*.
- Within the second application, start recording. Within REAPER, play the song.
- Stop both when the song finishes.
- You can then do whatever work you wish. An example follows shortly.
- When finished, first close the other application and then close REAPER. You should always remember – *Open REAPER first, close it last.*

Of course, in many cases it would be easier and quicker simply to import the wave files directly into the second application. There are, however, other instances when it may be advantageous to use ReaRoute instead. For example:

- It might not be easily possible to line up all tracks. Some may start and finish at different times. Others might consist of a large number of media items each of short duration. It would be difficult to import these piecemeal.
- Some tracks might consist of a combination of MIDI items and audio items. Many applications do not let you mix MIDI and audio on the same track. This way, they are all taken across as audio.

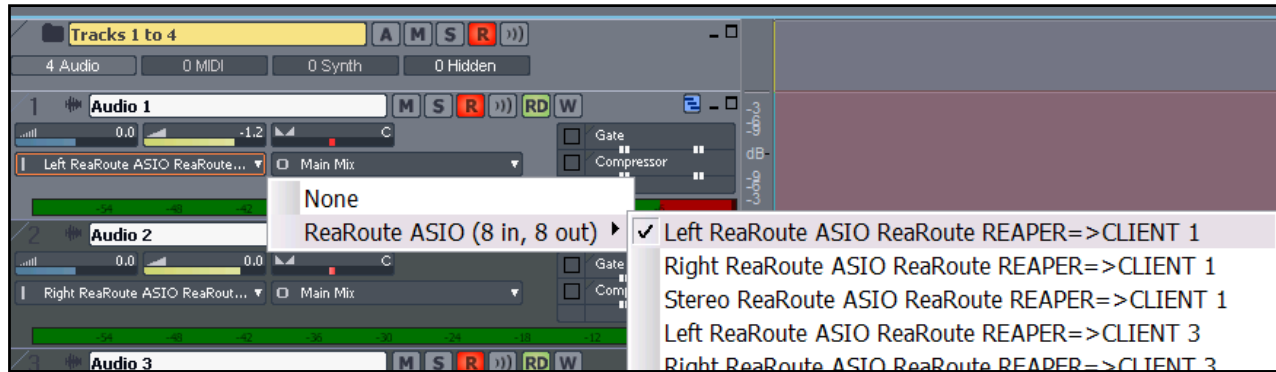
Example

1. Start REAPER. Open the file **All Through the Night.RPP** and save it as **All Through the Night REAROUTE.RPP**.
2. Select the first track. Display the I/O window for this track and direct Hardware Output to **ReaRoute Channel 1** as shown (right).
3. Similarly, direct Hardware Output for Track 2 to ReaRoute Channel 2, Track 3 to ReaRoute Channel 3, and Track 4 to ReaRoute Channel 4.
4. Save the file.

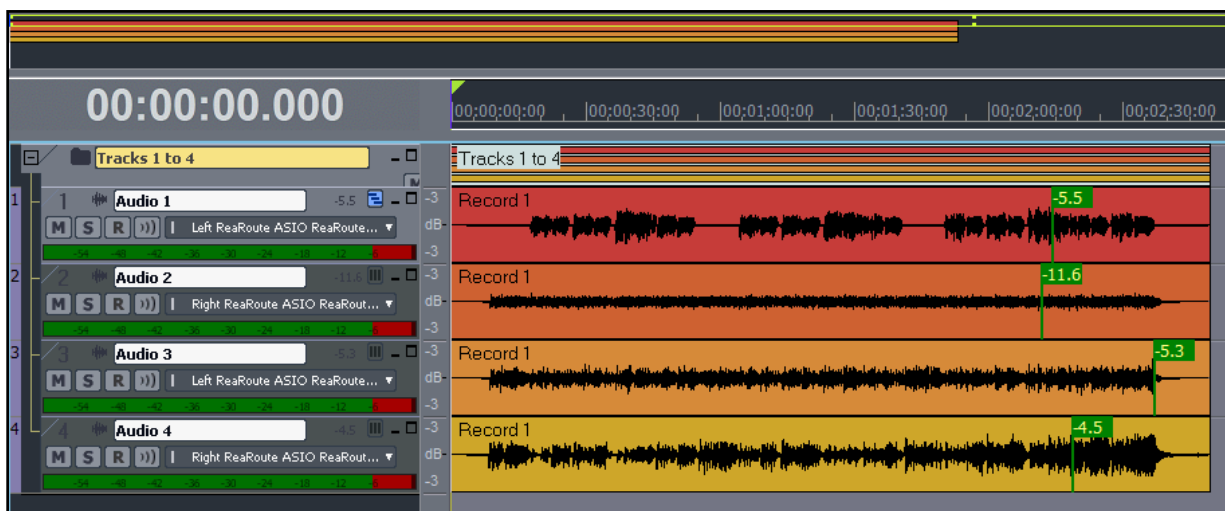


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5. Open Sonar (or whatever application you are using). These instructions assume that you are already familiar with how to give commands and perform basic tasks in this application.
6. Create a new project file containing four blank audio tracks.
7. Arm all four tracks for recording. Set the Input for **Track 1** to **Left ReaRoute ASIO** **REAPER=>CLIENT 1** as shown below.



8. Set the Input for **Track 2** to **Right ReaRoute ASIO REAPER=>CLIENT 1**, the Input for **Track 3** to **Left ReaRoute ASIO REAPER=>CLIENT 3**, and the Input for **Track 4** to **Right ReaRoute ASIO REAPER=>CLIENT 3**.
9. Save this file as **All Through the Night REAPER.cwp**
10. Start Recording.
11. Select REAPER and press Play. As the song is recorded, the track will be recorded in Sonar. Note that if any of your REAPER tracks have any active FX in their FX windows, then it will be post FX signal that will be recorded in Sonar.
12. When the song finishes, stop the recording in Sonar, then stop playback in REAPER.
13. In Sonar, unarm the four tracks.
14. The file should now resemble that shown below. **Save** this file, then wait. We will shortly be using Sonar to do some work on this file. Meanwhile, keep REAPER and Sonar both open.



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20.4 Sending Audio From Another DAW App to REAPER

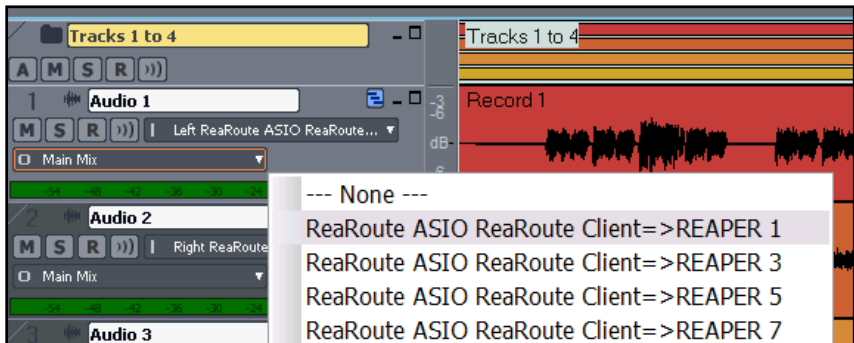
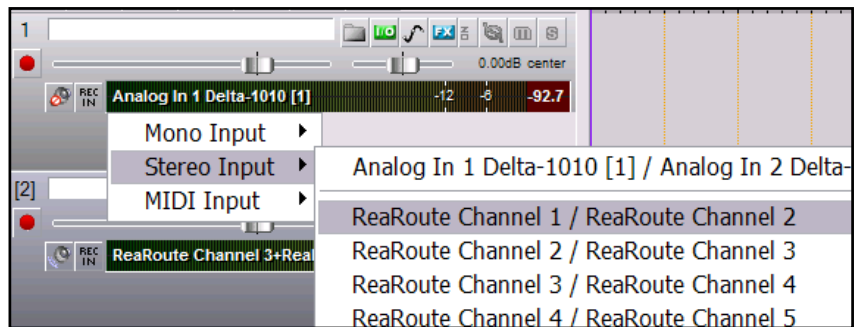
Staying with the same example, we are now going to use ReaRoute to take our open Sonar project and send an audio signal back to REAPER. In overview, this is how it is done.

- Open REAPER and create a new project file. Insert as many new tracks as you need.
- Open Sonar. In Sonar, open the file you wish to work on, and assign outputs on a track by track basis to your various ReaRoute channels as required. Arm these tracks for recording.
- Insert any FX (such as V-Vocal) that you may wish to use in your Sonar tracks.
- Assign the outputs of your Sonar tracks to the various FX channels as required.
- Play the song in Sonar, adjusting your FX to suit.
- When ready, start recording in REAPER, then play the song in Sonar from the beginning.
- When finished, stop both playback and recording.

Example

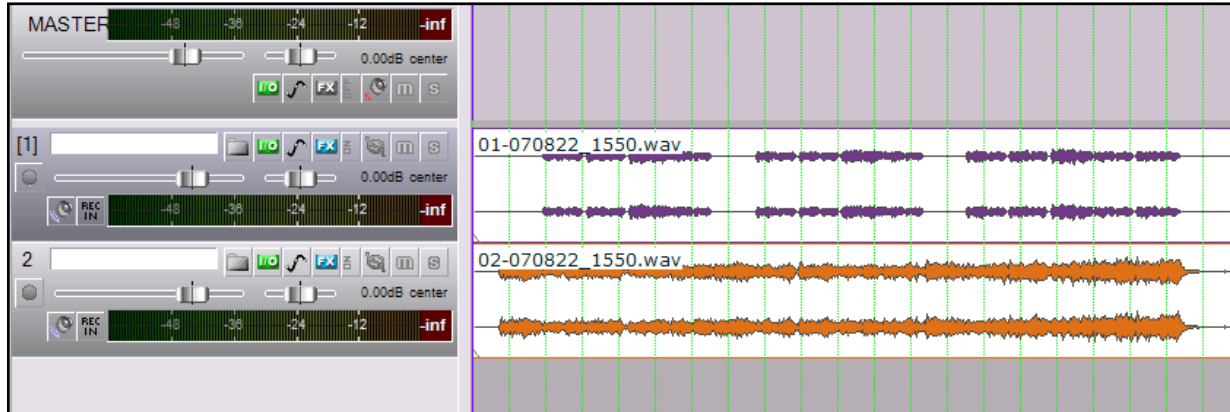
If you are carrying on from the Example in the previous section, go straight to step 3 below. Otherwise ...

1. Open REAPER.
2. Open Sonar, then open the file *All Through the Night REAPER.cwp* – this file was created in the previous example.
3. In REAPER, create a new project file. Save it as **All Through the Night SONAR.RPP**. Insert two tracks into this project. Arm both these tracks for recording.
4. For the first of these tracks, set the input to **ReaRoute Channel 1 / ReaRoute Channel 2**, as shown right.
5. For the second of these tracks, set the input to **ReaRoute Channel 3 / ReaRoute Channel 4**.
6. We are going to use Track 1 to import the Vocal track from Sonar, and Track 2 to import an instrumental submix. For both these tracks, make sure that Input Monitoring is turned on.
7. In Sonar, set the output of Track 1 to **ReaRoute ASIO ReaRoute Client => REAPER 1**, as shown right.
8. In Sonar, for tracks 2, 3 and 4 set the output to **ReaRoute ASIO ReaRoute Client => REAPER 3**



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9. In Sonar, play the song in Sonar. Adjust the panning and levels of the instrumental tracks – Track 3 40% Left, Track 3 40% Right, Track 4 Centre.
10. In Sonar, insert any Cakewalk FX required for the vocal in the Vocal Track.
11. When you are ready, in REAPER, start recording.
12. In Sonar, play the song from the beginning.
13. When finished, stop both playback and recording, then close Sonar.
14. In REAPER, unarm your tracks. Save your project, which should now look similar to this.



