



# **HIERO and HIEROPLAYER**

**USER GUIDE  
VERSION 1.7v1**

---

Hiero™ and HieroPlayer™ User Guide. Copyright © 2013 The Foundry Visionmongers Ltd. All Rights Reserved. Use of this User Guide and the Hiero software is subject to an End User Licensing Agreement (the “EULA”), the terms of which are incorporated herein by reference. This User Guide and the Hiero software may be used or copied only in accordance with the terms of the EULA. This User Guide, the Hiero software and all intellectual property rights relating thereto are and shall remain the sole property of The Foundry Visionmongers Ltd. (“The Foundry”) and/or The Foundry’s licensors.

The EULA is available in the appendices.

The Foundry assumes no responsibility or liability for any errors or inaccuracies that may appear in this User Guide and this User Guide is subject to change without notice. The content of this User Guide is furnished for informational use only.

Except as permitted by the EULA, no part of this User Guide may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, recording or otherwise, without the prior written permission of The Foundry. To the extent that the EULA authorises the making of copies of this User Guide, such copies shall be reproduced with all copyright, trademark and other proprietary rights notices included herein. The EULA expressly prohibits any action that could adversely affect the property rights of The Foundry and/or The Foundry’s licensors, including, but not limited to, the removal of the following (or any other copyright, trademark or other proprietary rights notice included herein):

Hiero™ and HieroPlayer™ shot management and conform software © 2013 The Foundry Visionmongers Ltd. All Rights Reserved.

Hiero™ and HieroPlayer™ are trademarks of The Foundry Visionmongers Ltd.

Mac, Mac OS, Final Cut Pro and QuickTime are trademarks of Apple, Inc., registered in the U.S. and other countries.

Linux ® is a registered trademark of Linus Torvalds.

Windows ® is the registered trademark of Microsoft Corporation.

RED, RED-ONE, R3D, EPIC, HDRx, and RMD are trademarks of Red.com, Inc.

In addition to those names set forth on this page, the names of other actual companies and products mentioned in this User Guide (including, but not limited to, those set forth below) may be the trademarks or service marks, or registered trademarks or service marks, of their respective owners in the United States and/or other countries. No association with any company or product is intended or inferred by the mention of its name in this User Guide.

Adobe ® and After Effects ® are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Avid ®, Avid DNxHD ®, and Media Composer™ are either registered trademarks or trademarks of Avid Technology, Inc. or its subsidiaries in the United States and/or other countries.

Hiero and HieroPlayer software design and engineering: Matt Brealey, Adam Cherbetji, Rick Coles, Jon Creighton, Vincent Delannoy, Paul Dunnill, Martiño Figueroa, Michael Hughes, Jerry Huxtable, David Jennings, Michael Jones, Juan Leni, Zulfiqar Malik, Matthew Mauger, Dan Milburn, Antón Morant Fernández, Ant Nascè, Bruno Nicoletti, Matt Plec, Przemek Stys, and Dylan Yudaken.

Product testing: Dan Allum, Nikolas Almpanis, Konrad Korzel, Natasha Sandars, Zachary Quinn Scheuren, and Piotr Trzesicki.

Writing and layout design: Joel Byrne.

Proof reading: Eija Närvänen.

The Foundry  
6th Floor, The Communications Building  
48 Leicester Square, London  
WC2H 7LT  
UK

Rev: April 4, 2013

# Contents

<b>PREFACE</b>	Key Features . . . . .	7
	About this Guide . . . . .	7
	Getting Help . . . . .	8
	Online Help . . . . .	8
	Customer Support . . . . .	8
<b>INSTALLATION AND LICENSING</b>	System Requirements . . . . .	9
	Operating System . . . . .	9
	Hardware . . . . .	9
	Installing Hiero or HieroPlayer . . . . .	10
	Launching Hiero or HieroPlayer . . . . .	11
	Startup Options . . . . .	12
	Licensing Hiero and HieroPlayer . . . . .	13
	Licensing Hiero on a Single Machine . . . . .	14
	Licensing Hiero or HieroPlayer Over a Network . . . . .	15
Further Reading . . . . .	17	
<b>HIERO AND HIEROPLAYER WORKFLOW</b>	Feature Comparison . . . . .	18
	Collaborative Project Case Study . . . . .	20
	Preparing a Project in Hiero . . . . .	20
	Loading a Hiero Project in HieroPlayer . . . . .	21
	Hero Seat Case Study . . . . .	23
	Element Library Case Study . . . . .	24
<b>CUSTOMISING YOUR WORKSPACE</b>	Workspace Overview . . . . .	25
	Menu Bar Components . . . . .	27
	Creating Your Own Workspace . . . . .	28
	Saving Workspaces . . . . .	31
	Loading Workspaces . . . . .	32
	Deleting Workspaces . . . . .	32
	Workspace Preferences . . . . .	33
	Optimising Read and Decode Performance . . . . .	42
Using Helper Threads . . . . .	43	
<b>INGESTING MEDIA</b>	About Clips . . . . .	44
	Ingesting Media . . . . .	46
	Using Drag-and-Drop . . . . .	47
	Using the File Browser . . . . .	48
	Reconnecting and Refreshing Clips . . . . .	49

---

	Caching Media Locally . . . . .	50
<b>USING THE VIEWER</b>	Viewer Tools . . . . .	54
	Playback Tools . . . . .	57
	Caching Frames in the Playback Cache . . . . .	59
	Using In and Out Markers . . . . .	60
	Using the Media Tab . . . . .	62
	Working with Colourspaces . . . . .	63
	Previewing on a Broadcast Monitor . . . . .	65
	Using Scopes . . . . .	66
	Histogram . . . . .	66
	Waveform . . . . .	67
	Vectorscopes . . . . .	69
	About Anamorphic Media . . . . .	69
	About RED Media . . . . .	70
	Using RMD Look Files . . . . .	71
	Synching to VBlank . . . . .	72
<b>USING TAGS</b>	Using Quick Tags . . . . .	73
	Tagging Using the Viewer . . . . .	74
	Tagging Track Items . . . . .	75
	Adding Notes to Tags . . . . .	76
	Filtering and Flagging Media Using Tags . . . . .	77
	Creating Custom Tags . . . . .	78
	Removing Tags . . . . .	79
<b>VIEWING METADATA</b>	Filtering and Flagging Media Using Metadata . . . . .	80
<b>CONFORMING USING HIERO</b>	Project Settings . . . . .	82
	Importing Sequences . . . . .	84
	Conforming Sequences . . . . .	86
	Conforming Using the Browser . . . . .	87
	Conforming with Pre-ingested Media . . . . .	89
	About the Media Spreadsheet . . . . .	90
	Adjusting Timecodes . . . . .	92
	Renaming Shots on the Timeline . . . . .	94
	Saving and Loading Projects . . . . .	95
	Autosaved Projects . . . . .	97
<b>MANAGING TIMELINES</b>	Adding Tracks to the Timeline . . . . .	100
	Adding Clips to the Timeline . . . . .	103
	Audio and the Timeline . . . . .	105

---

WAV Track Items . . . . .	106
Synchronising Audio and Video . . . . .	107
Using Reference Media . . . . .	108
Comparing Media . . . . .	108
Viewing Multi-Format Timelines . . . . .	110
Refreshing and Replacing Track Items . . . . .	112
Timeline Editing Tools . . . . .	113
Using the Multi Tool . . . . .	114
Move/Trim Tool . . . . .	115
Selection Tools . . . . .	120
Slip Clip Tool . . . . .	122
Slide Clip Tool . . . . .	125
Roll Edit Tool . . . . .	127
Retime Clip Tool . . . . .	128
Razor and Join Tools . . . . .	129
Setting Soft Trims . . . . .	132
Enabling and Disabling Track Items . . . . .	133
Adding Transitions . . . . .	134
Invalid Transitions . . . . .	136
Retiming Clips . . . . .	136
Using Freeze Frames . . . . .	139
<b>VERSIONS AND SNAPSHOTS</b>	
Using Versions . . . . .	141
Versions in Bins . . . . .	142
Versions in Sequences . . . . .	144
Using Snapshots . . . . .	144
Creating Snapshots . . . . .	145
Restoring Snapshots . . . . .	146
<b>ROUND-TRIPPING AND EXPORT MANAGEMENT</b>	
Round-Tripping Using the Export Dialog . . . . .	148
Introduction to the Export Dialog . . . . .	148
Using the Shot Template . . . . .	150
Adding Burn-in Text to Exports . . . . .	155
Adding Additional Nuke Nodes During Export . . . . .	156
Exporting to Nuke . . . . .	158
Building VFX Tracks . . . . .	163
Round-Tripping Using Hiero<>Nuke . . . . .	167
Connecting Hiero<>Nuke . . . . .	168
Using Hiero<>Nuke in HieroPlayer . . . . .	171
Advanced Send to Nuke . . . . .	173
About 3:2 Pulldown . . . . .	173
Transcoding . . . . .	176
Transcoding a Sequence or Shots . . . . .	176

---

	Transcoding from the Bin View. . . . .	180
	Transcoding Timeline Selections. . . . .	181
	Ad Hoc Exports. . . . .	181
	Exporting EDLs and XMLs. . . . .	181
	Using the Copy Exporter. . . . .	183
<b>CUSTOMISING HIERO AND HIEROPLAYER</b>	Environment Variables . . . . .	185
	Setting Environment Variables . . . . .	185
	Sharing Presets. . . . .	187
	Startup Projects . . . . .	187
	Using the Python API . . . . .	188
	Running Python During Startup . . . . .	188
	Using the Script Editor . . . . .	190
<b>APPENDIX A</b>	Hiero and HieroPlayer Hotkeys . . . . .	193
<b>APPENDIX B</b>	Supported Image Formats. . . . .	200
	Optimised Formats and Limitations . . . . .	201
	Supported Audio Formats. . . . .	202
<b>APPENDIX C</b>	Third Party Licences . . . . .	203
<b>APPENDIX D</b>	End User License Agreement (EULA). . . . .	221

# 1 PREFACE

Hiero, in conjunction with HieroPlayer, is designed to provide shot management, conform, and playback capabilities for people creating visual effects, especially those using The Foundry's Nuke Compositor. Hiero combines well with Nuke to deliver visual effects sequences without resorting to other third party applications.

For post-production houses creating visual effects in a collaborative manner, the easy round-tripping of clips and track items to and from Nuke frees expensive "hero" seats that are currently being used as conform, review, and project management stations, allowing for more efficient use of staff and resources in those facilities.

## Key Features

- Conform multi-track timelines from CMX 3600 Edit Decision Lists (EDLs) and Final Cut Pro XML, including cuts, transitions and retimes.
- Soft import any image sequence type supported by Nuke, meaning the media is not copied multiple times saving disk space. In addition, Hiero and HieroPlayer can also ingest audio and multi-channel images.
- Playback sequences and clips in realtime (dependent on hardware).
- Version and snapshot clips and sequences to record progress and manage your creative options.
- Round-trip through Nuke or export general purpose shots using soft exports in most cases—no bakes are required.
- Use Hiero<>Nuke to set up a connection between the two applications, updating clips on-the-fly.
- Accomplish most tasks through Python scripting that you can with the Hiero and HieroPlayer user interfaces.

## About this Guide

Throughout this User Guide, we assume you have a basic knowledge of video and audio theory, as well as proficiency with the operating system on which Hiero is installed.

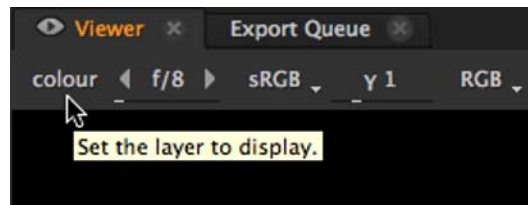
For the most up-to-date information, please see the Hiero product page and the latest User Guide on our web site at [www.thefoundry.co.uk](http://www.thefoundry.co.uk).

## Getting Help

If you can't find what you need in this document, there are other sources of help available to you for all aspects of Hiero and its operation.

## Online Help

Most controls offer concise instructions in the form of tooltips. To display the tooltips, hover your mouse pointer over an interface control or parameter.



Hiero's **Help** menu includes links to the latest Release Notes and Nukepedia, the online knowledge base maintained by experienced Nuke users, containing downloads, tutorials, interviews and more.

There is also a Hiero user forum at [forums.thefoundry.co.uk](http://forums.thefoundry.co.uk), set up as a hub for users to ask questions and share information about Hiero.