15. Notice that the first track contains the Vocal (with Cakewalk FX) and the second track the instrumental submix.
16. You can now finish this project in REAPER. For example, you could insert ReaComp into the Instrument Submix Track, define this track as four channels, then create a send from the Vocal Track to channels 3 and 4 of the Instrumental Track. This could then be used for audio ducking, to ensure that the voice floats smoothly above the instruments. ([Audio ducking](#) is explained in detail elsewhere this User Guide).

20.5 Using REAPER With a Synth Workstation

Project 5 from Cakewalk is a Synthesizer Workstation application. In this section, you will see how ReaRoute can be used to make the functionality of Project 5 (or any similar application) available to you when you are working with REAPER. To be able to work through this example, you will need to already know how to use Project 5 (or whichever synth app you are using) to create music.

Before proceeding with this section, you will need to ensure that your ReaRoute ASIO drivers have been installed (see Section 20.1) and that the Synth Workstation program has been set up to use them (see Section 20.2).

Example

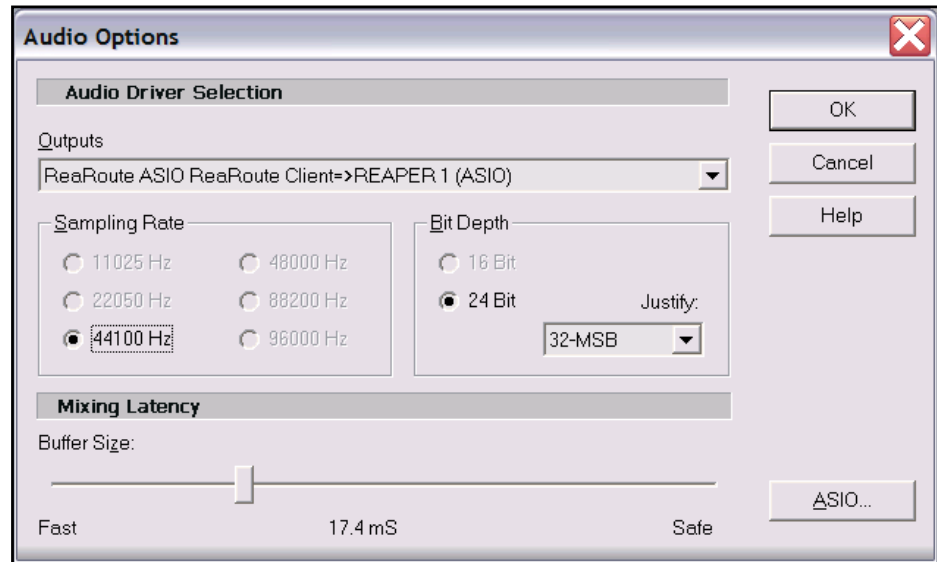
In this example, you will be shown how to use ReaRoute to allow you to use a synth workstation program such as Project 5 to record tracks onto REAPER for an existing REAPER project file.

1. Open REAPER. Open the file **All Through the Night.RPP** and save it as **All Through the Night PROJ.RPP**.
2. Add another track after the last track in this project. Your new track should be Track 5. Name this track **Synths**.
3. Arm this track for recording, turn input monitoring on and set the Track Input to Stereo, **ReaRoute Channel 1 / ReaRoute Channel 2**.

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4. Open **Project 5** and create a new project file. Choose the **Options. Audio** command and direct output to **ReaRoute ASIO ReaRoute Client => REAPER 1 (ASIO)** as shown below.
5. For this simple example, insert a synth of your choice into your Project 5 project file.

Of course, you could if you wish insert several different synths and take full advantage of the program's features, but for this simple demonstration we will confine ourselves to just the one.



6. Within REAPER, make sure your cursor is at the start of the project. Press **Record**.
7. Within Project 5, play the Synth to compose a track to accompany your REAPER song. As you do so, REAPER will record it as a wave file. This of course is additional to any activity that occurs within Project 5.
8. When you have finished, save your Project 5 file as **ReaRoute Demo.p5p** and close the program.
9. In REAPER, unarm the Synths track and save your file.

20.6 Syncing Ableton Live to REAPER

If you have ever tried using use Ableton Live with Rewire, then you might already have discovered that a serious limitation of this is that Live will not support the use of VSTis while the program is Rewired. Enter ReaRoute! In this section, you will be shown how to use ReaRoute to sync Ableton Live, thereby making sure that all your Live VSTis will still be available to you.

I am indebted to Bevosss for taking the time and trouble to research this subject and come up with a solution, and for kindly agreeing to make his material available here.

Before you can set up the connection between REAPER and Ableton Live, you must first install a virtual midi cable such as **MidiYoke**. You can download this from: <http://www.midiox.com/zip/MidiYokeSetup.msi>. After downloading, run this setup file and follow the onscreen prompts and instructions.

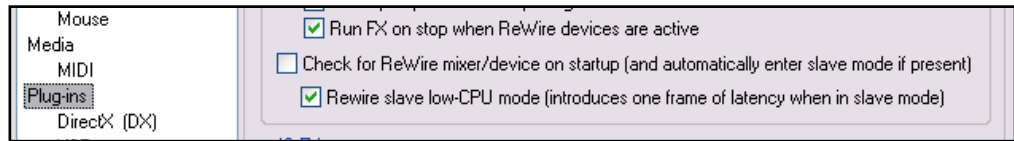
After installing MIDI Yoke, you will need to reboot your computer.

You must also, of course, have ReaRoute installed along with REAPER. Instructions for doing this can be found at the beginning of this section of the User Guide.

This example uses Ableton Live 6.0.7. The differences if you are using some other version are largely cosmetic.

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Before you begin, open REAPER and make sure that the option to **Check for Rewire mixer device on startup**



(and automatically enter slave mode if present) under **Options, Preferences, Plug-ins** is set to **Off**.

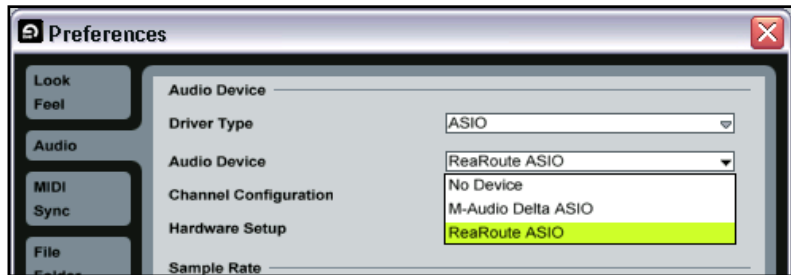
You should also ensure that **Smooth Seeking** is enabled (on REAPER's **Options** menu) if you want Live to change smoothly on the bar from REAPER.

After doing this, exit REAPER.

Example

1. In this case, you must open Live before REAPER (or Live will act as a Rewire slave). First open Live, then open REAPER. Open your REAPER Project File.

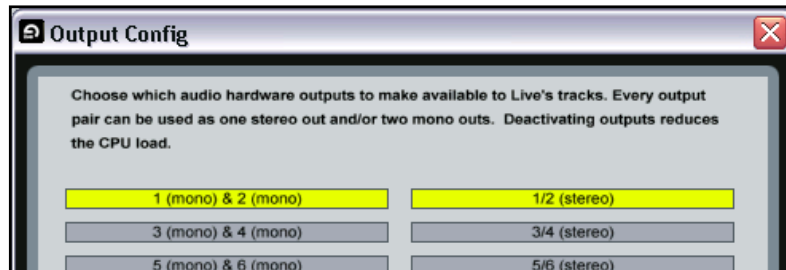
2. In Live, choose the **Options, Preferences** command and select the **Audio** category. Specify **ReaRoute ASIO** as the Audio Device.



3. Check Input configuration and Output configuration to ensure that one paired stereo input and output are selected.

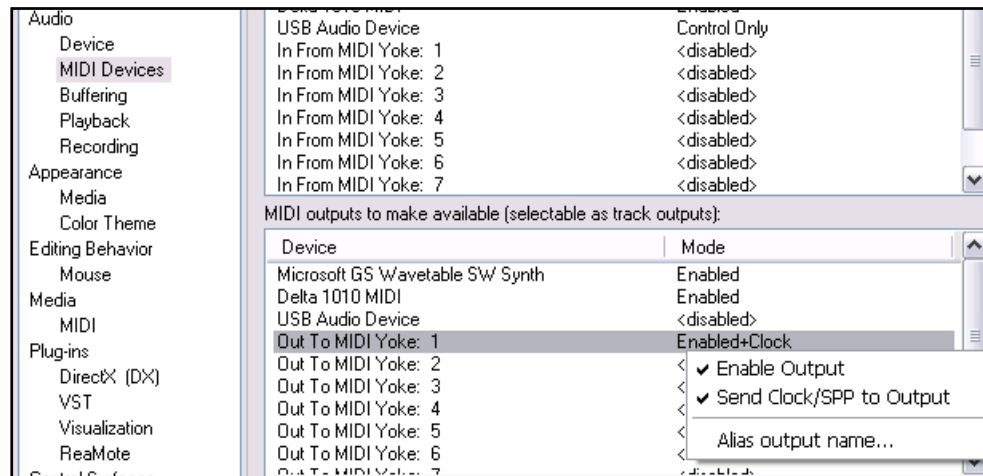
Your available options will of course depend on which sound card you are using.

An example is shown on the right. For this exercise, we will be assuming that you are using Outputs 1/2 and Inputs 1/2.



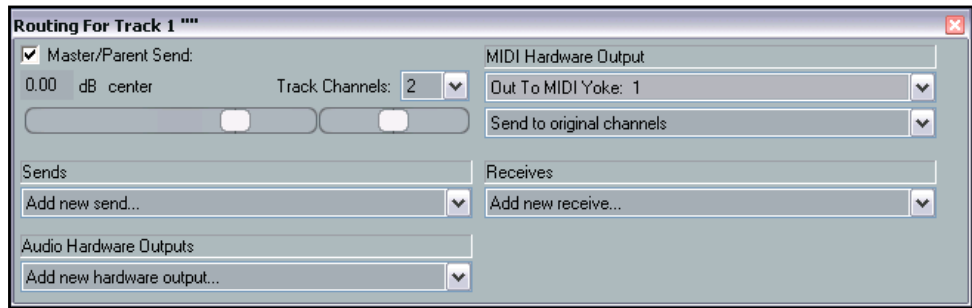
4. Close the Preferences window in Live.

5. In REAPER, Go to **Options, Preferences, Audio, MIDI Devices** and make sure that **Out to MIDI Yoke 1** is enabled, along with **Send Clock/SPP to Output**.



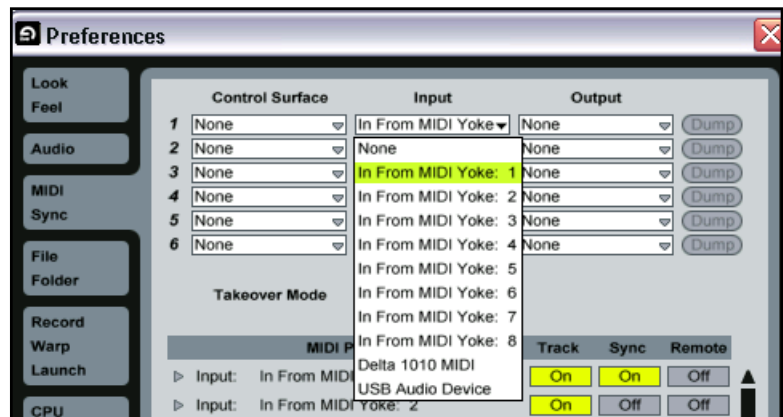
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6. Insert a track in Reaper, record arm it, select **Monitor Input**. Click on the track VU meter and select **Stereo Input-ReaRoute1/ReaRoute2**.