## Customer Support

Should questions arise that this manual or the online help system fails to address, you can contact Customer Support directly by email at [support@thefoundry.co.uk](mailto:support@thefoundry.co.uk) or telephone to our London office on +44 (0)20 7968 6828 or to our Los Angeles office on (310) 399 4555 during office hours.

## 2 INSTALLATION AND LICENSING

Installing and licensing new applications can be a boring task that you just want to be done with as soon as possible. To help you with that, this chapter guides you to the point where you have a default workspace in front of you and are ready to start viewing and editing your media with the minimum of effort.

### System Requirements

Before you do anything else, ensure that whichever platform you intend to run the application on meets the following minimum requirements.

#### Operating System

##### Mac OS X

- Mac OS X Snow Leopard 10.6.8 or above

##### Linux

- Linux RHEL 5.4 64-bit or above

##### Windows

- Windows 7 64-bit, or above, with the latest version of QuickTime installed

#### Hardware

- 4 GB of disk space available for caching and temporary files
- 8 GB of RAM (minimum requirement)
- Intel i3 CPU (or equivalent)
- Workstation-class graphics card with OpenGL 2.1 driver support, such as NVIDIA Quadro series or ATI FireGL series



**NOTE:** Hiero and HieroPlayer do not support the NVIDIA Quadro 4500 FX and GeForce 7300 GT graphics cards.

- RED Rocket cards with at least Rocket Driver 1.4.19.0 and Firmware 1.1.16.5 or later



**NOTE:** RED Rocket cards may not work as expected without the latest drivers and firmware.

- The following monitor out cards are currently supported in Hiero (not HieroPlayer), though other combinations of cards and drivers may work:
  - AJA Kona series PCI cards and Io XT (Mac only, requires Thunderbolt port)
  - Blackmagic DeckLink series PCI cards, UltraStudio Express and 3D (Mac only, requires Thunderbolt port)



**NOTE:** AJA monitor out cards are not currently supported on Linux.



**NOTE:** On Mac, the AJA Kona 3G is only supported on OS X Lion.



**NOTE:** Monitor out on Windows machines with AMD graphics cards is not currently supported.

## Installing Hiero or HieroPlayer

Download the required application from [www.thefoundry.co.uk/products/](http://www.thefoundry.co.uk/products/) by choosing the required platform from the list. For example, if you intend to install Hiero on Mac OS X, download the Hiero **.dmg** file.

Follow the on-screen instructions to download the correct installer.

### Mac OS X

1. Double-click on the **.dmg** archive to extract the installation package.
2. Double-click on the **.pkg** file.
3. Follow the on-screen instructions to install the application. By default, Hiero is installed to **/Applications/Hiero1.7v1** and HieroPlayer to **/Applications/HieroPlayer1.7v1**

### Linux

1. Extract the application from the **.run** archive with the following terminal command:

```
sudo ./Hiero1.7v1-linux-x86-release-64.run
```

OR

```
sudo ./HieroPlayer1.7v1-linux-x86-release-64.run
```

The installer displays the End User Licensing Agreement (EULA) and prompts you to accept it.

2. If you agree with the EULA, enter **y** and press **Enter** to accept the EULA. (If you don't agree with the EULA and press **n** instead, the installation is cancelled.)

The selected application is installed in an appropriately named folder in the current working directory.



**NOTE:** If you leave out **sudo** from the terminal command, you need to ensure that you have sufficient permissions to install the application under your current working directory.

After the application files have been installed, the installer also runs a post-installation script that creates the following directory:

```
/usr/local/foundry/RLM
```

If you don't have sufficient permissions on the **/usr/local** folder for this directory to be created, the post-installation script prompts you for your **sudo** password as necessary.

## Windows



**NOTE:** Ensure that the latest version of QuickTime is installed **before** installing the application. See <http://www.apple.com/quicktime/download/> for more information.

1. Double-click on the Hiero **.exe** file.
2. Follow the on-screen instructions to install the required application. By default, Hiero is installed to **<drive letter>/Program Files/Hiero1.7v1** and HieroPlayer to **<drive letter>/Program Files/HieroPlayer1.7v1**

## Launching Hiero or HieroPlayer

Launch Hiero using one of the following methods, depending on which platform you're using.

### Mac OS X

- Click the dock icon.
- Using the Finder, open the application directory (by default, **/Applications/Hiero1.7v1/** or **/Applications/HieroPlayer1.7v1/**) and double-click the **.app** icon (or list item).
- Open a terminal and enter the following command:  

```
/Applications/Hiero1.7v1/Hiero1.7v1.app/Hiero1.7v1
```

OR

```
/Applications/HieroPlayer1.7v1/HieroPlayer1.7v1.app/HieroPlayer1.7v1
```

**Linux**

- Open the `~/Hiero 1.7v1/bin` or `~/HieroPlayer 1.7v1/bin` directory and double-click the icon (or list item).
- Open a terminal, navigate to the `~/Hiero 1.7v1/bin` or `~/HieroPlayer 1.7v1/bin` directory and enter `./Hiero 1.7v1` or `~/HieroPlayer 1.7v1/`.



**NOTE:** The `~/` in the filepath indicates the directory from which the installer was executed.

**Windows**

- Double-click the icon on the Desktop.
- Navigate to **Start > All Programs > The Foundry > Hiero 1.7v1** or **HieroPlayer 1.7v1**.
- Using a command prompt, navigate to the application directory (by default, `\Program Files\Hiero 1.7v1` or `\Program Files (x86)\Hiero 1.7v1` for Hiero and `\Program Files\HieroPlayer 1.7v1` or `\Program Files (x86)\HieroPlayer 1.7v1` for HieroPlayer), and enter `Hiero 1.7v1` or `HieroPlayer 1.7v1`.

**Startup Options**

If you choose to launch the application from a command line, you can append arguments to the command as follows:

Argument	Result
<code>--help (-h)</code>	Displays the available arguments with examples.
<code>--version</code>	Displays version and copyright information.
<code>--script</code>	Passes all arguments and options after <code>--script</code> into the application. For example:  <code>./Hiero1.7v1 --script myscript.py</code> If the script resides in a different directory to the application, specify the filepath as well.
<code>--player (Hiero only)</code>	Launches Hiero in HieroPlayer mode.
<code>--log-file</code>	Sets the location of any logfiles created. For example:  <code>./Hiero1.7v1 --log-file /Desktop/log.txt</code> See <a href="#">Setting Environment Variables</a> to specify the logfile using an environment variable.

Argument	Result
--log-level	<p>Sets the level of logging produced during operation. For example:</p> <pre>./Hiero1.7v1 --log-level warning</pre> <p>Log messages are output to screen unless you specify a <b>--log-file</b>. There are four levels of detail, on a sliding scale from minimal to verbose:</p> <ul style="list-style-type: none"> <li>• <b>error</b></li> <li>• <b>warning</b> (default)</li> <li>• <b>message</b></li> <li>• <b>verbose</b></li> </ul> <p><b>Note:</b> Setting the logging level to <b>verbose</b> can produce large log files when <b>--log-file</b> is specified.</p> <p>See <a href="#">Setting Environment Variables</a> to set the log level using an environment variable.</p>
--quiet (-q)	<p>Launch the application without displaying the splash screen or startup dialog.</p>
--single-threaded-playback	<p>Launch the application in single-thread mode. This option can solve playback issues on various Linux Fedora flavours.</p> <p>See <a href="#">Setting Environment Variables</a> to set the playback mode using an environment variable.</p>

On Windows, you can also use the same arguments on executables (or their shortcuts) by adding them to the program's Properties. To use a startup argument:

1. Right-click the **C:\Program Files\Hiero 1.7v1** or **HieroPlayer 1.7v1** icon or the equivalent icon on the Desktop.
2. Click **Properties**.
3. Append the required argument to the **Target** or **.exe** field.

## Licensing Hiero and HieroPlayer

### About licences

- **Activation Keys**—these can be used to easily install and activate node locked (also known as uncounted) licences. Node locked licences allow you to use Hiero or HieroPlayer on a single machine. This licence does not work on different machines and if you need it to, you'll have to transfer your licence. Node locked licences do not require additional licensing software to be installed. See [Licensing Hiero on a Single Machine](#) for more information.
- **Floating Licences**—also known as counted licences, enable applications to work on any networked client machine. The floating licence is put on the server and is locked to a unique number on that server. Floating licences on a server require additional software to be installed. This

software manages those licences on the server, giving licences out to client stations that want them. The software you need to manage these licences is called the Foundry Licensing Tools (FLT) and it can be freely downloaded from our website. Floating licences often declare a port number on the server line and a port number on the vendor line. See [Licensing Hiero or HieroPlayer Over a Network](#) for more information.

The instructions below run through both licensing methods and you can find a more detailed description in the Foundry Licensing Tools User Guide available on our website [www.thefoundry.co.uk/support/licensing/tools/](http://www.thefoundry.co.uk/support/licensing/tools/)

## Licensing Hiero on a Single Machine

You can purchase activation keys over the Internet by clicking **Purchase Licence** in the licensing dialog that displays when you launch Hiero or HieroPlayer without a licence, or by contacting The Foundry Sales Department at [sales@thefoundry.co.uk](mailto:sales@thefoundry.co.uk).

### Installing the licence

You are prompted to enter your activation key when you start the application without a licence. This step is skipped if you've already activated the application.

Select an activation option from the **Licensing** dialog:

- **Purchase Licence**—click to open a web browser directly to The Foundry website to purchase an activation key.
- **Activate Licence or Use Server**—click to enter a previously obtained activation key. When you enter the activation key, the application automatically obtains a licence from the web and installs it on your machine. You're good to go.



**NOTE:** If you later want to change your licence (for example, from a node locked licence to a floating licence), you can select **Help > Licence** in Hiero to display the Hiero **Licensing** dialog.



**NOTE:** If you access the Internet through a proxy server and cannot connect to the activation server, you may get an error dialog prompting you to either:

- Click **Use Proxy** to enter the proxy server name, port number, username, and password. This enables the application to connect to the activation server and obtain a licence. The licence is then installed automatically.
- Click on the web link in the dialog and use the System ID (also known as hostid) provided to manually activate and install a licence. For more information on how to install a licence manually, see the Foundry Licensing Tools (FLT) User Guide available on our website at [www.thefoundry.co.uk/support/licensing/](http://www.thefoundry.co.uk/support/licensing/)

## Licensing Hiero or HieroPlayer Over a Network

Alternatively, you can purchase a floating licence key from our website. To generate a licence key, we need to know your System ID. The System ID (sometimes called Host ID or rlmhostid) returns a unique number for your computer. We lock our licence keys to the System ID. See [Installing floating licences](#).

To display your System ID, do any of the following:

- On Mac and Windows, you can download the Foundry Licence Utility (FLU) from [www.thefoundry.co.uk/licensing](http://www.thefoundry.co.uk/licensing) and run it. Your System ID is displayed.
- Download the Foundry Licensing Tools (FLT) free of charge from [www.thefoundry.co.uk/support/licensing/manage-floating-licences/rlm/](http://www.thefoundry.co.uk/support/licensing/manage-floating-licences/rlm/) and then:
  - On Mac, run `/Applications/TheFoundry/LicensingTools7.0/Foundry Licence Utility.app`
  - On Linux, run the following command in a terminal shell:  
`/usr/local/foundry/LicensingTools7.0/bin/systemid`
  - On Windows, run `C:\Program Files\TheFoundry\LicensingTools7.0\Foundry Licence Utility.exe`

Just so you know what a System ID number looks like, here's an example: 000ea641d7a1.

Once you have provided us with your System ID number and a licence key has been generated for you, you will receive the licence key in an email or Internet download. The licence key is contained in a text file called **foundry.lic**. For information on what to do with the foundry.lic file, see

[Installing floating licences](#) below.

### Installing floating licences

If you requested a floating licence from The Foundry, you will receive your licence key (foundry.lic) in an email or Internet download. You should also receive the Foundry Licence Utility (FLU) application to help you install the licence key. The instructions below tell you what to do with these.



**NOTE:** The FLU is also available to download from [www.thefoundry.co.uk/licensing](http://www.thefoundry.co.uk/licensing).

1. Make sure you have saved both the licence key (foundry.lic) and the Foundry Licence Utility application in the same directory.
2. Run the Foundry Licence Utility application.

The licence key automatically appears in the FLU window if the FLU and foundry.lic are in the same directory. If they are not, you can either copy and paste the contents of the licence key or drag-and-drop the file into the FLU window.

3. Click **Install**.

This checks the licence file and, provided that the licence is valid, installs it into the correct directory.

In order for the floating licence to work, you will need to install the Foundry Licensing Tools (FLT) on the licence server machine. For more information on how to install floating licences, refer to the FLT User Guide, which you can download from our website:

[www.thefoundry.co.uk/support/licensing/tools/](http://www.thefoundry.co.uk/support/licensing/tools/)

4. Once your licence server is up and running, launch the application (if it isn't already running).
5. Click **Activate Licence or Use Server** and enter the server address in the field provided. The format for the server name is:  
<port>@<servername>, for example, 30001@red.



**NOTE:** You must perform steps 4 and 5 on each client machine that requires a Hiero licence from the server.



**TIP:** If you later need to display the **Licensing** dialog again, you can select **Help > Licence**.

## Further Reading

For more information on licensing, displaying the System ID number, setting up a floating licence server, adding new licence keys, and managing licence usage across a network, you should read the Foundry Licensing Tools User Guide available on our website:

[www.thefoundry.co.uk/support/licensing/tools/](http://www.thefoundry.co.uk/support/licensing/tools/)

### 3 HIERO AND HIEROPLAYER WORKFLOW

#### Hiero

In a typical collaborative project environment, Hiero sits in between edit and grading, and finishing and delivery, acting as a hub for visual effects. It is used to locate, preview, and then farm media out to shot-based effects applications (such as Nuke), and take their results and re-integrate them into the sequences for review and comment. See [Collaborative Project Case Study](#) for more information.

Hiero can also be used as a “Hero” seat, passing content between timeline and shot creation using Hiero<>Nuke, without leaving the local machine. See [Hero Seat Case Study](#) for more information.

#### HieroPlayer

HieroPlayer sits next to your compositing and other shot creation software, allowing artists to view their work in the context of a timeline. This collaborative workflow allows multiple artists to work on the same timeline, viewing colleague’s work as well as their own. See [Collaborative Project Case Study](#) for more information.

HieroPlayer can also be used to maintain an element library. You can filter content using the bin structure, tags, and metadata and view elements on scratch sequences, passing clips between applications using Hiero<>Nuke. See [Element Library Case Study](#) for more information.

### Feature Comparison

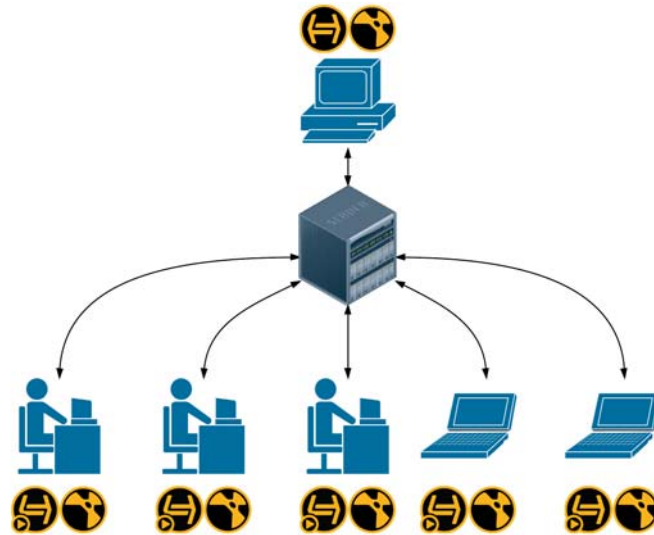
Designed to work hand-in-hand in different scenarios, Hiero and HieroPlayer share a number of features, but as the hub, Hiero has a richer feature set than HieroPlayer.

Feature	Hiero	HieroPlayer
<b>Review and Playback</b> - Robust playback & review engine for post production		
Multi-track timeline viewing and editorial workspace, including industry standard tools	✓	✓
Nuke equivalent format support including OpenColorIO management	✓	✓
Multi-channel audio import and playback	✓	✓
Extensive review toolset including A/B compare, masks, and colour picker	✓	✓

Feature	Hiero	HieroPlayer
Realtime image scopes including histogram, waveform, and vectorscope	✓	✓
Media localisation and caching	✓	✓
Broadcast Monitor support	✓	✗
<b>Conform</b> - Simple and flexible ingest of cuts from editorial.		
Conform multi-track timelines from CMX 3600 Edit Decision Lists (EDLs) and Final Cut Pro XML, including cuts, transitions and retimes	✓	✗
Session-wide spreadsheet containing all sequence events	✓	✗
<b>Shot Management and Export</b> - Manage, distribute and ingest media with ease		
Export sequences, timeline shot structures, clip hierarchies, and EDL/XMLs	✓	✗
Transcode, copy, and soft link media	✓	✗
Create template Nuke scripts for easy distribution of work	✓	✓
Automatically update VFX shots in context	✓	✓
Version shots and snapshot timelines for review and editing	✓	✓
Hiero<>Nuke integration - a live link between applications updating on-the-fly as VFX work is completed	✓	✓
Hierarchical project and element library management	✓	✓
Tag of shots, frames, and sequences for easy filtering of content	✓	✓
<b>Open and Scriptable Playback Framework</b> - Flexible enough to fit any pipeline		
Extensive Python API to accomplish most tasks through Python scripting that you can with the Hiero and HieroPlayer user interfaces	✓	✓
Integrated Pyside enabling fine-grained customisation of interface tasks	✓	✓

## Collaborative Project Case Study

As mentioned, Hiero can sit comfortably in a post pipeline as the hub for managing content. The diagram below shows a typical workgroup scenario.



Hiero, HieroPlayer, and Nuke in a collaborative project.

## Preparing a Project in Hiero

The first step in Hiero is to conform the EDL or XML from the editor. The conform process pulls together the required source clips and matches them to events in the EDL or XML. Hiero displays these events in a spreadsheet which is linked to a timeline showing the corresponding track items. See [Conforming Using Hiero](#) for more information.

Once the conform is complete, you can view your timeline to confirm that the correct clips are present, check the content using Hiero's scopes, add reference tracks, and pass on any pertinent information to the next step in production using tags and notes. See [Ingesting Media](#) for more information.

The next step is to make any minor edits to the timeline, including transitions and retimes, swap or rename track items, or examine different versions of clips on the timeline. See [Managing Timelines](#) and [Versions and Snapshots](#) for more information.

The final step before HieroPlayer steps in is to export and save your project. Exporting from Hiero and saving the project creates placemark track items for VFX work in a read-only Hiero project (.hrox file), preserving the conform work from Hiero. Multiple artists can then work on track items, creating versions which are then automatically updated in HieroPlayer. See [Round-Tripping Using the Export Dialog](#) for more information.

## Loading a Hiero Project in HieroPlayer

HieroPlayer is most commonly used to open Hiero projects as read-only copies to preserve conform work from Hiero. This way, multiple artists can work on a project without worrying about overwriting a colleagues work.

To open a Hiero project in read-only form:

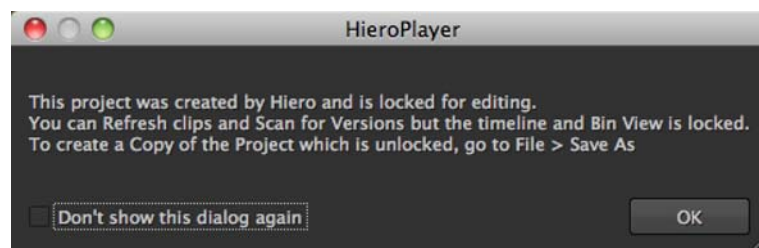
1. Launch HieroPlayer and navigate to **File > Open**.



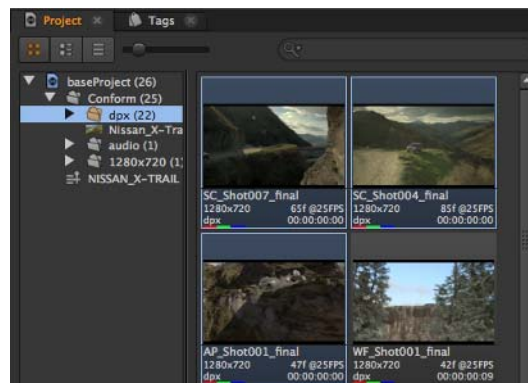
**TIP:** You may find that the project you require is displayed in the startup dialog under **Recent Projects**.

Select the project and click **Open** to quickly access the project.

2. Locate the required Hiero project using the browser and click **Open**.  
A warning displays informing you that the project is read-only, as it was created in Hiero.



3. Click **OK** to dismiss the prompt.
4. Opening a Hiero project in HieroPlayer changes the interface highlight colour to light blue to indicate that the project is read-only.



You can't delete bins, clips, or track items, or make edits on the timeline when the highlight is light blue.

See [Using Hiero<>Nuke in HieroPlayer](#) for information on how to update work between HieroPlayer and Nuke.

## Opening a Writable Hiero Project

If you want to open a writable version of a Hiero project, you can open the project and save it as a HieroPlayer project. HieroPlayer projects are always readable in Hiero, so don't worry about backward compatibility.

To open a Hiero project in writable form:

1. Launch HieroPlayer and navigate to **File > Open**.

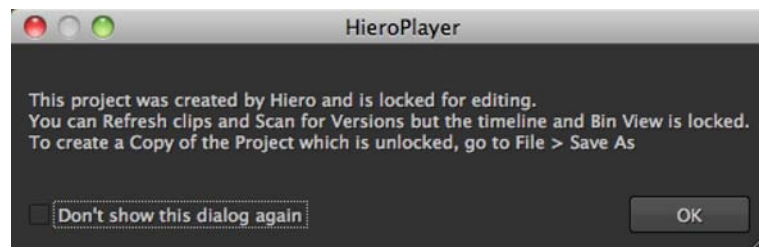


**TIP:** You may find that the project you require is displayed in the startup dialog under **Recent Projects**.

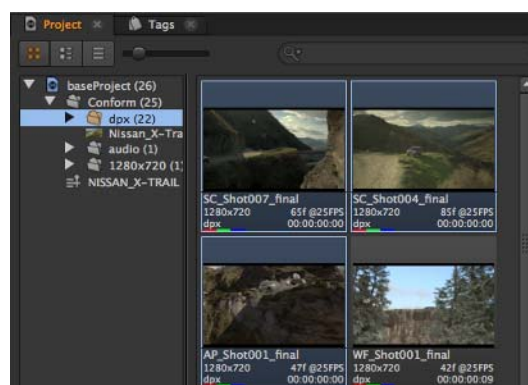
Select the project and click **Open** to quickly access the project.

2. Locate the required Hiero project using the browser and click **Open**.

A warning displays informing you that the project is read-only, as it was created in Hiero.



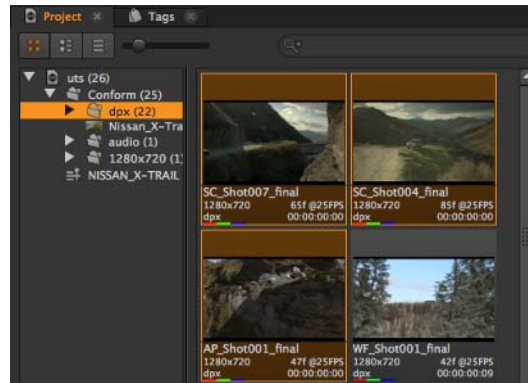
3. Click **OK** to dismiss the prompt.
4. Opening a Hiero project in HieroPlayer changes the interface highlight colour to light blue to indicate that the project is read-only.



You can't delete bins, clips, or track items, or make edits on the timeline when the highlight is light blue.

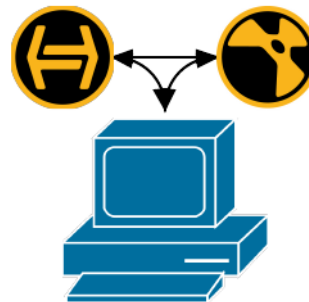
5. Navigate to **File > Save as Player Project** and select a save location.

- The highlight colour changes to orange to indicate that the project is now writable.



## Hero Seat Case Study

Running Hiero and Nuke on the same machine can really take advantage of the Hiero<>Nuke connection, an open port between the two applications, that doesn't require using Hiero's **Export** dialog.



Round-tripping using Hiero<>Nuke.

After connecting Hiero<>Nuke, changes made to clips in one application are automatically updated in the other. For example, VFX work in Nuke is added automatically to the scanned versions dialog in Hiero's timeline as it is completed.

See [Round-Tripping Using Hiero<>Nuke](#) for more information.

## Element Library Case Study

As well as acting as a timeline context review tool in collaborative workflows, HieroPlayer is well suited to passing elements from a library to Nuke over the Hiero<>Nuke connection.



Pass elements easily from  
HieroPlayer to Nuke.