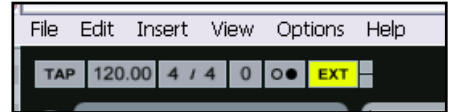


7. Click on the I/O button on the track, and under **MIDI Hardware Output**, choose **MIDI Yoke NT: 1** (see above).
8. Now switch to Live. Display the **Options, Preferences** window, then select **MIDI Sync**.

Under Input, select **In from MIDI Yoke 1** (as shown). Ensure also that both Track and Sync settings for this Input are set to **On** (as shown, right).



9. Make sure also that the **Ext** button on Live's toolbar is set to the **On** position, as shown.
10. Now open your Live project file.
11. Switch to REAPER and press play on the Transport Bar.
12. Your REAPER project will play, and Live will play along.



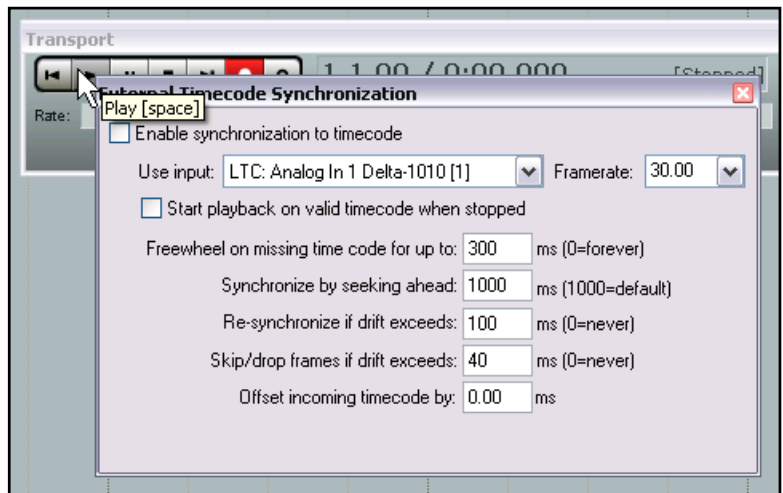
20.7 Syncing to an External Device

If you are using REAPER in conjunction with an external device then you may need to ensure that your DAW is in sync with that device, and to take its time clock from that device. For example, you may need to slave REAPER to another DAW, or to a video deck.

Another example might be if you need to upload time-stamped material from ADAT tape.

To synchronize REAPER to an external timecode, follow this sequence:

- Right click over the **Play** button on the Transport Bar. This opens the settings dialog box shown on the right.
- Select the Input to be used. Available sync types include ASIO Positioning Protocol, MTC and SPP.
- Complete the other settings and



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close the dialog box. You should consult the documentation of your external device for further information.

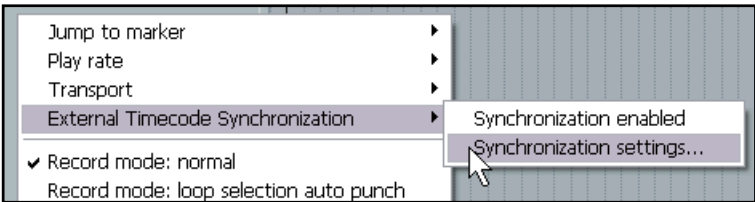
- To play REAPER in sync with an incoming timecode, hold the **Alt** key while right clicking on the play button (as shown). **Alt Right Click** toggles Sync Play on and off (see right).



REAPER Sync Types (Summary)	
Sync Type	Comment
ASIO Positioning Protocol	Creates a synchronization that is sample accurate with the external device. In other words, the time code has as many time locations as your projects sampling rate. Requires that your audio hardware uses ASIO 2.0 drivers.
Linear Time Code (LTC)	This is the same as SMPTE. It is a time based method of synchronization which uses hours, minutes, seconds and frames.
MIDI Time Code (MTC)	As its name implies, this is also a time based method of synchronization which uses hours, minutes, seconds and frames. It is simply a conversion of the SMPTE code that is transmitted vi the MIDI cable.
Song Position Pointer (SPP)	This method is based on bars, beats and subdivisions of beats. The information is transmitted along with MTC data, every six clocks or ticks. For some devices, this is all you need.

The Context Menu

The commands for enabling/disabling external timecode synchronizarion and for changing the settings are also available on REAPER's **Transport Bar** context menu and on the main **Options** menu.



Assignable Actions

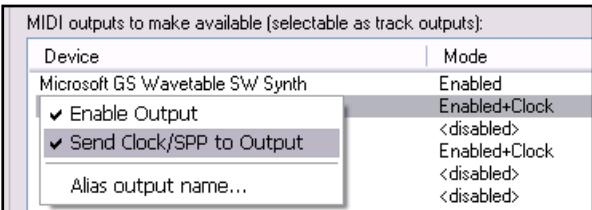
The following actions are assignable using the keyboard shortcut editor (Options, Preferences, Keyboard Shortcuts):

- Show external timecode synchronization settings.
- Toggle external timecode synchronization.

Sending Clock/SPP from REAPER to an external MIDI Device

To send Clock/SPP data from REAPER to an external MIDI device, you need to enable the feature under **Options, Preferences, MIDI Devices**.

Right click over the device name and select the option **Send Clock/SPP** to output.



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21 Some Other REAPER Features (Overview)

We've just about come to the end of this User Guide – and there's still plenty left that we haven't told you about!

Once you get up and running with REAPER, you'll find there's heaps more information available to you on the REAPER WIKI and of course through the user forums. You can find these at:

<http://www.cockos.com/wiki/>

<http://www.cockos.com/forum/>

In this section, we are just going to introduce you in overview to some of these features, just so that you'll get an idea of some of REAPER's other capabilities.

21.1 ReaMote

ReaMote is REAPER's network FX functionality. It allows you to have any FX chain in your project processed on a remote machine on your local network.

This is very useful if you have a lot of CPU consuming effects and want to add more CPU power to your project without upgrading your main host's CPU.

To set up ReaMote, simply install REAPER and whatever plug-ins you need on the slave machines. Run the ReaMote slave on the slave machines, then enable ReaMote in the **REAPER Preferences** on the master, and you're ready to go!

21.2 Rewire

REAPER also supports Rewire.

ReWire is a technology developed by Propellerhead Software that allows applications to share audio, MIDI and synchronization data. Audio and MIDI data are transferred between the two applications in real-time, allowing you to use the features in each application as if they were one.

In a ReWire session, the first application acts as the Host, and the second application acts as the Slave. The Slave receives and sends signals via the Host application.

21.3 REAPER and NINJAM

NINJAM is an innovative software program that allows musicians to collaborate in "fake time" over the Internet. The software connects to a central server where participants can share audio and text information, and has the ability to record both the local and remote channels of each "session" (audio only). REAPER has the ability to import these recorded session files to allow you to edit and mix at your leisure. "Fake time" means that some players will hear a delayed version to which they play along.

To learn more about the NINJAM software or download a copy, visit <http://www.NinJam.com>

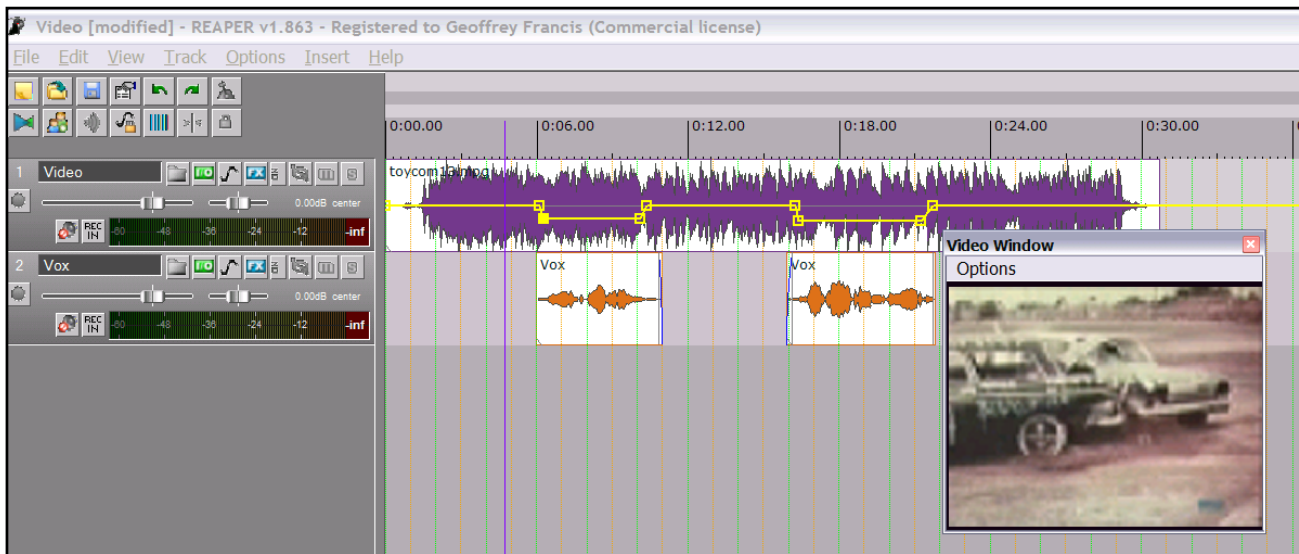
To learn more about using NINJAM with REAPER, visit the Cockos WIKI <http://www.cockos.com/wiki/>

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21.4 REAPER and Video

REAPER can be used to edit the soundtrack of your video files, such as .AVI, .MPG and .WMV files. These files are imported using the **Insert, Media File** command. In addition, you can use the **Track, Insert Track from Template** command to import data from a .EDL file. Use the **View, Show Video Window** command, **Ctrl Shift V**, to show the Video Window. Use the **Options** command within this window if you wish to resize it.

You cannot perform any video editing within REAPER, but you can work on the soundtrack. You can edit the existing soundtrack, and/or add create new tracks and media items to be mixed with it. In the illustration below, Track 1 contains the original soundtrack; Track 2 contains a voice over that has been added in REAPER.



The Audio Tracks can then be mixed down and rendered to a new .WAV file, that can be imported back into the original video file using a program such as Vegas.

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22 Right-Click Context Menus Summary

22.1 Introduction

As you get more and more accustomed to working with REAPER, you will grow to understand the importance of the right-click context menus. These are the menus that pop up when you right click your mouse over an item or area of the screen.

This section summarises the most important of these menus and lists the commands available on each of them. For more detailed explanations of individual commands, you can consult the index or search the main body of this document. If using **Acrobat Reader** or **Foxit Reader** to view this document, simply press **Ctrl F**, type the expression or phrase that you wish to seek, and then press **Enter**. To continue to search for more occurrences of the same phrase, keep the **Find** (Acrobat) or **Find Text** (Foxit) dialog box open, and either press **Enter** or click on **Find Next**.

22.2 The Track Pane Context Menu

Insert new track	Ctrl+T
Insert track from template	▶
Remove selected tracks	
Duplicate selected tracks	
Copy selected tracks to clipboard	
Cut selected tracks to clipboard	
Save selected tracks as track template...	
Render selected tracks to stem tracks (and mute/bypass originals)	
Render selected tracks to mono stem tracks (and mute/bypass originals)	
✓ Show selected tracks in mixer	
Set track colors to custom color...	
Set track colors to random colors	
Set track colors to one random color	
Set track color to default	
Set timebase for selected tracks	▶
Set automation mode for selected tracks	▶
Set automation mode for all tracks	▶
Track performance options	▶
Show master in track view	Ctrl+Alt+M

To display this menu, right click over the Track Number of any track, or elsewhere on the background area for any Track Pane.