Ingest and tag your elements in HieroPlayer, then use the tag filtering and flagging field to quickly locate elements with the required tags. See [Ingesting Media](#) and [Using Tags](#) for more information.

HieroPlayer also features all Hiero's editing capabilities, allowing you to create scratch timelines to view elements in context. See [Timeline Editing Tools](#) for more information.

## 4 CUSTOMISING YOUR WORKSPACE

### Workspace Overview

The Hiero and HieroPlayer interfaces are customisable using floating panes and show/hide functionality, but several default workspaces are supplied for your convenience:



**NOTE:** HieroPlayer doesn't include any Conform functionality and projects loaded from Hiero can't be edited unless they're resaved using **File > Save as Player Project**.

- Hiero's **Conforming** workspace is where the bulk of the work you undertake with Hiero is done. The linked spreadsheet and timeline panes are where you'll really see the power of Hiero.
- The **Editing** workspace provides the tools you'll need to fine-tune your media in Hiero.
- The **Reviewing** workspace is shared by both applications and is used to confirm your media intent is fully realised. You can add tags and notes, mark In and Out points on clips and timelines, and organise your ingested media into bins as required.
- The **Flipbooking** workspace consists of a Viewer and Project tab and is used primarily as a review tool in HieroPlayer.
- The **Timeline** workspace is similar to Hiero's Editing space, but exclusive to HieroPlayer.

When you launch either application, you're presented with a startup dialog.



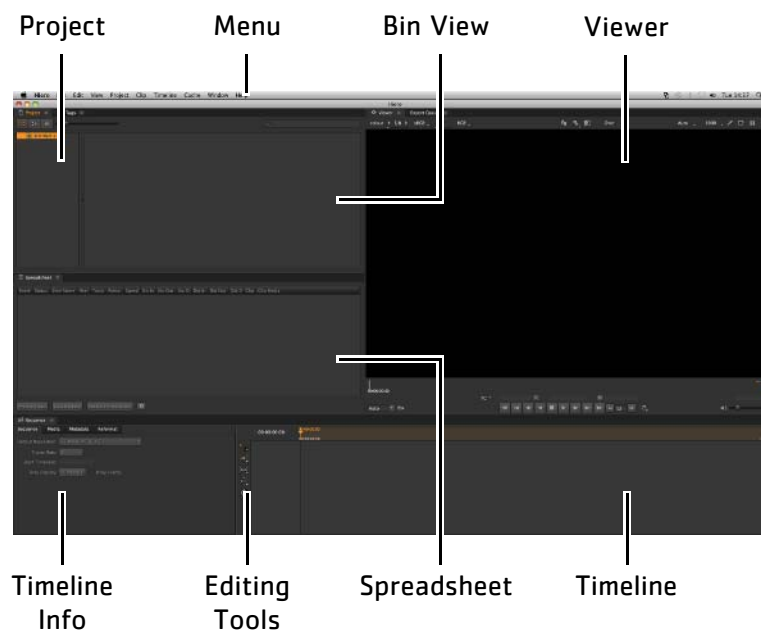
The startup dialog allows you to create a new project, open an existing project, or view the User Guide and website dedicated to Hiero.



**TIP:** You can disable this dialog by checking **Don't show this dialog again** or by toggling it off in the [Workspace Preferences](#) dialog.

Select the required option or click **Close** to access the application. Take a moment to familiarise yourself with the default workspaces.

Hiero's default **Conforming** workspace:

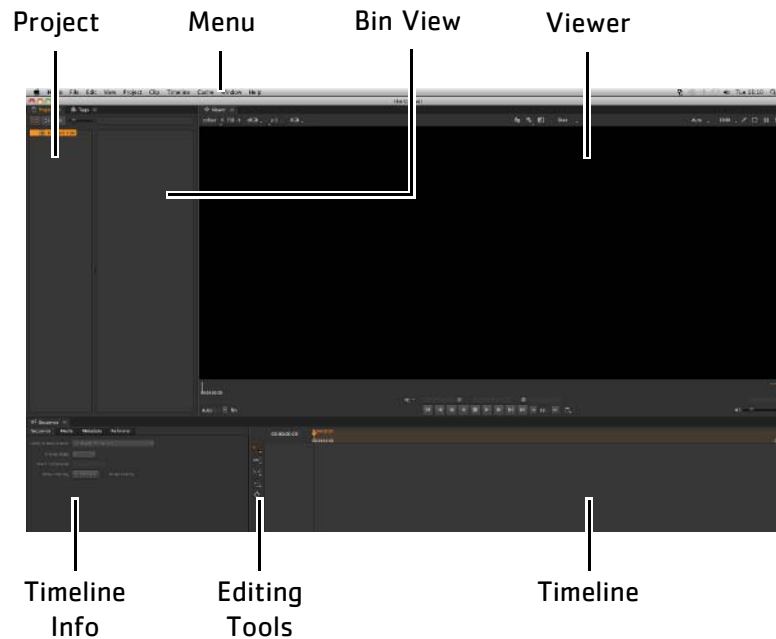


1. **Project**—manage all aspects of your projects and bins.
2. **Menu bar**—access Hiero's dropdown menus.
3. **Bin View**—displays the contents of any selected project bin.
4. **Viewer**—display and review your media.
5. **Timeline Info**—displays the current timeline's sequence, media, and metadata information.
6. **Editing Tools**—select the required editing tool. See [Timeline Editing Tools](#) for more information.
7. **Spreadsheet**—displays the contents of the timeline in spreadsheet form.
8. **Timeline**—displays the current timeline.



**NOTE:** The spreadsheet and timeline are linked, mirroring any selections made.

HieroPlayer's default Timeline workspace:



1. **Project**—manage all aspects of your projects and bins.
2. **Menu bar**—access Hiero's dropdown menus.
3. **Bin View**—displays the contents of any selected project bin.
4. **Viewer**—display and review your media.
5. **Timeline Info**—displays the current timeline's sequence, media, and metadata information.
6. **Editing Tools**—select the required editing tool. See [Timeline Editing Tools](#) for more information.
7. **Timeline**—displays the current timeline.

## Menu Bar Components

The Menu Bar contains various controls, many of which are available through right-click menus, hotkeys, and toolbars.

For a full list of hotkeys, buttons, and menu functions, refer to [Appendix A](#).

You can switch between workspaces by navigating to **Window > Workspace** and selecting **Conforming**, **Editing**, **Reviewing**, **Flipbooking**, or **Timeline**. Alternatively, you can toggle between the default workspaces using **Shift+F1**, **Shift+F2**, **Shift+F3**, and so on.

Any custom workspaces you create are added to the end of the list. You can access the first custom workspace using **Shift+F5**, and so on.

## Creating Your Own Workspace

Workspace consists of panes, which act like containers, and tabs which describe the individual areas you work with in Hiero and HieroPlayer. During the customisation process, you can:

- Resize your entire workspace or panes independently.
- Split panes to create new work areas, for example two Viewers side-by-side.
- Add and remove panes and tabs as required.
- Float and nest tabs to group similar functions together, for example Histogram, Vectorscope, and Waveform in the same pane.
- Maximise the pane under the mouse cursor by pressing ~ (tilde). Press ~ again to return to the regular interface.

You can create as many workspaces as you require, one for each project you undertake if necessary. In practice though, you may find that two or three custom workspaces will cover your needs.



**TIP:** You can return to the saved version of a workspace by navigating to **Window > Workspace > Reset Workspace**.

### Resizing your workspace

Resizing the interface, panes, and tabs works in much the same way as other software applications:

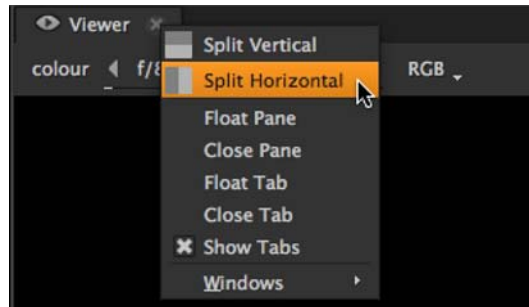
- To resize the entire interface, drag the resize handle at the bottom right of the application to the required width and height.
- To resize individual panes, hover the mouse over the edges of the required area until the cursor changes to the resize icon. Click and drag the cursor to resize the pane or tab.



### Splitting panes

Splitting panes allows you to organise your workspace into distinct areas delineated by well-defined borders.

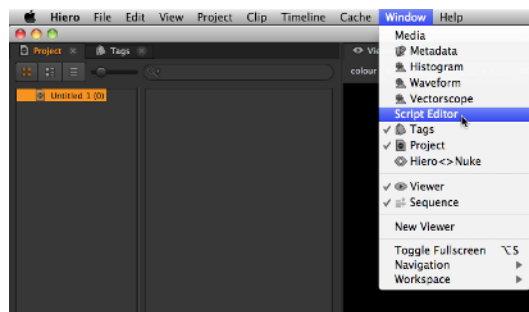
- To split panes, right-click the required pane and select **Split Vertical** or **Split Horizontal**.



### Adding and removing panes and tabs

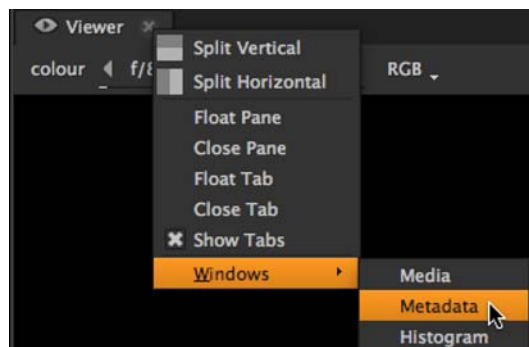
Adding and removing tabs gives you the freedom to personalise your workspace depending on your current project.

- Add new tabs by:
  - Navigating to **Window** and selecting the required tab. The tab is embedded in its default position or added to the interface as a floating window,

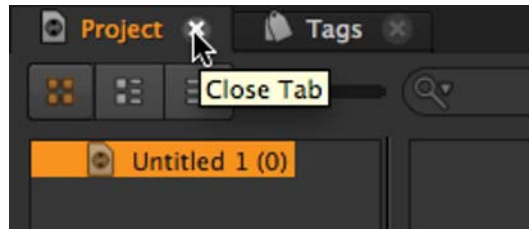


OR

- Right-clicking the pane in which you want the tab to appear and selecting it from the **Windows** dropdown.

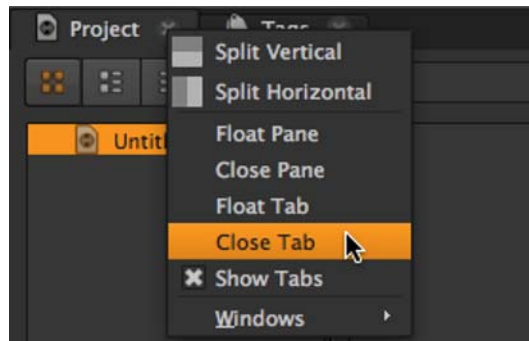


- Close any tab that is not required by:
  - Clicking the x on the tab's right-hand side,



OR

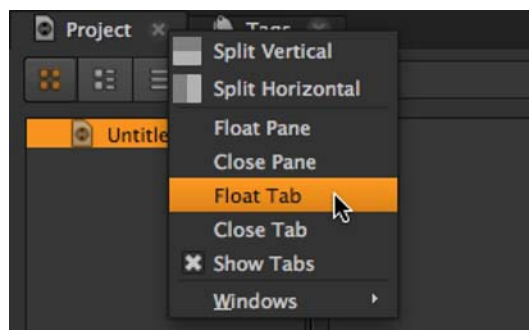
- Right-clicking the tab name and selecting **Close Pane** or **Close Tab**.



### Floating and nesting

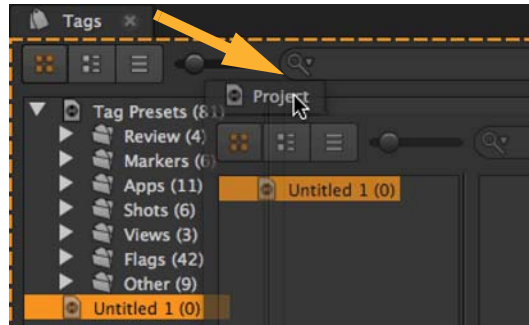
You can move existing panes and tabs to new locations in the interface (to help you organise your project).

- Float a pane or tab by:
  - Right-clicking the tab name and selecting **Float Pane** or **Float Tab**.

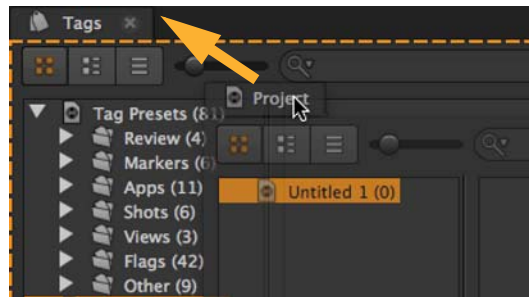



OR

- Dragging the required tab from its current location.



- Nest any floating pane or tab by dragging it to any existing pane.

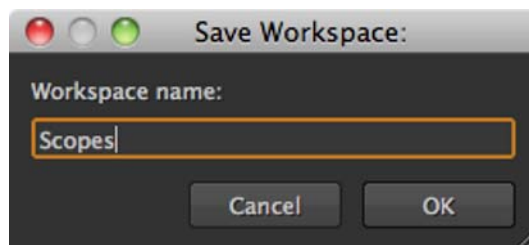


**TIP:** Use the orange highlight  around the destination pane to help you determine where the tab nests.

## Saving Workspaces

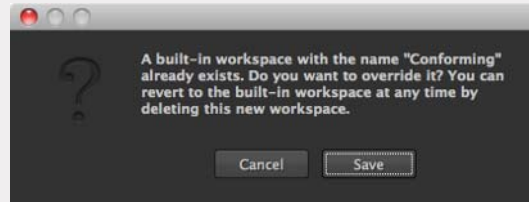
Once you're happy with the changes you've made to the workspace, navigate to **Window > Workspace > Save Workspace**.

Enter a name for the workspace, then click **OK** to preserve your workspace as a workspace file (extension **.hws**).





**TIP:** If you save a workspace called **Conforming**, **Editing**, **Reviewing**, **Flipbooking**, or **Timeline** you can override the defaults supplied with either application by clicking **Save** in the dialog box.



Delete the workspace you created to restore the default layout.

## Loading Workspaces

To use a previously saved workspace, navigate to **Window > Workspace** and select the custom workspace name you require.



**TIP:** Alternatively, you can use the workspace hotkeys **Ctrl/Cmd+n** (where **n** is equal to the number of the custom workspace).

Your pre-saved workspace is loaded.

## Deleting Workspaces

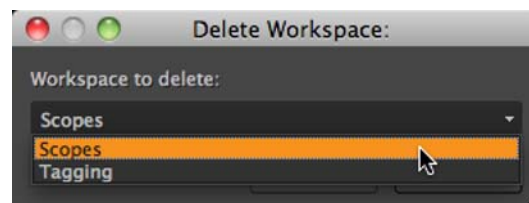
You may find that after using Hiero or HieroPlayer on a number of projects, some of the workspaces you created earlier have been superseded by more useful entries. **Delete Workspace** allows you to clear up your saved files, although you can remove the files manually from the save location.



**TIP:** You can return to the saved version of a workspace by navigating to **Window > Workspace > Reset Workspace**.

To delete custom workspaces:

1. Navigate to **Window > Workspace > Delete Workspace**.
2. Select the required workspace from the dropdown menu.



3. Click **OK** to delete the selected entry.

## Workspace Preferences

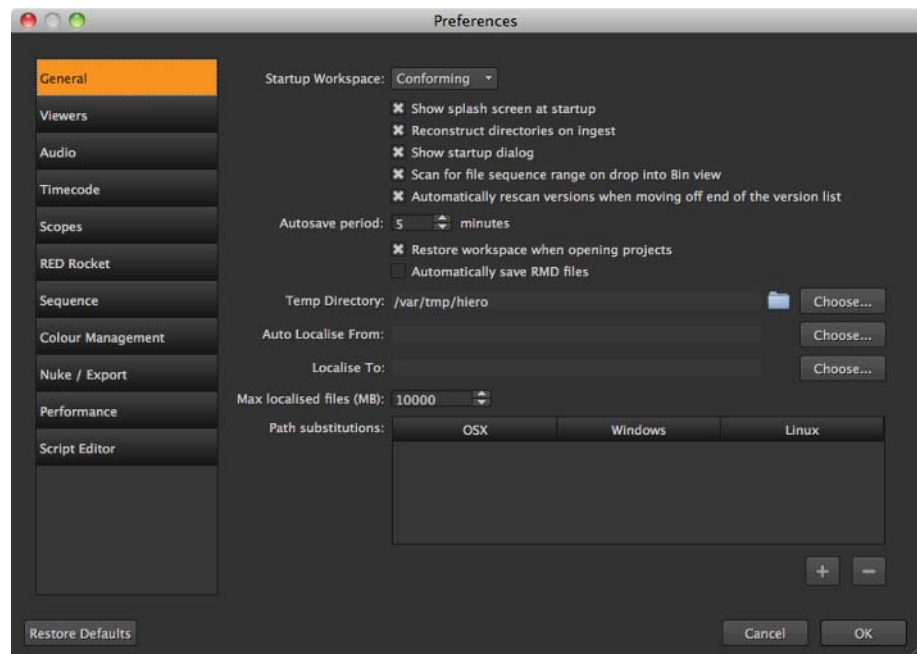
The **Preferences** dialog allows you to make global changes to the way the interface behaves every time you start Hiero or HieroPlayer. Changes you make in the **Preferences** override any local changes when you restart the application.



**NOTE:** Workspace Preferences are saved in the `~/.hiero/uistate.ini` file.

To access the **Preferences** dialog, either:


- Navigate to **Hiero (HieroPlayer) > Preferences (OS X)** or **Edit > Preferences (Linux and Windows)**, or
- Use the Preferences hotkeys **Ctrl/Cmd+, (comma)**.



- **General** preferences take care of how the applications start up, how often your work is automatically saved, localisation, and cross-platform compatibility.

Preference	Description
Startup Workspace	Sets the default startup workspace.
Show splash screen at startup	Enables or disables the product page during startup.
Reconstruct directories on ingest	When enabled, preserve the original folder/file hierarchy during ingest.

Preference	Description
Show startup dialog	Enables or disables the <b>Settings</b> dialog during startup.
Scan for file sequence range on drop into bin view	<p>When enabled, dragging a single file or file range, that is part of an image sequence, creates a clip in the bin view containing all available frames.</p> <p>When disabled, only the dragged frame or range is imported into the bin.</p> <p>See <a href="#">Using Drag-and-Drop</a> for more information.</p>
Automatically rescan versions when moving off end of the version list	When enabled, incrementing a clip or track item's version past the end of the previously discovered versions list, forces a rescan to update the versions list. See <a href="#">Using Versions</a> for more information.
Warn when opening a locked Hiero project (HieroPlayer only)	<p>When enabled, opening a Hiero project in HieroPlayer displays a read only warning.</p> <p>If you disable this option, you won't be warned but the clips and sequences in the project will still be coloured light blue to remind you of the read only state of the project.</p>
Autosave period	Sets how often you want to save your work in the background. Use the up and down arrows or type a new value in the field.
Restore workspace when opening projects	<p>When enabled, restore the saved workspace layout at project load.</p> <p>When disabled, use the <b>Startup Workspace</b> when you open an existing project.</p>
Automatically save RMD files	When enabled, automatically save changes to a RED clip's Look effects in an RMD file.
Temp Directory	<p>Defines the directory used to cache thumbnail information.</p> <p>You can disable caching using an environment variable, as described in <a href="#">Environment Variables</a>.</p>
Auto Localise From	<p>Sets the working directory that is automatically cached on ingest to the <b>Localise To</b> directory.</p> <p>For example, setting the filepath to <b>/project/myclips/footage</b> would locally cache media from that directory on ingest, up to the <b>Max localised files</b> limit.</p>
Localise To	<p>Sets the local directory where cached files are stored. See <a href="#">Caching Media Locally</a> for more information.</p> <p><b>Note:</b> If this filepath is not specified, cached files are saved in a subdirectory of the folder specified in <b>Temp Directory</b>.</p>
Max localised files (MB)	Sets the maximum space available for localised caching. Negative values in this field reserve the specified amount of space at all times. For example, -2000 stops 2 GB of memory being used for caching.

Preference	Description
Path substitution	<p>Sets the mapping rules for cross-platform project sharing.</p> <p>The mapping rules allow the application to read platform specific filepaths by explicitly mapping them to Mac/Linux/Windows friendly names.</p> <p>Click the + icon to add an entry to the table and then enter the paths as necessary. For example:</p> 

- **Viewers** preferences determine the default settings for the Viewer at startup as well as all new Viewers that you add to the workspace—you can still adjust the settings of individual Viewers.

Preference	Description
Playback Mode	Sets the default playback mode for new Viewers. See <a href="#">Viewer Tools</a> for more information.
OpenColorIO config file	<p>Sets the OpenColorIO configuration to use if you don't intend to use the default settings.</p> <p>Enter the filepath of the configuration file or click <b>Choose</b> to use the browser.</p> <p><b>Note:</b> Hiero and HieroPlayer also include an environment variable method for setting a config file. See <a href="#">Environment Variables</a> for more information.</p>
Guides	Selects the default <b>Guides</b> to apply to Viewers. Choose from <b>Title Safe</b> , <b>Action Safe</b> , and <b>Format</b> . See <a href="#">Viewer Tools</a> for more information.
Fullscreen Display	Controls where the Viewer expands to when in <b>Fullscreen</b> mode.
See through missing media	When enabled, any offline media on a timeline is treated as transparent, allowing the Viewer to display the track underneath.
Crop to format	When enabled, clips or track items that extend outside the format guide are cropped.
Background	<p>Sets the Viewer background colour, including sliders to control brightness. Choose from <b>Black</b>, <b>Grey</b>, or <b>Checkerboard</b>.</p> <p><b>Note:</b> Hiero and HieroPlayer currently treat all alpha channels as premultiplied, which can result in the Viewer background being "added" to the image. If you're working with un-premultiplied images, set the Viewer background to <b>Black</b>.</p>

Preference	Description
Frame Increment	Sets the frame increment amount for <b>Skip</b> and <b>Nudge More</b> operations. This control only affects new Viewers.
Filtering mode	This allows you to specify the Viewer behaviour when filtering your sequences for display. <ul style="list-style-type: none"> <li>• <b>Nearest neighbour</b> and <b>Linear</b>—standard OpenGL filtering options.</li> <li>• <b>Auto</b>—mimics the previous Viewer filtering, which was based on Nuke’s behaviour.</li> </ul>

- **Audio** preferences control how audio behaves in Hiero and HieroPlayer. See [Audio and the Timeline](#) for more information.

Preference	Description
Disable audio	When enabled, audio output is muted throughout the application. <b>Note:</b> You must restart Hiero or HieroPlayer for this option to take effect.
Audio device	Sets the audio output device or driver.
Default latency adjustment (ms)	Sets the default audio latency for all new Viewers in milliseconds. Audio latency allows you to correct audio and video synchronisation by changing the point at which audio playback starts.  Positive values cause the audio track to start earlier in relation to the video track, and vice-versa.
Default volume	Sets the default audio volume for all new Viewers.

- **Timecode** preferences determine where selected file types derive their timecode.

Preference	Description
RED File Timecode	Sets the start timecode to use for conformed or ingested R3D files. Select <b>Default From File</b> , <b>Absolute Timecode</b> , or <b>Edge Timecode</b> .
Other Media Timecode	Sets where the start timecode for all other media is derived. Select <b>File Header</b> or <b>Frame Number</b> . See <a href="#">Ingesting Media</a> for more information.

Preference	Description
Max Valid Timebase	<p>Sets the maximum image header timebase above which the value is clamped.</p> <p>Image files are often created with application specific timebase values in the header description. This can lead to reading in spuriously high framerates and the clamp aims to prevent this from happening.</p> <p>If your clips do have extremely high framerates, increase this value as necessary to avoid clamping.</p>
EDL-Style Spreadsheet Timecodes	<p>Disabled by default, the <b>srcOut</b> and <b>dstOut</b> values use the film convention, representing the <b>last</b> frame of the cut.</p> <p>When enabled, the <b>srcOut</b> and <b>dstOut</b> values use the video convention, representing the frame directly <b>after</b> the cut.</p>

- **Scopes** preferences set the Black and White points for Histogram and Waveform Out of Range warnings individually, in the range 0-1.

Preference	Description
Black point	Sets the black out of range warning level.
White point	Sets the white out of range warning level.
Luma/chroma encoding	Sets how the scopes display luma and chroma information by selecting the <b>rec601</b> or <b>rec709</b> standard.

- **RED Rocket** preferences enable and disable your RED Rocket.