An explanation of the menu follows.

Command	Comments
Insert track ...	Inserts a new track after the currently selected track.
Remove selected tracks	Removes (deletes) any track or tracks currently selected.
Duplicate selected tracks	Creates a duplicate of any track or tracks currently selected, immediately below the original track.
Copy selected tracks to clipboard	Copies any selected track or tracks to the Windows clipboard from which it or they can be pasted elsewhere within the current project or to a different project.
Cut selected tracks to clipboard	Cuts any selected track or tracks to the Windows clipboard from which it or they can be pasted elsewhere within the current project or to a different project.

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Command	Comments
Save selected tracks as a track template...	Saves all tracks currently selected into a single track template.
Render selected tracks to stem tracks (and bypass originals)	Renders any selected tracks to stem tracks.
Insert track from template	Displays a menu of your track templates, any of which you can use to create a new track (or series of tracks) in the current project.
Show selected tracks in mixer	Toggles on and off the display of currently selected tracks in the mixer.
Set track colors to custom color... Set track colors to random color Set track colors to one random color Set track colors to default	Any of these commands can be used to modify the colours of your currently selected tracks, as required.
Set timebase for selected tracks	Offers a sub menu of options for determining the timebase for currently selected tracks.
Set automation mode for selected tracks	Lets you change the automation mode (for example, to Write or Read) for all currently selected tracks.
Set automation mode for all tracks	Lets you change the automation mode (for example, to Write or Read) for all tracks.
Track performance options	Allows or disallows anticipative FX and/or media buffering.
Show master in track view	Toggles on and off the display of the Master in track view.

22.3 The Empty Track List Area Context Menu

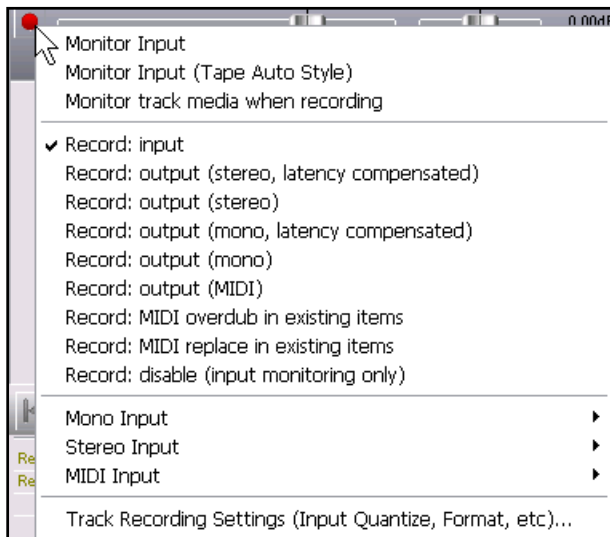
Insert track... Ctrl+T	
Insert track from template	▶
Show master track Ctrl+Alt+M	

This menu is accessed by right-clicking anywhere in the empty area below the track list in the track pane area.

Command	Comments
Insert track ...	Inserts a new track after the currently selected track
Insert track from template	Displays a menu of your track templates, any of which you can use to create a new track (or series of tracks) in the current project.
Show master track	Toggles on and off the display of the Master in track view.

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22.4 The Record Arm Context Menu



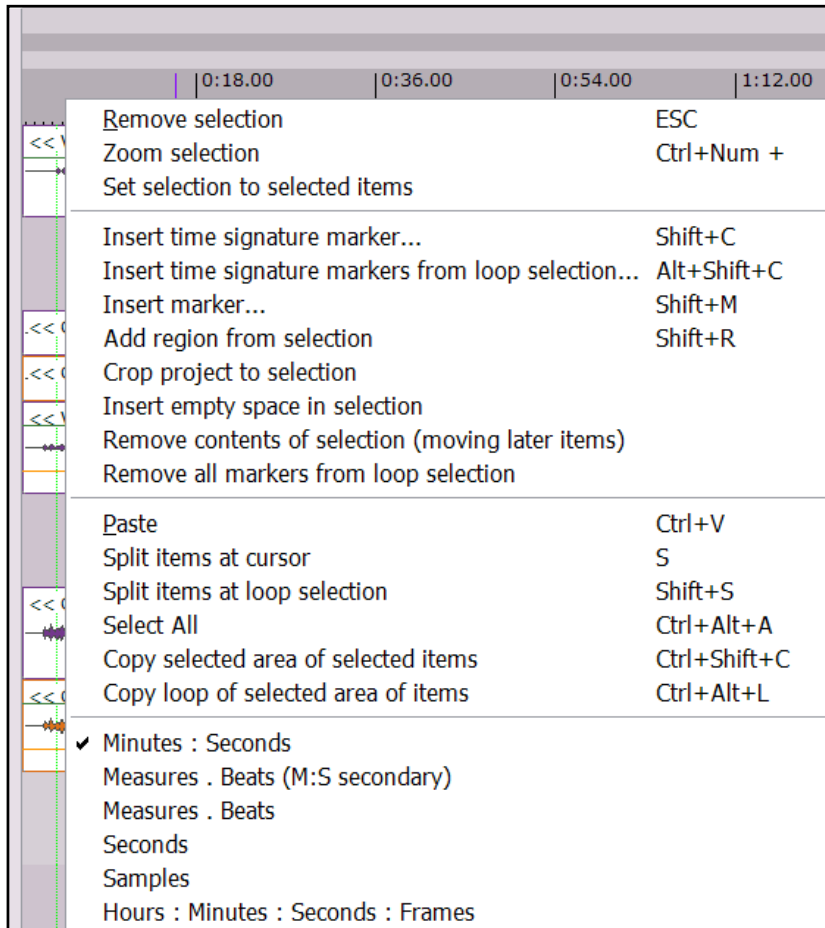
This menu is accessed by right-clicking over the Record Arm button of any track.

An explanation of the menu follows.

Command	Comments
Monitor Input ... Monitor Input (Tape Audio Style) Monitor track media when recording	The first two of these options are mutually exclusive: you should select whichever of these you prefer if you wish to use REAPER's input monitoring. You do not need to select either of these options, however, if using any input monitoring facility supplied by your sound card. Optionally, you may choose to also monitor track media when recording.
Record: input Record: output (stereo, latency comp) Record: output (stereo) Record: output (mono, latency comp) Record: output (mono) Record: output (MIDI) Record: MIDI overdub in existing items Record: MIDI replace in existing items Record: disable (input monitoring only)	In most cases, for normal recording you will want to select Record: input However, the other options (mutually exclusive) are available if and as required.
Mono Input	Displays sub menu from which to select the required mono input from your sound card.
Stereo Input	Displays sub menu from which to select the required stereo input from your sound card.
MIDI Input	Displays a menu from which to select your required MIDI device and channels
Track recording settings	Used to change recording format settings and/or input quantize settings for this track.

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22.5 The Timeline and Ruler Context Menu



This menu is accessed by right clicking the mouse in any of the following areas:

- Over the Ruler or Timeline displayed above the first track (see illustration left).
- Over the blank area above the ruler.
- Over the empty background area in the Track View area.

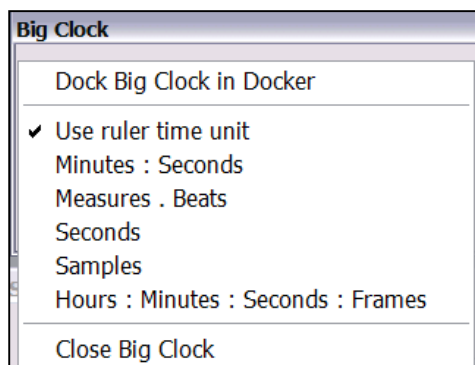
An explanation of the menu follows.

Command	Comments
Remove Selection	Deselects currently selected area. Removing the selection does not cause any media items to be deleted.
Zoom selection	Zoom to current selected area
Set selection to selected items	Makes the selection along the timeline for the whole project the same as the portion of the timeline covered by the currently selected item or items.
Insert time signature marker...	Allows you to insert a time signature marker at the current cursor position.
Insert time signature markers from time selection...	Inserts time signature markers at the start and end of the current loop selection. These time signature markers can then be edited as required.
Insert marker ...	Inserts marker and opens the Add Marker dialog box at the current cursor position.

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Command	Comments
Add region from selection	Creates a region from the current loop selection.
Crop project to selection	Crops all media items in the project to the current loop selection.
Insert empty space at selection	Inserts an empty space equal to the currently selected area into all tracks in the current project.
Remove contents of selection (moving later items)	Effectively deletes the currently selected area from the project, moving all later items up to fill the gap, whether or not ripple editing has been turned on.
Remove all markers from loop selection	Removes all markers from the currently selected area.
Paste	Pastes any previously cut or copied item into the currently selected track at the current cursor position.
Split items at cursor	Splits currently selected item or items at the current cursor position. If no item is selected, splits all items.
Split items at time selection	Splits currently selected item or items at the start and end of the current loop selection. If no item is selected, splits all items.
Select All	Selects all media items.
Copy selected area of selected items	Copies the selected area of selected items to the clipboard.
Copy loop of selected area of items	Copies the selected area as a loop.
Minutes : Seconds Measures – Beats (M:S secondary) Measures – Beats Seconds Samples Hours : Minutes : Seconds : Frames	Selects unit of measurement for ruler display.

22.6 The Big Clock Context Menu



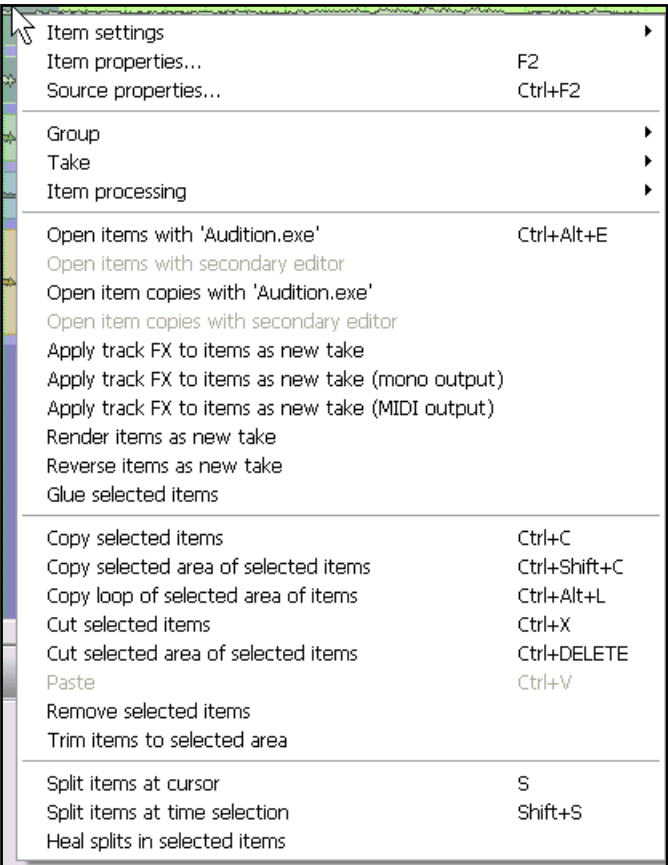
This menu is accessed by right-clicking over the Big Clock. Most of these options are self-explanatory.

Notice in particular:

- The option to automatically apply the same time units as those used on the ruler (above).
- The option to dock/undock the Big Clock in the Docker.