Preference	Description
Use RED Rocket card	When enabled, any RED Rocket card present can increase the rendering speed for R3D files significantly, especially at higher resolutions.

- **Sequence** preferences set the defaults applied to new timelines:

Preference	Description
Output Resolution	Sets the default resolution for new timelines. Video tracks on new timelines are cropped to the this format.
Frame Rate	Sets the default framerate to use when a new timeline is created.
Start Timecode	Sets the timecode starting point for new timelines.
Time Display	Sets whether new timelines are measured using Timecode or Frames for display purposes.

Preference	Description
Drop Frame	<p>Sets whether drop frames are accounted for or not when new timelines are created.</p> <p><b>Drop Frame</b> is a timecode display option that leaves out two frames from the 30 fps timecode sequence every minute (except every 10th minute) so that long running NTSC sequences are accurate to a real-time clock (NTSC framerate is 3000/1001, or approximately 0.01% slower than 30fps).</p> <p><b>Note:</b> Enabling <b>Drop Frame</b> is a Timecode display feature only—the source media remains a continuous stream of frames.</p>

- **Colour Management** preferences set the default colourspace applied to various display and file types. For example, setting **Viewer** to **None** displays all media in new Viewers with no colourspace applied to them.

Preference	Description
Viewer	Sets the default LUT applied to new Viewers.
Thumbnails	Sets the default LUT applied to thumbnails when ever they are generated in Hiero and HieroPlayer.
8-bit Files	Sets the default LUT applied to the specified ingested file type.
16-bit Files	
Log Files	
Floating Point Files	
Use OCIO nodes when exporting in Nuke	When enabled, Nuke uses the LUTs read from the OCIO config file specified in Hiero or HieroPlayer, rather than the Nuke native LUTs, and adds the relevant OCIO nodes to the script.

- **Nuke/Export** preferences define whether Hiero uses an external Nuke or HieroNuke and how transcoding is handled.

Preference	Description
Nuke Path	When <b>Use Specified Path For Hiero Renders</b> is enabled, sets the filepath to the external Nuke application you intend to use during round-tripping and Send to Nuke exports.
Use Specified Path For Hiero Renders	<p>When enabled, the Nuke application specified in <b>Nuke Path</b> is used to render your output.</p> <p>When disabled, the internal, command line only HieroNuke is used for rendering.</p>
Always Use Interactive Nuke licence	When enabled, renders on external Nukes use an interactive licence (if available).

Preference	Description
Launch as NukeX	When enabled, the Nuke application specified in <b>Nuke Path</b> is launched as NukeX, if a licence is available.  <b>Note:</b> On Mac, this option is greyed-out. If you need to Launch NukeX, specify the NukeX bundle in the <b>Nuke Path</b> field. For example:  /Applications/Nuke7.0v1/NukeX7.0v1.app
<b>Nuke Limits</b>	
Limit Nuke to improve Hiero UI responsiveness	When enabled, the user interface is still responsive during transcodes.  This option causes Nuke to use only 2 threads and 25% of available RAM during transcodes. As a result, transcoding may slow down considerably.
Do Not Limit Nuke	When enabled, transcoding uses as much processing power as possible, which may cause the user interface to become unresponsive.
Customise Nuke Limits	When enabled, use the <b>Threads</b> and <b>Cache Memory</b> fields to manually configure transcode handling: <ul style="list-style-type: none"> <li>• <b>Threads</b>—limits the number of threads available to Nuke.</li> <li>• <b>Cache Memory</b>—limits the amount of total cache memory available to Nuke.</li> </ul>



**NOTE:** Hiero supports render farm implementation using Python scripting. Scripts must be located in specific directories, dependent on platform, as listed in [Running Python During Startup](#). If no scripts exist, the dropdown is disabled.

Some example scripts are included in the Hiero package in the following directories:

- On Mac: /Applications/Hiero 1.7v1/Hiero 1.7v1.app/Contents/Plugins/site-packages/hiero/examples/
- On Linux: /usr/local/Hiero 1.7v1/Plugins/site-packages/hiero/examples/
- On Windows: drive letter:\Program Files\The Foundry\Hiero 1.7v1\plugins\site-packages\hiero\examples

- **Performance** preferences allow you to customise Hiero’s performance according to your machine’s capabilities. See [Optimising Read and Decode Performance](#) for more information.

Preference	Description
Default number of threads per reader	Sets the number of threads to use per reader. If your source files are located on high performance local drives, increasing the number threads can significantly improve read times.  CPU intensive operations, such as <b>.jpg</b> decoding, can also be improved by increasing the number of threads per reader.
Overridden number of decode threads per reader	Allows you to override the default number of decode threads used, dependent on file format.  Use the <b>plus</b> button to add an entry and then select the file format using the dropdown menu. Double click the <b>Number of threads</b> column to set the required number of decode threads for that format.
OpenEXR helper threads to use	Sets the number of helper threads to use for OpenEXR only. The default, zero, automatically sets the number of helper threads used.
ARRI helper threads to use	Sets the number of helper threads to use for ARRI only. The default, zero, automatically sets the number of helper threads used.
<b>Note:</b> The OpenEXR and ARRI helper thread preferences are independent of the threads per reader and override table per format settings.	
QuickTime decoders	Sets the number of background processes available to handle QuickTime file I/O. You must restart the application for this preference change to take effect.  <b>Note:</b> Using too many decoders can affect performance, depending on the available hardware.
Expand images from 3 to 4 channels per pixels	Enabling this option can improve playback performance for certain combinations of hardware at the expense of the number of frames cached.  <b>Note:</b> Expansion is enabled by default on Mac and Windows.
Playback cache size	Sets the percentage of total memory available for use as cache.  You can't set this to a value higher than 80% of the memory available (rounded down to the nearest half-GB). For example, if you have 6 GB of memory available, the maximum cache size available 4.5 GB.

Preference	Description
Lock cache into memory (Mac and Windows only)	When enabled, lock the playback cache in memory so that the operating system doesn't swap out the memory allocated for the playback cache.  This settings can improve playback performance, but reduces the amount of memory available to run other applications.  <b>Note:</b> Cache locking is enabled by default on Mac OS X and disabled by default on Windows.
Unlock cache when application is in background (Mac and Windows only)	When <b>Lock cache into memory</b> is active, enabling this control can improve system performance by allowing other applications to use the reserved system RAM when the application is running in the background.  Bear in mind that when the application becomes active again, there may be playback delays while the cache memory is swapped back in.  <b>Note:</b> Cache release is enabled by default on Mac OS X and disabled by default on Windows.
Pause decoding when the application goes to the background	When enabled, pause RAM caching when the application loses focus. When you click back into Hiero or HieroPlayer, caching picks up from where it stopped.
Clear cache when the application goes to the background	When enabled, the RAM cache is flushed when the application loses focus. When you click back into Hiero or HieroPlayer, caching starts again from the position of the playhead.

- **Script Editor preferences** control the appearance of Hiero's Script Editor.

Preference	Description
Font	Sets the font to use for display purposes in the Script Editor.
Font Size	Sets the font size to use for display purposes in the Script Editor.
Indent	Sets the indent amount, in spaces, to insert when <b>Tab</b> is pressed.
Save and restore script editor history	When enabled, the last entry in the Script Editor is restored at startup.

Once you've made your selections in the **Preference** dialog, click **OK** to save your changes. Bear in mind that changing some preferences, for example **QuickTime decoders**, **Scopes**, and **Use RED Rocket card**, require you to restart Hiero before they're applied.



**NOTE:** Click **Restore Defaults** to return to the default **Preference** settings.

## Optimising Read and Decode Performance

The **Performance** preferences enable you to get the best the results from the hardware you're using by specifying the number of "threads" used for reading and decoding media.

A thread is, at its most basic level, a series of operations (in this case reading and decoding frames) that operates concurrently with other sets of operations. Most media is read intensive, but highly compressed formats like **.jpg** are decode intensive. Increasing the number of threads can decrease the time it takes to perform an instruction. For example, decoding a **.dpx** file using 2 threads, instead of 1, decodes 2 frames in parallel.

Hiero and HieroPlayer default to 2 threads per reader to accommodate lower specification hardware, but the following guidelines may improve performance.

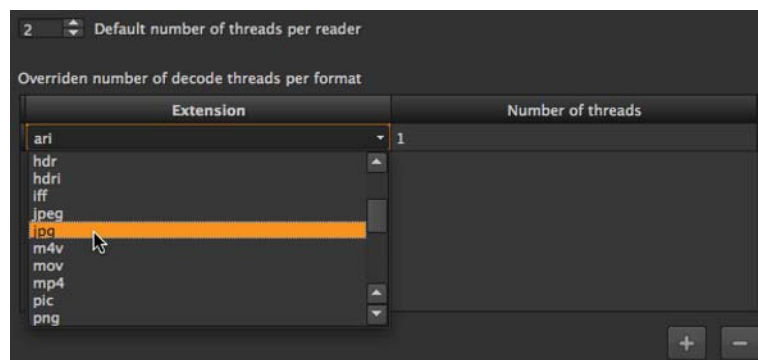
Operation	Recommended number of threads
<b>Read or I/O</b>	
Local HDD	2
Local SSD	3
Network HDD	2



**NOTE:** As a general rule of thumb, you shouldn't increase the number of threads above the number of cores in your machine.

You can override the **Default number of threads per reader** on a format-by-format basis using the override table in the **Preferences**.

1. Click the **+** icon to add an entry to the table.
2. In the **Extension** column, click the dropdown to select the file extension to override.



3. Enter the **Number of threads** to use for the selected format.

For example, **.jpg** files rely heavily on decoding so an override setting between 6 and 8 is recommended. Setting the default threads per helper to 6 is not advisable, except on high specification hardware.

4. Click **OK** to close the **Preferences** and apply the setting immediately, there is no need to restart the application, so feel free to experiment to achieve the best combination for your setup.

## Using Helper Threads

Hiero and HieroPlayer also include two additional helper thread settings dedicated to OpenEXR and ARRI files. These helper threads assist the reader threads to improve performance for **.exr** and **.ari** files.

You can change the number of available helpers using the up and down arrows, or by simply entering the number of required helpers in the fields provided.

In general, the default setting **0** should automatically assign helper threads correctly. If, however, your project is **.exr/.ari** heavy you might consider increasing the number of helper threads.



**NOTE:** The application must be restarted to apply changes to the ARRI helper setting.

## 5 INGESTING MEDIA

Hiero and HieroPlayer are able to handle the same file formats as Nuke (on the same operating system), including the associated embedded audio and **.wav** files.

For a full list of supported file formats and playback optimisation, see [Appendix B](#).



**NOTE:** Hiero and HieroPlayer currently treat all alpha channels as premultiplied, which can result in the Viewer background being “added” to the image. If you’re working with un-premultiplied images, set the Viewer background to **Black**. See [Workspace Preferences](#) for more information.

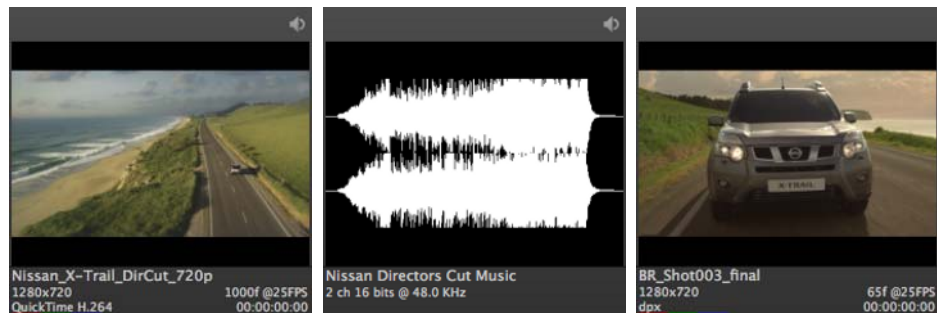
### About Clips

The interface sorts your bin clips into three broad categories: Audio and Video, Audio Only, and Video Only. Clips are displayed differently depending on their content, location, and in the case of the Viewer, the current mode (see [Viewer Tools](#)):



**NOTE:** Hiero and HieroPlayer don’t not currently support any QuickTime audio on Linux. Support for audio is scheduled for a later release.

#### Clips in bins



Audio and Video

Audio Only

Video Only

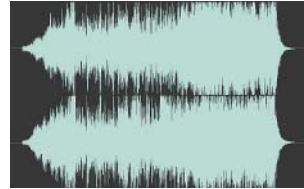


**NOTE:** The coloured bars under the thumbnail represent the layers available in the clip, in this case **colour**. Other layers include **alpha**, **depth**, and **motion**, similar to Nuke. See [Viewer Tools](#) for more information on displaying layers.

### Clips in the Viewer



Audio and Video

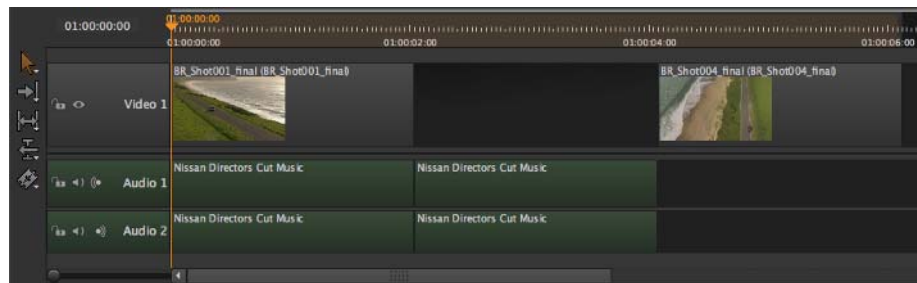


Audio Only



Video Only

### Clips, or track items, on a timeline



Audio and Video

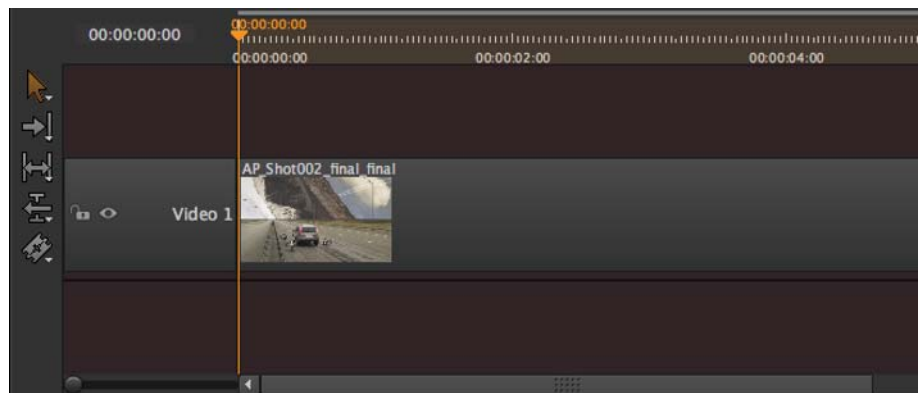
Audio Only

Video Only

(grey background)

See [Managing Timelines](#) for more information.

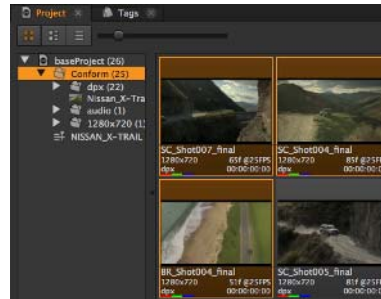
### A Clip opened in a timeline



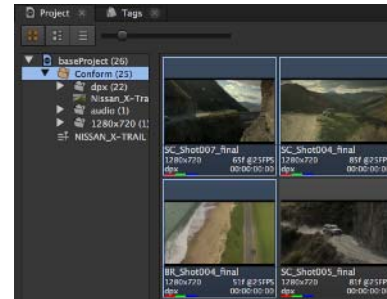
(purple background)

See [Using In and Out Markers](#) for more information.

Clips and track items are highlighted differently in Hiero and HieroPlayer read-only projects:



Clips selected in Hiero...



...and in HieroPlayer

The blue highlight denotes that the project is read-only. Once you've saved the project in HieroPlayer using **File > Save as Player Project**, the highlight changes to orange.

## Ingesting Media

Adding media to Hiero, and writable HieroPlayer projects, is as simple as drag-and-drop from a file browser or selecting **File > Import Clips** or **Import Folder**. Hiero imports your media into the bin view providing you with a thumbnail of all of your clips and preserving the original folder and file hierarchy.

Both applications soft import the media used in projects, creating symbolic links to locations on disk. See [Using the Copy Exporter](#) for information on how to quickly consolidate your media and projects, or [Caching Media Locally](#) to help stabilise playback.



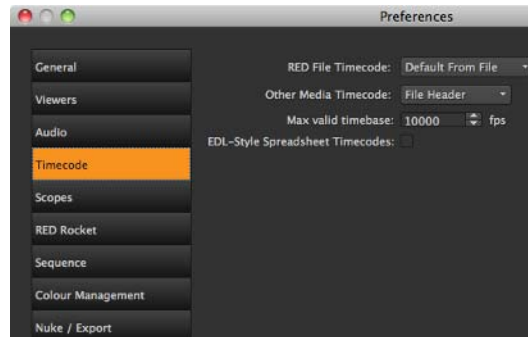
**NOTE:** Projects containing large amounts of movie files (for example **.r3d** and **.mov**) may exceed the number of available file handles per process, causing problems opening new files or projects and exporting.

You can increase the default limit of 1024 by entering the following command from the terminal, then running Hiero from the same session:

```
ulimit -Sn 2048
```

Clips with no inherent framerate information are assigned a framerate at ingest as specified in the **Preferences**.

1. Open the **Preferences** dialog by pressing **Ctrl/Cmd + ,** (comma).
2. Select **Timecode** from the submenu on the left.



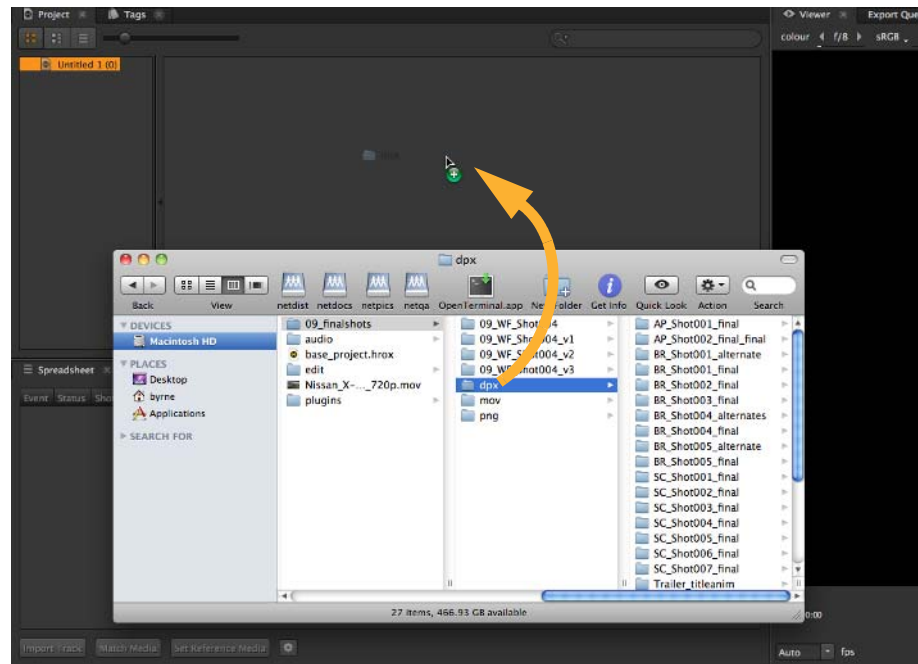
- Use the **RED File Timecode** dropdown to determine R3D clip behaviour:
  - **Default from File**—use the default set by the R3D file in question.
  - **Absolute Timecode**—force the use of the Absolute Timecode as specified in the clip metadata.
  - **Edge Timecode**—force the use of the Edge Timecode as specified in the clip metadata.
- Use the **Other Media Timecode** dropdown to determine clip behaviour for all other clips:
  - **File Header**—the file metadata header is used to derive the timecode, if it exists. This option defaults to **Frame Number** if the header is missing.
  - **Frame Number**—ignores the metadata header, even when present, and derives the timecode from the frames in the clip.
- Set the **Max valid timebase** allowed from the image header, above which the value is clamped.

Image files are often created with application specific timebase values in the header description. This can lead to reading in spuriously high framerates, and the clamp aims to prevent this from happening.

If your clips do have extremely high framerates, increase this value as necessary to avoid clamping.
- Enable or disable **EDL-Style Spreadsheet Timecodes**:
  - When disabled, the **srcOut** and **dstOut** values use the film convention, representing the **last** frame of the cut.
  - When enabled, the **srcOut** and **dstOut** values use the video convention, representing the frame directly **after** the cut.
- Click **OK** to save your settings.

## Using Drag-and-Drop

Simply locate your media in a file browser and drag the frame range, clip, folder, or folders into the **Project** tab.



Ingest behaviour depends on the target:

- Dragging a folder into the **Project** tab automatically ingests all the contents of the folder, including other folders and their contents.
- Dragging a movie file, such as a **.mov** or **.r3d**, automatically ingests the entire clip.
- Dragging a single file or file range, that is part of an image sequence, is controlled by the **Preferences > General > Scan for file sequence range** checkbox:
  - **Enabled**—the default setting, dragging a single file or file range, that is part of an image sequence, creates a clip in the bin view containing all available frames.  
For example, dragging frames 1–5 and 11–20 ingests the entire frame range.
  - **Disabled**—only the dragged frame or range is imported into the bin.  
For example, dragging frames 1–5 and 11–20 ingests two distinct clips, one containing 5 frames and one containing 10 frames.

## Using the File Browser

If you prefer to work with menus, you can also import clips using the file browser. You can import individual clip files, ranges, or entire folders, depending on the amount of media you intend to use.

1. Navigate to **File > Import Clips** or **Import Folders**.



**TIP:** You can also use the **Ctrl/Cmd+I** and **Shift+Ctrl/Cmd+I** hotkeys.

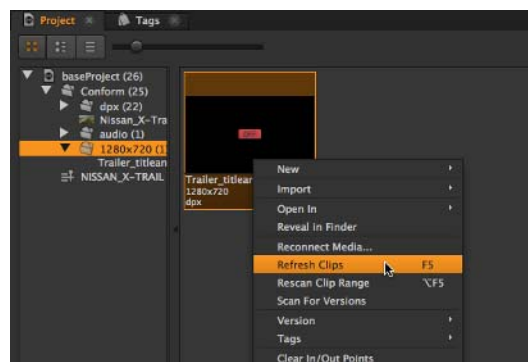
A browser dialog box displays.

2. Select the type of sequence to display:
  - **Auto Sequences**—displays only sequences containing appropriate file types, such as **.dpx** and **.jpg**. For example, **myclip.##.dpx**.
  - **No Sequences**—displays individual file names with out collapsing them into sequences. For example, **myClip.01.dpx**, **myClip.02.dpx**, **myClip.03.dpx**, and so on.
  - **All Sequences**—displays all possible sequences regardless of file type, including **.mov** and **.r3d**.
3. Check **split seq** to split incomplete sequences into separate clips.
4. Enter text in the **Filter** field and use the dropdown to show or hide files:
  - Select **\*** to display all files except hidden files.
  - Select **.\* \*** to display all files, including hidden files.
  - Select **\*/** to display directory names, but not their contents.
5. Select the file(s) or folder(s) that you require and click **Open**.

If you import folders, use the **Import Options** dialog to filter your ingest using inclusion and exclusion parameters, separated by spaces.
6. Hiero automatically sorts through your selection and only imports supported file types.

## Reconnecting and Refreshing Clips

During the post process, media inevitably changes location or form. You can reload or replace your media using the reconnect, refresh, and rescan functions.



Though all three options deal with reloading bin clips, each has a particular use dependent on context:

- **Reconnect Media**—allows you to redirect the filepath when the source file location changes.
- **Refresh Clips (F5)**—allows you to reload the clip when the source file location has not changed, such as when work has been done on the clip offline. Selecting refresh only refreshes the clip's current frame range.
- **Rescan Clip Range (Alt+F5)**—similar to **Refresh Clips**, above, but rescan also checks for additional frames that may have been added to the source file and adds them to the bin clip's frame range.

## Caching Media Locally

Hiero and HieroPlayer have the facility to cache files locally, either individually or by setting an automatically localised folder, to help guarantee playback stability. Local caching is controlled initially in the **Preferences** dialog, then on a clip-by-clip basis.

By default, files are cached to the same location as thumbnail data, though the path varies by platform:

- **Mac and Linux** - `/var/tmp/hiero`
- **Windows** - the system temporary directory, usually `C:\temp`

To setup your initial caching preferences:

1. Open the **Preferences** dialog by pressing **Ctrl/Cmd + ,** (comma).
2. Enter a filepath for **Auto Localise From**, if required.  
Any files that reside in this directory are automatically cached when conformed or ingested in Hiero.
3. Enter a filepath for **Localise To**, if required.  
Leaving this field blank creates a subdirectory in the **Temp Directory** as the local cache.
4. Enter a value for **Max localised files**, in mega bytes, to control how much disk space is available in the cache directory.