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22.7 The Media Items Context Menu



This menu is accessed by right-clicking over any media item.

If a number of media items have been selected, the command selected from this menu will be applied to all those items.

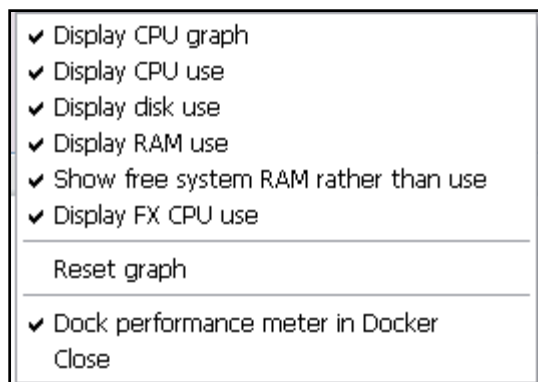
An explanation of this menu appears below.

Command	Comments
Item Settings	Opens a fly out menu of options for selected items or items, including Mute, Invert Phase, Play All Takes, Set Item Channel Mode, and Set Item Timebase.
Item Properties...	Opens Item Properties dialog box.
Source Properties...	Opens Source Properties dialog box.
Group	Opens Group fly out menu, to Group or Ungroup selected items,
Take	Opens Take fly out menu, with options including Next Take, Previous Take, Delete Active Take, Crop to Active Take, Explode All Takes to New Tracks, and Implode Selected Items to Takes.
Open items ...	This group of menu commands is used to open the selected item or items (or copies of these items) with the Wave Editor of your choice specified under Options, Preferences, External Editors.

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Command	Comments
Apply FX to items as new take	This group of commands allows you to process selected items as new takes, either stereo, mono or MIDI, as appropriate.
Reverse items as new take	Reverses selected media item or items as a new take.
Glue selected items	Joins selected media items into one.
Copy selected items Copy selected area of selected items Copy loop of selected area of items	This group of commands offers three options for copying the current selection to the clipboard.
Cut selected items Cut selected area of selected items	This group of commands offers two options for cutting the current selection to the clipboard.
Paste	Pastes content of the clipboards to the currently selected track at the current cursor position.
Remove selected items	Deletes selected media items and removes them from the project file.
Trim items to selected area	Trims media items to the currently selected area.
Split items at cursor	Splits currently selected items at current cursor position
Split items at time selection	Splits currently selected items at the start and end of the currently selected timeline area.
Heal splits in selected items	Removes splits and joins items as one again.

22.8 The Performance Meter Context Menu

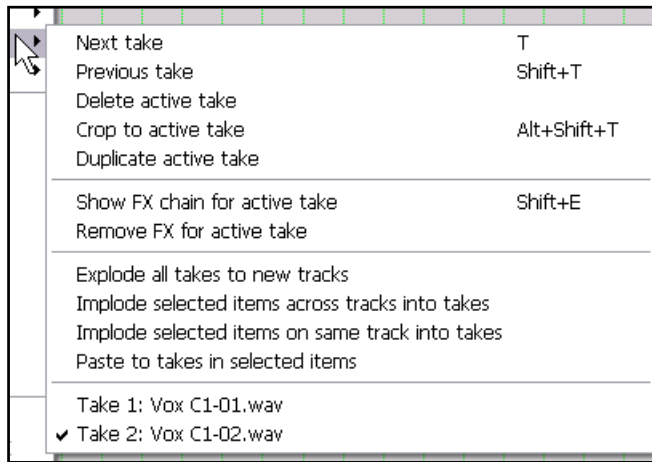


This context menu is displayed by right-clicking over any part of the Performance Meter window.

These commands are self-explanatory.

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22.9 The Take Context Menu



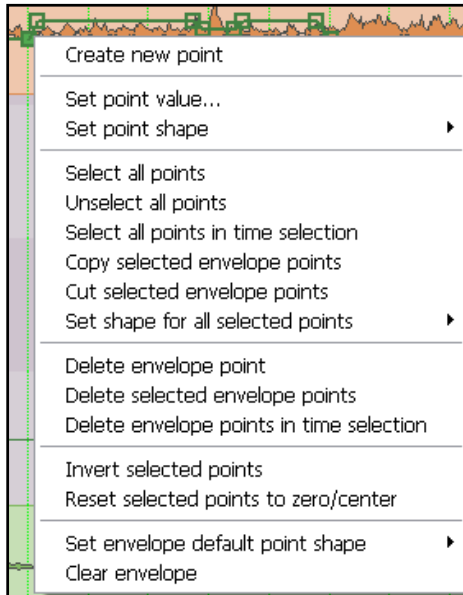
When a track consists of multiple takes, right clicking over a media item in that track and choosing **Take** from the context menu produces the sub menu shown on the left.

An explanation of these commands is shown in the table below.

Command	Comments
Next take	Causes the immediate next take to be selected.
Previous take	Causes the immediate previous take to be selected.
Delete active take	Causes the currently active (selected) take to be deleted.
Crop to active take	Crops all other takes for this item to the currently active take.
Duplicate active take	Creates a duplicate copy of the currently active take.
Show FX chain for active take	Opens any current FX chain that exists for the currently active take. If none exists, opens the Add FX browser for this take.
Remove FX for active take	Removes all FX from the take's FX chain.
Explode all takes as new tracks	Creates a new track for each take.
Implode selected items across tracks into takes	Creates a single track with one take for each media item selected, where the media items are selected across several tracks.
Implode selected items on same track into takes	Creates a single track with one take for each media item selected, where the media items are all selected from the same track.
Paste to takes in selected items	Pastes to takes in selected items.
Take 1: Take 2: Take 3: etc	Makes the selected take active.

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22.10 The Envelopes Context Menu



The envelope menu shown (left) is accessed by right-clicking over any point on any existing envelope.

Right clicking over an existing envelope but not on a specific point produces a similar menu, but with some point-specific commands such as **Set point value...** and **Set point shape** excluded.

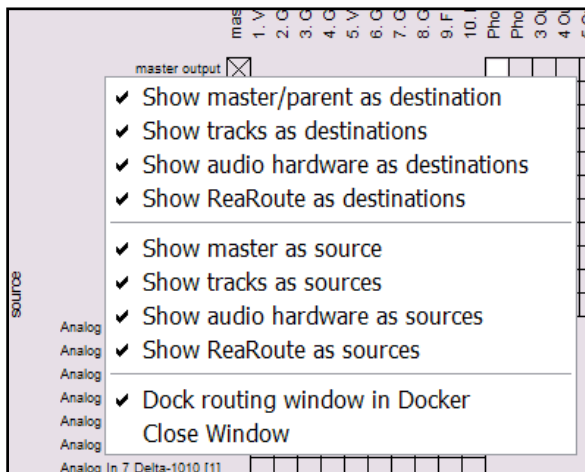
An explanation of this menu appears below.

Command	Comments
Create new point	Creates new point at the position where the mouse was clicked.
Set point value...	Opens a dialog box in which you can specify a different value for the specific point, and, if you wish, position and shape.
Set point shape	Lets you specify any of the five available shapes for the current point.
Select all points	Selects all points in the envelope.
Unselect all points	Unselects all points in the envelope.
Select all points in time selection	Selects all points on the envelope that are contained within the currently selected area along the timeline. Hold down Shift when right-clicking over the envelope to keep the selection for your next command (e.g. Copy selected envelope points).
Copy selected envelope points	Copies currently selected envelope point or points to the clipboard. Pressing Ctrl V causes them to be pasted onto whichever envelope is currently selected, starting at the cursor position.
Cut selected envelope points	Cuts currently selected envelope point or points to the clipboard. Pressing Ctrl V causes them to be pasted onto whichever envelope is currently selected, starting at the cursor position.

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Command	Comments
Set shape for all selected points	Allows you to select any one of the five available shapes to apply to all currently selected envelope points.
Delete envelope point	Deletes the envelope point.
Delete selected envelope points	Deletes all currently selected envelope points.
Delete envelope points in time selection	Deletes all points on current envelope that are contained within the currently selected area along the timeline.
Invert selected points	Causes currently selected envelope points to be inverted.
Reset selected envelope points to zero/center	Resets all currently selected envelope points effectively to a "neutral" value.
Set envelope default point shape	Selects the preferred shape to be applied to future new envelope points.
Clear envelope	Removes all points from the current envelope. You are prompted to confirm that you really want to do this before this change is applied.

22.11 The Routing Matrix Context Menu

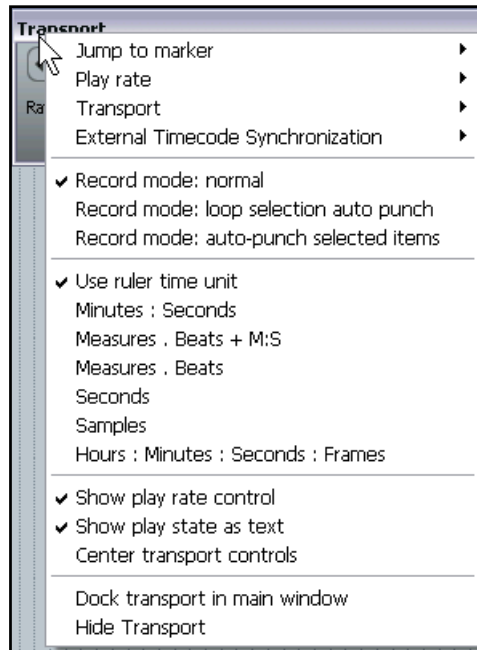


This context menu is accessed by right-clicking over any blank part of the Routing Matrix menu.

These commands are generally self-explanatory. Notice especially that if you have finished recording a project and wish to focus only on mixing, it is unlikely that you will need to select the option to **Show audio hardware as sources**.

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22.12 The Transport Bar Context Menu



This context menu is accessed by right-clicking over the Transport Bar.

An explanation of this menu appears below.

Command	Comments	
Jump to Marker	Displays a fly out menu of markers. Click on any marker in the list to jump to it.	
Play rate	Displays a fly out menu of options for adjusting the play rate. See illustration (right).	<div> Set to 1.0 Increase by ~6% (one semitone) Decrease by ~6% (one semitone) Increase by ~0.6% (ten cents) Decrease by ~0.6% (ten cents) Apply play rate to current BPM </div>
Transport	Displays a fly out menu of options to control the Transport. See illustration (right).	<div> Play Record Ctrl+R Pause Stop Play/pause Ctrl+Space Play/stop Enter Play (skipping loop selection) Alt+Space </div> <div> Go to start of project W Go to end of project End Toggle repeat R </div>
External Timecode Synchronization	Used to synchronize REAPER's clock to an external device.	<div> Synchronization enabled Synchronization settings... </div>
Record Mode	Sets the specified recording mode.	

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Command	Comments
Use Ruler Time Unit	Ensures that whatever time unit is selected for the ruler is also used on the Transport Bar. Alternatively, you can select one of the other options (see below).
Minutes : Seconds Minutes – Beats + M S Measures – Beats Seconds Samples Hours:Minutes:Seconds:Frames	Select your preferred unit of measurement for display on the Transport Bar.
Show play rate control	Toggles this option on and off.
Show play state as text	Toggles this option on and off.
Center Transport Controls	Toggles this option on and off.
Dock transport in Main Window	Toggles this option on and off.
Hide Transport	Hides the Transport Bar. To redisplay, press Ctrl Alt T .

22.13 The FX Window Context Menu

Add FX...	Insert, A
Add FX chain...	Shift+Insert, Shift+A
Save FX chain...	Ctrl+S
Save selected FX as chain...	
Copy selected FX	Ctrl+C
Cut selected FX	Ctrl+X
Copy all FX	Ctrl+Shift+C
Paste FX	Ctrl+V, Ctrl+Insert
Select all	Ctrl+A
Toggle selected FX bypass	Ctrl+B
Toggle selected FX offline	Ctrl+Alt+B
Rename FX instance	F2
Remove selected FX	Delete
Remove all FX	Shift+Delete
Save chain as default for new tracks	
Load default track chain	
Window float selected FX	(doubleclick)
Send all keyboard input to plug-in	
Build multichannel routing for output of selected FX...	
Build 16 channels of MIDI routing to this track	
Dock FX window in Docker	
Close FX window	

This menu is accessed by right-clicking within any track's FX window.

An explanation of this menu appears below.

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Command	Comments
Add FX ...	Opens Add FX Window to add one or more plug-ins to the current FX chain.
Add FX chain ...	Displays a menu of previously saved FX chains from which to select for insertion in the current FX window.
Save FX chain ...	Saves all FX in current FX window as an FX Chain.
Save selected FX as chain ...	Saves selected FX in current FX window as an FX Chain.
Copy selected FX	Copies currently selected FX to clipboard.
Cut selected FX	Cuts currently selected FX to clipboard.
Copy all FX	Copies all FX in current FX window to clipboard.
Paste FX	Pastes FX from clipboard into current FX window.
Select All	Selects all FX in current FX window.
Toggle selected bypass	Toggles bypass of all currently selected FX.
Toggle selected offline	Toggles online/offline status of all currently selected FX.
Rename FX Instance	Allows you to assign a specific name for this instance of the plug-in.
Remove selected FX	Removes all selected FX from current FX window.
Remove all FX	Removes all FX from current FX window.
Save chain as default for new tracks	Makes the FX chain in the current FX window the default FX chain automatically inserted when you create new tracks.
Load default track chain	Loads the current default FX chain into the currently open track FX window.
Window float selected FX	Floats selected FX so that they are displayed independently of the FX window.
Send all keyboard input to plug-in	Ensures that keystrokes (such as navigation keys) operate within the selected plug-in (where the plug-in has been designed to recognise and accept these keystrokes). Note that not all plug-ins will recognise these keystrokes.
Dock FX window in docker	Toggles the docked/undocked status of the FX window.
Close FX window	Closes the FX window.

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22.14 The Mixer Context Menu

✓ Show folders	
✓ Show normal top level tracks	
✓ Show tracks that are in folders	
✓ Show tracks that have receives	
Group folders to left	
Group tracks that have receives to left	
✓ Scroll view when tracks activated	
✓ Show multiple rows of tracks when size permits	
Show maximum rows even when tracks would fit in less rows	
✓ Show master controls on right	
✓ Show pan controls at top	
✓ Show FX inserts when size permits	
✓ Show sends when size permits	
Dock mixer in Docker	
Close	Ctrl+M

Right-clicking over the track number of any track in the Mixer window will cause the Track Pane menu to be displayed.

Right-clicking over any blank area of the mixer window, however, will cause the Mixer context menu (shown left) to be displayed.

[These options are explained in Section 11 of this User Guide](#) They mostly determine which tracks will and will not be displayed, and how the mixer will be laid out.

22.15 The MIDI Editor Context Menus

Export to new MIDI file...	
Undo "Close FX Chain Config"	Ctrl+Z
Can't Redo	Ctrl+Shift+Z
Copy events	Ctrl+C
Cut events	Ctrl+X
Paste	Ctrl+V
Select all events	Ctrl+A
Delete events	DELETE
Insert note at mouse cursor	INSERT
Insert note at edit cursor	I
Split events	S
Split event under mouse cursor	Shift+S
Reverse	
Quantize events...	Q
Quantize selected events using last settings	
Unquantize selected events	
Freeze quantization for selected events	
Remove selected duplicate notes	
Set selected note ends to start of next note	
Dock window	
✓ Sync editor transport to project transport	
✓ Preview notes on add/edit	
Single click inserts/removes notes	Alt+8
✓ Use F1-F12 as step sequencer	
✓ Show velocity handles on events	Alt+9
Show events as fixed length (drum mode)	Alt+7
✓ Show note names on events	Alt+0
✓ Show times relative to project	
✓ Mode: piano roll	Alt+1
Mode: named notes	Alt+2
Mode: event list	Alt+3
Close editor	

Right-clicking within the MIDI Editor will display one of two context menus, depending on where exactly you click.

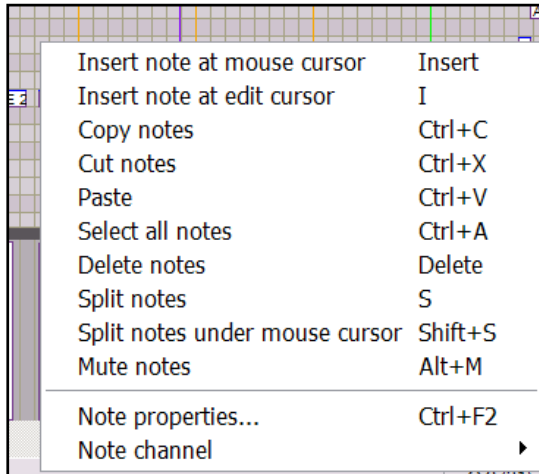
This context menu (left) is displayed when you right-click over the background of the MIDI Editor toolbar area.

An explanation of this menu follows below.

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Command	Comments
Export to new MIDI file ...	Exports contents of MIDI editor to new file.
Copy events	Copies selected events to the clipboard.
Cut events	Cuts selected events to the clipboard.
Paste	Pastes events from the clipboard.
Select all events	Selects all events.
Delete events	Deletes all selected events.
Insert note at mouse cursor	Inserts a note at the current mouse cursor position. This command should be used in conjunction with the Insert key.
Insert note at edit cursor	Inserts a note at the current edit cursor position.
Split events	Splits events.
Split event under mouse cursor	Splits any event under the mouse cursor.
Reverse	Reverses the media item currently being edited.
Quantize events ...	Opens the Quantize dialog box.
Quantize/Unquantize events Freeze quantization	Quantizes or unquantizes the selected events. Freezes quantization state for selected events.
Remove selected duplicate notes	Removes duplicate notes from current selection.
Dock window	Toggles docking/undocking the MIDI Editor window in the Docker.
Sync editor transport to project transport	Toggles this option on and off.
Preview notes on add/edit	Toggles this option on and off.
Single click inserts/removes notes	Toggles this option on and off.
Use F1 to F12 as step sequencer	Toggles this option on and off.
Show velocity handles on events	Toggles this option on and off.
Show note names on events	Toggles this option on and off.
Show times relative to project	Toggles this option on and off.
Mode: piano roll Mode: named notes Mode: event list	Selects one of the three MIDI Editor modes.
Close editor	Closes the MIDI Editor.

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Right-clicking over the actual MIDI editing area will cause the context menu shown on the left to be displayed.

Most of these commands should be self-explanatory.

Choosing **Note Properties...** will cause the Note properties dialog box to be displayed. Information contained here includes the Note itself, together with its Velocity, Position, Length and Channel.

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23 Optimizing Windows XP for REAPER

Important Note: *This section assumes that your PC is to be used exclusively (or primarily) as a Digital Audio Workstation and not (for example) for games, home office or email. The recommendations are for a stand alone system, not networked and with no Internet access.*

*These notes have been written to apply to **Windows XP** systems. Some settings and recommendations may also be applicable to systems using **Vista**, but this is not guaranteed. You are advised to check for yourself.*

23.1 Choosing a PC and PC Components

Topic	Comment
Operating System Version	The main differences between XP Home and XP Professional relate to their networking and connectivity capabilities. XP Home for most stand and DAWs is a simpler and less complicated choice.
Basic Hardware Requirements	Recommended: Multiple processors, at least 1 gig RAM, at least 1 gig free disk space, 16.7 million colours, 1280 by 1024 res, ASIO drivers. Minimum: 500 meg processors, 128 Meg RAM, at least 10 meg free disk space, 256 colours, 800 by 600 res, Windows compatible sound hardware.
Disks and Disk Management	Two physically separate hard drives are strongly recommended, both for improved performance and security of your data. Use your C: drive only for Programs, Installations and System files. Store all data and project files on your D: Drive.
Off Line Storage Media	The use of a device such as an external USB hard drive is strongly recommended for backing up and archiving data

23.2 System Performance Tweaks

Implementing the suggestions listed in this section will not transfer a slow, out of date computer into a state of art flier! But they may result in some improved performance at the margins, and might even help prevent the occasional disaster such as a crash.

The following table contains a list of suggestions of things that you may wish to do after installing Windows.

Topic	Comment
Optimizing for Performance	Windows allows you a large number of Visual Effects options that you don't need to use and that can compromise your PC's performance. Go to Control Panel , then double click on System and select the Advanced tab. Click the Settings button in the Performance section, then choose Adjust for best performance then click on OK .
Turn Direct Memory Access On	Direct Memory Access (DMA) should ensure the fastest means of enabling your data to be accessed from disk. To turn it on, follow these instructions. Go to Control Panel , then double click on System and select the Hardware tab. Click on the Device Manager button. Click on the + to the left of IDE ATA/ATAPI Controllers .

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Topic	Comment
	<p>Right click on Primary IDE Channel and choose Properties.</p> <p>Select the Advanced Settings tab.</p> <p>For both Device 0 and Device 1, choose DMA if available.</p> <p>Click on OK.</p> <p>Repeat this for the Secondary IDE Channel.</p> <p>If your system has more than one Primary and Secondary IDE Channel, you will need to do this for all of them.</p>
Set Processor Scheduling to Background Services	<p>This adjustment can make a significant difference to how low you can set your samples per buffer, and hence the latency that you can achieve for your soundcard.</p> <p>Open the Control Panel.</p> <p>Double-click on System and select the Advanced tab.</p> <p>Click on the Settings button in the Performance section, then click on the Advanced tab.</p> <p>Select Background Services, then OK and OK again.</p>
Turn Off Power Management	<p>The last thing you want to happen is for Windows to go into hibernation mode in the middle of a recording session!</p> <p>Right click over the Desktop.</p> <p>From the menu, choose Properties.</p> <p>Select the Screen Saver tab and click on the Power button.</p> <p>Display the Power Schemes drop down list and choose Always On.</p> <p>Set Turn Off Monitor, Turn off hard disks, and System Standby all to Never.</p> <p>Click OK then OK again.</p>
Use a Windows Classic Display Scheme	<p>Generally speaking, Windows Classic Display Schemes impose less of a CPU overhead than do XP schemes.</p> <p>Right click over the Desktop.</p> <p>From the menu, choose Properties.</p> <p>Display the Themes drop down list and choose Windows Classic.</p> <p>Go to the Desktop page, set Background to None and choose a plain colour pf your choice.</p> <p>Go to the Settings page and select Medium (16 bit) from the Color Quality drop down list.</p> <p>Click on OK.</p>
Turn Off Firewalls and Other Utilities	<p>The Windows XP Service Pack 2 Firewall uses a fair amount of system resources. If your DAW is stand-alone only (i.e., not networked and never connected to the Internet), you don't need it.</p> <p>Open the Control Panel and double click on Windows Firewall.</p> <p>Select the Off option then click on OK.</p>
System Restore: handle with care	<p>The Windows XP System Restore feature has its benefits in helping you to recover from a potential system disaster, but it comes at a price. Once the feature is turned on it runs automatically and you have little control over it. When it kicks in, it can make sufficient demands on your CPU to crash any other CPU intensive application that may be running at the</p>

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Topic	Comment
	<p>time.</p> <p>This can be avoided if you disable XO System Restore and instead use an application such as Acronis True Image to handle your disk imaging requirements.</p>
Turn Off Windows Sounds	<p>Windows sounds can interfere with your audio work.</p> <p>Go to the Control Panel and open Sounds and Audio Devices.</p> <p>Select the Sounds tab, display the drop down list of Schemes and choose None.</p> <p>Click on OK to close the dialog box.</p>
Turn Off Mapping through Soundcard	<p>If mapping is not disabled, some applications may still direct output through your pro soundcard.</p> <p>Open the Control Panel and double click on Sounds and Audio Devices.</p> <p>Select the Hardware tab, then select your pro standard sound card.</p> <p>Click on the Properties button then on the Properties tab.</p> <p>From the list that is then displayed, select your soundcard and click on Properties.</p> <p>Tick the option Do not map through this device.</p> <p>Click on OK, then OK again, then OK again.</p>
Use Defrag Often	<p>Defragmenting your hard drives regularly will ensure that your files (including your often large media files) are stored in a manner which aids their speedy retrieval. You should defrag your hard drives every two months or so.</p> <p>If you fail to do this, you will also run the risk of Windows performing various background activities such as prefetching which can compromise audio performance.</p> <p>The use of a third party defrag program such as O & O Defrag is recommended as these perform the task more efficiently than does Windows.</p> <p>However, if you need to use the Windows XP defrag utility, follow this sequence:</p> <p>Open the Control Panel.</p> <p>Double click on Administrative Tools.</p> <p>Double click on Computer Management.</p> <p>In the Computer Management pane (left), select Disk Defragmenter.</p> <p>Select a disk, then click on the Defragment button to defrag that disk.</p> <p>Repeat this step as often as necessary, once for each other disks.</p> <p>Close the Computer Management window when finished.</p>

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24 Troubleshooting REAPER

This section aims to help you resolve problems that are sometimes encountered by new users.

24.1 Input/Output Issues

Input Output Issues	
Problem	Diagnosis and Possible Solution
When I play back, my audio track is silent, even though there is activity in the track's VU meter.	<p>The problem is likely to be either with your routing in REAPER, your sound card's settings or with your audio hardware setup.</p> <p>REAPER's Routing:</p> <p>Make sure that the track's output is directed to the master.</p> <p>Make sure that the Master output is directed to the outputs on your sound card to which your speakers or headphones are attached.</p> <p>Sound Card Settings:</p> <p>Use the control software supplied with your soundcard to make sure that none of the following has occurred:</p> <ul style="list-style-type: none">• Output muted, or volume lowered too much.• Output patched to different hardware output. <p>Audio Hardware Setup:</p> <p>Make sure that the amplifier is connected to the same outputs on the soundcard as the output of the Master.</p> <p>Make sure that everything is connected to the power supply, switched on, and with appropriate volume levels.</p> <p>Use Windows Device Manager (Control Panel, System, Hardware, Device Manager, Sound Video and Game Controllers) to ensure the device is enabled and functioning correctly.</p> <p>Tips:</p> <p>Opening a different audio application and playing any wave file can help you determine whether the problem lies within REAPER or with your Sound Card or Audio Setup.</p>
I get an error message to the effect that MIDI device(s) cannot be opened	<p>The device may not be connected, or may be in use by another program.</p> <p>Check that the device is connected and supplied with power.</p> <p>Check whether another program has use of the MIDI device.</p> <p>Check that you have not accidentally opened REAPER twice.</p>
When I play back, my audio track is silent, and there is no activity in the track's VU meter.	<p>The problem is likely to be specifically related to that track or item, especially if you have other projects which do play correctly.</p> <p>Make sure that the track has not been muted.</p> <p>Make sure that the item has not been muted (right click over item, Item Properties).</p>

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Input Output Issues	
Problem	Diagnosis and Possible Solution
	<p>Check the FX Window for the track to make sure there is no FX which is causing the track to be silenced.</p> <p>Check the track's volume fader to make sure it is not set too low.</p>
When I play back, I don't hear some or all of a track's FX being applied	<p>The problem could be happening in the track's FX window or in the plug-in's own window, or both.</p> <p>Check that the track's FX Window has not been set to bypass mode.</p> <p>Check that the individual FX has not been set to bypass mode. This might occur in the FX Chain window or with some plug-ins within the plug-in's own window.</p> <p>Check that the plug-in's Wet/Dry mix setting (where present) has not been set to 100% dry.</p>
When I play back, I get clicks, pops, stutters or dropouts	<p>This probably means that you are attempting to play this project at a latency too low for your system. This is more likely to happen if you use a large number of CPU hungry FX such as Reverb. Try one or more of these remedies:</p> <p>Consider whether you can rearrange your mix to use fewer CPU intensive plug-ins, for example by making more use of FX busses to share FX used by more than one track.</p> <p>If you are using a high sample rate, such as 88200 or 176400, try a lower one. Go to File, Project Settings and reduce the Sample rate to 44100. This will reduce the load on the CPU and you will probably find that you can live with any perceived difference in sound quality.</p> <p>Consider increasing buffer size. This will increase latency, but should not be a problem when playing back. Go to Options, Preferences, Audio Device. Click on <i>ASIO Configuration</i> to bring up the Control Software for your sound card. Increase buffer size, perhaps to 1280 samples.</p> <p>Check your Audio Buffering preferences, especially for FX processing/multiprocessing. Be prepared to experiment with <i>Render ahead size</i> and with which options are allowed.</p>
When I play back, the Master clips into the red and distorts, even though the track level(s) appear quite low	<p>This can arise as a result of routing problems, for example when you have any track or tracks routed to the Master by several different routes at the same time.</p> <p>Check the Routing Matrix</p>
When I play back, the audio sounds clipped, even though it doesn't appear to be visibly clipping anywhere	<p>This could be caused by a routing problem, or by some FX or combination of FX which might be distorting your sound.</p> <p>Check the Routing Matrix to see if any track or tracks is/are being directly routed to the same audio hardware output as the Master. If this isn't the cause of the problem ...</p>

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Input Output Issues	
Problem	Diagnosis and Possible Solution
	<p>Disable all FX to see if this fixes the problem.</p> <p>If it does, reintroduce the FX gradually until you can identify which is causing the problem.</p>
When I try to play an imported MIDI track, it is silent	<p>This can be a routing, sound card or setup issue – see previous page. In addition it may be caused by a MIDI specific issue. This occurs when the track has not been assigned to a valid MIDI Output device or software synthesizer.</p> <p>If you are using a MIDI Hardware device, display the track's Routing Window and make sure it is assigned to a MIDI Hardware Device.</p> <p>If you are not using a MIDI Hardware device, display the FX Window for the track, and insert a software synthesizer of your choice (usually DXi or VSTi).</p>
When I try to record audio, nothing is recorded	<p>The problem here could lie either with your REAPER settings or with your hardware set up.</p> <p>Make sure the track is armed for recording.</p> <p>Make sure that the track has been assigned an input.</p> <p>Check (Options, Preferences, Audio Device) that your range of audio inputs has been defined <i>and enabled</i>.</p> <p>Make sure under the Options menu that you have the correct required Record Mode set (usually this should be Normal).</p> <p>Check that <i>Record Input</i> is enabled. Or, if you have selected <i>Record Output</i>, check the FX window for any FX that could be silencing the track's output.</p> <p>Make sure that the microphone or lead for the instrument being recorded is connected to the correct audio input.</p> <p>If the microphone requires phantom power, make sure that the phantom power supply is enabled.</p> <p>Check your audio input mixer (external hardware desk, sound card mixer software, or both) to make sure that the incoming signal is correctly routed.</p> <p>Check your audio input mixer (external hardware desk, sound card mixer software, or both) to make sure that the incoming signal is not muted.</p>
I don't have enough CPU to play back my project	<p>Almost certainly, this is because you are trying to use more FX than your DAW can handle.</p> <p>Use the Performance Meter to determine which tracks are using the most CPU hungry FX.</p> <p>Then right click over the media items for those tracks and either Apply FX to items as new take or Apply FX to items as new take (Mono).</p>

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24.2 REAPER Interface Issues

Interface Issues	
Problem	Diagnosis and Possible Solution
When I press Space (or some other Transport Control), nothing happens	<p>This happens when focus is with another window, such as the Routing Matrix, or an open Dialog Box. Two possible solutions are:</p> <ul style="list-style-type: none">Give focus to another view such as the Track View or Mixer before pressing the key, orUse an external MIDI control device such as a BCR2000 and assign transport functions to its various buttons. These will then work regardless of which window has focus, or whether a dialog box is open.
When I try to place the edit cursor exactly where I want it, it moves a little	<p>Snapping may be enabled. If so, use the Options, Enable Snapping command to disable it.</p>
When I try to make a time selection, the start and end points move from where I want them.	<p>Snapping may be enabled. If so, use the Options, Enable Snapping command to disable it.</p>
I add a Volume or Pan envelope to a track, but when I play back the fader does not move.	<p>Make sure that Automation Mode is set to Read and the envelope is armed.</p>
I record multiple takes on a track, but only the last one is visible.	<p>To view all takes for a track, choose the Options, Show All Takes in Lanes Command,</p> <p><i>or</i></p> <p>To view a take other than the last take, right click over the media item and choose the Take command from the context menu.</p>
When I maximize a track, the wrong track is displayed	<p>Check your <i>Vertical Zoom Behaviour</i> settings under Options, Preferences, Editing Behaviour. You probably want to set this to <i>Last Selected Track</i>.</p>
When I zoom in horizontally, the edit cursor disappears from view and I lose my place	<p>Check your <i>Horizontal Zoom Behaviour</i> settings under Options, Preferences, Editing Behaviour. You probably want to set this to <i>Edit Cursor or Play Cursor</i>.</p>
I try to view a window, such as Big Clock or Performance Meter, but I can't see it on the screen	<p>This can be tricky, and can sometimes happen because of changes made to your Windows display settings. There are two main ways to fix this.</p> <ul style="list-style-type: none">Use Windows Notepad to edit the reaper.ini file in the folder C:\Documents and Settings\User Name\AppData\REAPER. <p>This should only be attempted if you are confident that you understand what you are doing. For example, if the Big Clock has been lost, delete</p>

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Interface Issues	
Problem	Diagnosis and Possible Solution
	<p>only that section of the reaper.ini file, save it, close it, then restart REAPER.</p> <p>For example, in the reaper.ini file extract shown here, the Big Clock section is shown as italicized:</p> <pre>[flac encoder defaults] default_size=12 default=63616C66100000005000000AB [bigclock] wnd_vis=1 wnd_left=967 wnd_top=600 wnd_width=426 wnd_height=137 time_mode=0 [namecache] Analog_In_1_Delta_1010__1_=In 1</pre> <p>A safer option would be to simply rename this file as reaper.old or similar. This will return <i>all</i> preferences and options to their original default settings next time you run REAPER.</p>
My Undo History window is cluttered with every item and track selection I make	<p>Go to Options, Preferences, General and disable <i>Create Undo points for item/track selection</i>.</p>

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25 A Beginner's Glossary of REAPER and Other Audio Terms

Analog audio This is sound that is continuous, corresponding exactly to real sound. This is unlike digital sound, which is broken down into a series of ones and zeros. An analog signal is usually recorded using magnetic media such as tape. Cassette tapes and vinyl LPs for example both use analog sound. Analog recordings cannot be copied without some loss of sound quality, and are likely to contain more unwanted noise than digital recordings.

ASIO Audio Stream Input-Output. This is an audio protocol originally developed by the Steinberg company and used by REAPER to communicate with audio hardware devices and interfaces (such as PCI Soundcards, Firewire and USB devices).

Bit Depth (Sample Size) The bit depth is the level of detail at which a computer samples analog audio to create digital audio. When recording wave files, most commonly, you use 16 or 24 bit sampling. 24 bit audio is generally preferred because it gives a more accurate representation of the sound and makes it easier to avoid clipping, but it does take up more disk space. Bit depth should not be confused with sampling rate.

Bit Rate This measures the number of kilobits per second of data in MP3 and other audio files. The bit rate you choose when creating an MP3 file determines the size and quality of the resulting MP3. The highest commonly used bit rate is 320 kbps. A file created using this bit rate will have excellent quality, but will be fairly large. A standard bit rate for encoding MP3s is 128 kbps. A file created using this bit rate will have good quality, and take up about 1 Mb per 1 minute of sound.

Buffer An audio buffer is a driver setting that helps determine the rate at which audio passes between your computer's processor and its sound card. Reducing the buffer size can help reduce the amount of latency while recording and monitoring audio. Increasing the buffer size can help prevent pops and clicks while recording.

Burn This is the process of writing data or files onto a recordable CD using a hardware device called a CD Burner. Generally, you create either an audio or a data disk when you burn a CD (although hybrid formats like CD Extra are also available). Audio disks can be played in any standard audio CD player. A

data disk contains computer files and can only be read on computers. REAPER supports the burning of audio disks.

Bus An internal pathway that may form part of your audio routing system. Although REAPER makes no inherent distinction between a track and a bus, a track can be considered to be functioning as a bus when more than one other track has been routed to it.

Channel A channel is a path through which an audio signal flows. One important feature of REAPER is its ability to use up to 64 separate channels with any single track or tracks.

Chorus An effect that makes one voice or instrument sound like many. Chorus works with all types of audio, but is particularly effective with the human voice.

Clipping This is the unpleasant distortion that you hear when output is too loud, causing the peaks of the audio signal to rise above the capabilities of the amplifier circuit. To avoid distortion, reduce the volume or gain before the stage in which the clipping occurs.

CODEC (or Codec) Codec stands for compression / decompression. A codec is a program used to enable Windows to compress and/or decompress audio to and from different formats. For example, REAPER uses the LAME codec for creating MP3 files.

Compression (Audio) A process of reducing the dynamic range of an audio stream. Often used to make the loud parts of a track quieter and the quiet parts louder. Not to be confused with data compression, which is an entirely separate and unrelated topic.

Compression (Data) The process of packing digital data, such as computer files, more efficiently for the purpose of storage or transmission. MP3 is one example of a commonly used compressed audio format. Not to be confused with audio compression, which is an entirely separate and unrelated topic.

Decibel A unit used for the measurement of sound. Commonly, Sound Pressure Levels (SPL) are represented as numbers from 0dB (the softest sound

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that may be heard) to 120dB and beyond (the level at which sound is perceived as pain).

Delay An effect which creates a delayed sound

Digital Audio Digital audio is audio that has been converted into a series of ones and zeros that can be processed by a computer. When analog sound is converted in this way, it is commonly saved and stored as a wave file. Digital sound is easier to reproduce and manipulate without loss in quality than analog.

Digital Audio Workstation (DAW) A term used to describe a computer when it has been set up and equipped with the necessary software and hardware to function as a recording studio.

DirectX A widely used plug-in format, generally less popular than VST.

Docker The REAPER Docker provides a tabbed viewing area for several REAPER functions (mixer, FX browser, undo, routing matrix, etc.) and is accessible through the View menu. The Docker can be detached from the main REAPER window and moved, for example, to a secondary monitor.

Driver Software that works with your computer's operating system to control and use a particular piece of hardware such as your sound card. To enable it to function at its best you should check the web regularly for any updated drivers for your soundcard.

Dry A term used to describe an audio signal to which no effects have been added. The opposite is wet.

Encoding / Decoding The process of converting audio to or from a compressed format like MP3 or FLAC. The encoding and decoding processes requires the use of CODECs.

Envelope A technique used to control how any of a number of a track's attributes behaves over time. For example, an envelope can be used to automatically fade a track's volume up and down as required for different parts of a song whenever it is played back.

Equalization (EQ) Sound is made up of many vibrations which take place at the same time at different frequencies. An audio equalizer lets you separately adjust the volume of different ranges of frequencies, thus changing the make up of the overall

sound. Frequency is measured in hertz (Hz). The higher the number, the higher-the pitch of the sound.

Fade A technique to bring sound into or out of a track gradually. Fade-in brings the sound in gradually, fade-out does the opposite. Cross fade occurs when two media items overlap in such a way that one is faded in while the other is faded out.

Fader A device which enables you to control the level of an audio signal by sliding up or down. Examples of the use of faders in REAPER are to control a track's volume and panning.

Flange This is an audio effect that distorts sound by applying both a short delay and variable modulation of the frequency.

Folder A folder is a collection of related tracks, and serves as a simple and convenient means of controlling all of the tracks contained within it. For example, changes can be made to the volume level of a folder to affect the combined volume of all of the tracks contained within that folder. Changes made to the volume level of individual tracks within a folder will affect the volume of that track, and the relative balance between all tracks in the folder.

Frequency The number of vibrations in a sound wave per unit of time. Frequency is usually measured in hertz, where one hertz is one cycle per second. High-pitched sounds have higher frequencies and low-pitched sounds have lower frequencies.

Glue To glue a track causes REAPER to render the selected items to a new single WAV file, which replaces the original items.

High Pass Filter A high pass filter removes all sound below a set frequency. It can be useful in removing certain kinds of rumble and hum.

Input Monitoring The process of having the audio stream that is being recorded being also fed directly back to the musician or singer through their headphones. If latency is too high, a perceived delay or echo effect will be noticeable.

Items Items (aka "Media Items" or "Media Events") contain audio/MIDI information and reside in a Track. Items can be empty, or have one or more "Takes", one of which is visible and "active". Items are often called 'Parts' in other DAW software.

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Latency Latency is a measurement of the time taken for audio to travel from the sound card, through REAPER, and out again to your headphones or speakers. Usually measured in milliseconds. For input monitoring, a latency of less than 5 ms is usually preferred.

Level The amount of power that drives an audio signal. Common names given to varying levels of voltage (from lowest to highest) are microphone level, instrument level and line level.

Low Pass Filter A low pass filter removes all sound above a set frequency. It is useful in removing certain kinds of hiss.

Markers Markers, like Regions, are used to identify important sections of a song (i.e. Verse, Chorus, Intro, etc.) Unlike Regions, Markers indicate only the beginning point of a section and are displayed in the Markers band of the Timeline. Markers are useful for quickly locating and playing a section.

Master The section of REAPER's mixer where the main mix is controlled.

Media Item A media item is an audio or MIDI recording. In many DAWs these are known as *clips*.

MIDI (Musical Instruments Digital Interface) A system that uses a synthesizer to enable your computer to play back music under program control. MIDI instructions can include which notes to play and which instrument to simulate. MIDI can also be used to enable a computer to control external MIDI-compliant instruments such as synthesizers.

Mixer View REAPER's Mixer View depicts a virtual representation of a traditional hardware mixing desk. This can be used to combine all of the signals from your various audio and MIDI tracks into a Main Mix, usually consisting of one single stereo paired output.

MP3 MPEG audio layer 3. A compressed audio format widely used to transfer music over the internet. An MP3 file is much smaller than a wave file, but still sounds to most people's ears virtually as good as the original.

Noise Gate A noise gate is a filter that detects sound levels in an audio stream and shuts out sound when the volume falls below a determined level. It can be useful, for example, to cut out unwanted background noise that may be present during an otherwise silent passage on a recording.

Normalization This effect permanently adjusts the amplitude (volume, essentially) of audio to a certain value. Normalization is particularly useful when creating a CD using various different tracks. Normalization can be used to help obtain a consistent level of volume for the different tracks.

Notch Filter This filter removes all audio in a specified frequency band in a wave file.

OGG Vorbis OGG Vorbis is a free, open-source audio compression format. Though less widely used than MP3, it can provide greater fidelity.

Pan A control that lets you determine the relative left-right balance of a mono signal within the stereo spectrum.

Plug-in A small program used in conjunction with REAPER to enable you to manipulate the sound of recorded tracks. Functions carried out by plug-ins include EQ, delay and chorus. Two widely used plug-in formats are DirectX and VST (Virtual Studio).

Real-time Refers to effects that take place as you listen, without a noticeable delay.

Receive The method by which audio sent from one track is accepted by its destination track or bus.

Regions Regions, like Markers, are used to identify important sections of a song (i.e. Verse, Chorus, Intro, etc.) Unlike Markers, Regions indicate both the beginning and ending points of a section and are displayed in the Regions band of the Timeline. Regions are useful for relocating/duplicating existing sections of a song.

Reverb An effect that simulates natural reverberations (sound reflections) that occur in different rooms and environments to create an ambience or sense of space.

Reverse An effect that takes one or both channels in a sound file and plays them backwards.

Rip To extract music directly from your CD in pure digital form and save it directly to your hard drive.

Routing A term used to describe the path, or paths, taken by an audio stream which on playback takes it from the track on which it has been recorded all the way to its position in the final mix.

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Routing Matrix REAPER's overview of a project's entire routing network. Changes to routing can also be made in the Routing Matrix.

Sampler A hardware device or software application that uses samples to generate audio output. Samplers often use a number of samples together to create realistic sounding reproductions of real sounds and musical instruments.

Sampling Rate The sampling rate is a measurement of how many times a second your audio recording software captures the incoming audio signal. Commonly used sampling rates are 44.1 kHz, 48 kHz, 88.2 kHz and 96 kHz. For example, at 44.1 kHz, incoming audio is sampled 44,100 times per second. The higher the sampling rate, the more disk storage required. If you're not sure, try recording initially with a sampling rate of 44.1 and see if you are satisfied with the results.

Send The method by which audio is routed from one track to another track or bus, where it is accepted via a *Receive*.

Stems Stems are a group of selected tracks and/or folders. They allow you to render selected tracks to disk at the same time (or in lieu of) the main mix. You can use stems to "freeze" fx on tracks, or to render each track in a mix (a "stem" as it is called) so that a mastering engineer (or whoever) can later on adjust the mix.

Synthesizer A hardware or software device that artificially (using oscillators) generates signals to simulate the sounds of real instruments or to create other sounds not possible with real instruments.

Takes A take is a part of an item which contains a media source (audio, MIDI, or other type). An item can have multiple takes, which may refer to different recorded versions (where it gets its name). When you adjust an item (splitting, adjusting its start/end times, stretching, etc), the action is performed on all takes, so that if you need to switch to a different take, the overall timing is correct.

Tracks A REAPER project is made up of any number of Tracks that you record (or import). Tracks can contain multiple media items and envelopes. Tracks appear as horizontal bars on the Timeline and as vertical bars on the Mixer. REAPER offers 3 types of tracks. 1. Standard Tracks: Standard tracks hold items and envelopes. 2. Folders: Folders hold items, envelopes, and standard tracks. 3. Stems: Stems include selected standard tracks/folders.

Track Control Panel (TCP) The area (to the left of the REAPER screen in Track View) where a project's various tracks are listed. So called because it is used to control the various track attributes, such as to arm for recording, or to control volume on playback.

VST A widely used plug-in format, Virtual Studio, developed originally by Steinberg.

Wave (.wav) Files A wave file is an uncompressed audio file on your PC. This enables it to be as close a copy to the original analog data as is possible.

Waveform A visual representation of a wave file.

Wave Editor Audio software designed for editing digital audio.

Wet A term used to describe an audio signal to which effects have been added. The opposite is dry.

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