**NOTE:** Negative values in this field reserve the specified amount of space at all times. For example, -2000 stops 2 GB of memory being used for caching.

To cache individual clips and control localisation:

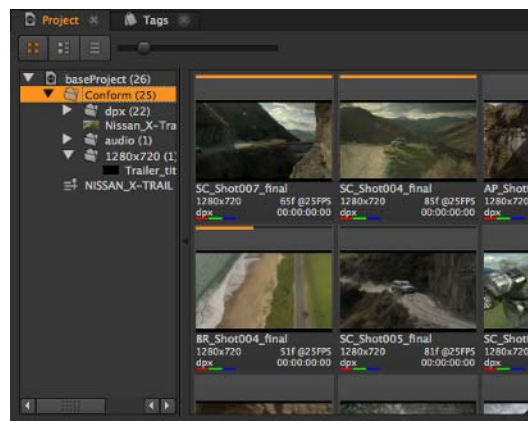
1. Select the clip(s) in the bin view.

2. Right-click and select **Localisation Policy** to display the available options:



- **Always**—the selection is cached, regardless of its location, as long as the **Max localised files** limit is not breached.
- **Never**—the selection is never cached, regardless of its location.
- **Auto**—the selection is cached if it resides in the **Auto Localise From** directory, as long as the **Max localised files** limit is not breached.

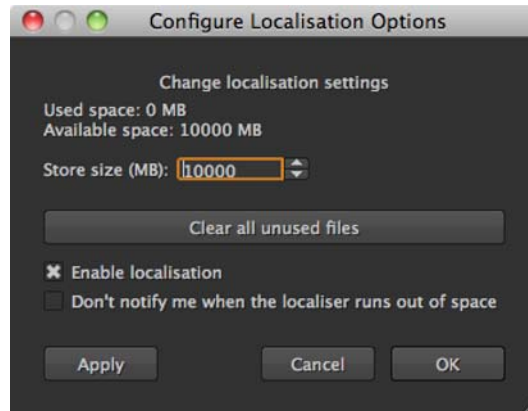
As clips cache, a progress bar displays in the thumbnail. Fully cached clips are marked with an orange bar at the top of the thumbnail.



3. Navigate to **Cache > Localisation > Edit Settings** to display **Localisation Options**.



**NOTE:** This dialog also displays when you reach the **Max localised files** limit.



4. The localisation cache defaults to 10000 MB, but you can change its size using the **Store size** field, if required.



**NOTE:** Negative values in this field reserve the specified amount of space at all times. For example, -2000 stops 2 GB of memory being used for caching.

5. You can enable or disable local caching by clicking **Enable localisation**. You can also toggle local caching on or off using the **Cache > Localisation** menu.
6. Click **Clear all unused files** to purge the localisation cache of all clips not in use in the current session. You can also purge the cache using the **Cache > Localisation** menu.
7. Check **Never notify...** to stop this dialog displaying if you run out of localisation cache space.
8. Click **Apply** to confirm changes without closing the dialog or click **OK** to close the dialog and accept changes.

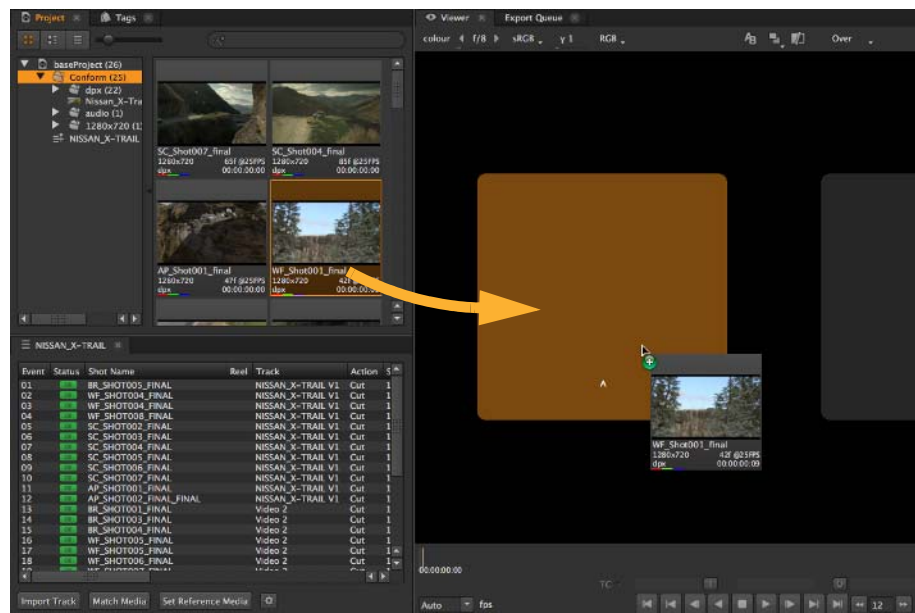
Hiero and HieroPlayer also feature a playback cache, allowing frames to be cached in RAM memory instead of on local disk. See [Caching Frames in the Playback Cache](#) for more information.

## 6 USING THE VIEWER

To view your media in the Viewer, simply drag-and-drop the clip or sequence from the **Project** tab on to a Viewer input, or particularly in the case of read-only projects, double-click the clip to send it to the Viewer.



**NOTE:** Hiero and HieroPlayer currently treat all alpha channels as premultiplied, which can result in the Viewer background being “added” to the image. If you’re working with un-premultiplied images, set the Viewer background to **Black**. See [Workspace Preferences](#) for more information.

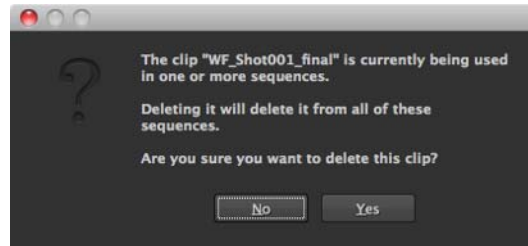


**NOTE:** On Linux builds with dual monitors, you may need to set which screen is synchronised for NVIDIA graphics cards. See [Syncing to VBlank](#) for more information.

### Deleting media

To remove media from the bin view, select the clip(s) or bin and press **Backspace** or **Delete**.

If any of the media is in use in a sequence, the following warning displays:



Click **Yes** to delete the media from the bin view, but bear in mind that all instances of the deleted media are removed from your current sequences.














**NOTE:** You cannot delete clips from HieroPlayer read-only projects.


## Viewer Tools

The Viewer has two sets of tools for manipulating your media: the Viewer tools and the playback tools. The Viewer tools, located at the top of the Viewer, are used to affect the mouse pointer as you move over the Viewer, and to select Viewer preferences:

Icon	Function	Description
	Layers	<p>Select the layer to output to the Viewer, for example <b>forward</b> motion vectors or <b>disparityL</b>. Only layers available in the clip are displayed—check the clip’s thumbnail to see at a glance which layers are present:</p> <ul style="list-style-type: none"> <li>•  red colour layer.</li> <li>•  green colour layer.</li> <li>•  blue colour layer.</li> <li>•  alpha layer.</li> <li>•  depth layer.</li> <li>•  forward motion vector layers.</li> <li>•  backward motion vector layers.</li> <li>•  all other custom layers, such as disparity.</li> </ul> <p><b>Note:</b> You can scroll through available layers using <b>PgUp</b> or <b>PgDn</b>.</p>

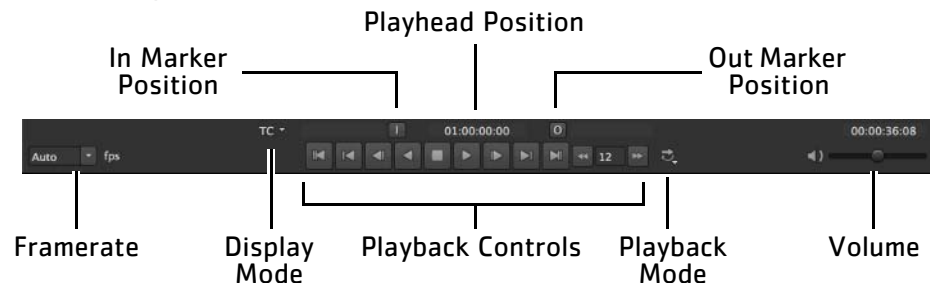
Icon	Function	Description
	Gain	Adjusts the gain applied to the linear input image before viewing, but doesn't affect your exported image.
	Viewer colour transform	Set the colourspace used to display images in the Viewer, for example <b>sRGB</b> and <b>rec709</b> . <b>Note:</b> If you have specified an OpenColourIO configuration file in the <b>Preferences</b> , you may have more colourspace choices available.
	Gamma	Adjusts the gamma applied to the image after the viewing transform, but doesn't affect your exported image.
	Channels	Select the channel(s) to output to the Viewer, for example <b>RGB</b> , single channel, <b>Alpha</b> , or <b>Luma</b> .
	Viewer Output	Sets the output for the current input and enables or disables tags.
	Viewer Layout	Select the Viewer configuration, <b>Stack</b> , <b>Horizontal</b> , or <b>Vertical</b> .
	SplitWipe	When both Viewer inputs contain an image, enable SplitWipe to compare the two images.
Blend Mode		Set the type of interaction between images in the Viewer, for example <b>Onion Skin</b> or <b>Difference</b> .
Image Quality		Set the Viewer image quality, for example <b>1:1</b> , <b>1:4</b> , or <b>1:16</b> . The default setting, <b>Auto</b> , resizes the image dependent on the Viewer zoom level, which may re-cache the image at a higher resolution. <b>Note:</b> Image quality, or proxy, for RED clips is dependent on the clip's <b>Decode Resolution</b> in the <b>Effect</b> tab. For example, if you're viewing a 4K file and the <b>Decode Resolution</b> is set to <b>Half Premium</b> , a 1:1 proxy value is equal to 2K, 1:2 is equal to 1K, and so on.
Scale		Set the scale applied to the clip in the Viewer, for example <b>25%</b> , <b>75%</b> , or <b>Fit</b> .
	Colour Sample	Enable or disable the RGBA colour information sampler in the Viewer. <b>Note:</b> The <b>Colour Sample</b> tool displays colour information from the source file, not the colourspace selected in the Viewer colour transform dropdown. See <a href="#">Working with Colourspaces</a> for more information.
	ROI	Click and drag to define a Region of Interest (ROI) in the Viewer. The scopes only display information within the ROI, when active.
	Pause playback caching	Pause or release Viewer playback caching, indicated by the green bar under the Viewer. See <a href="#">Caching Frames in the Playback Cache</a> for more information.

Icon	Function	Description
	Guides	<p>Enable or disable Viewer overlays:</p> <ul style="list-style-type: none"> <li>• <b>Title Safe</b>—any text intended for the audience should reside within this zone.</li> <li>• <b>Action Safe</b>—any visual elements intended for the audience should reside within this zone.</li> <li>• <b>Format</b>—adds a red, format-dependent box for the clip or sequence in the Viewer. Sequences support multi-format clips, see <a href="#">Viewing Multi-Format Timelines</a> for more information.</li> </ul>
	Mask	Enable or disable a range of Viewer masks, for example <b>16:9</b> or <b>1.85:1</b> .
	Non RT Playback	<p>Sets the Viewer playback mode:</p> <ul style="list-style-type: none"> <li>• <b>Play All Frames</b>—the default setting, plays all frames in realtime (dependent on hardware).</li> <li>• <b>Skip Frames</b>—plays frames in realtime skipping where necessary to maintain the framerate.</li> <li>• <b>Play All Frames, Buffering</b>—plays all frames by buffering and playing frames back as they become available.</li> </ul>
	See through missing media	<p>When disabled, any offline media on a timeline is treated as a blank clip so the Viewer cannot display the track underneath. This setting also applies to missing frames within a clip.</p> <p><b>Note:</b> This control only affects the current Viewer.</p>
	Crop to Format	Enable or disable cropping when viewing sequences. When enabled, areas outside the <b>Format</b> guide are cropped automatically.
	Clipping	<p>Enable or disable Hiero’s clipping warning tools:</p> <ul style="list-style-type: none"> <li>• <b>No Warnings</b>—all clipping warnings are disabled.</li> <li>• <b>Exposure</b>—alerts you when the image is under (blue) or over (red) exposed.</li> <li>• <b>Hot PAL Colours</b>—alerts you when the image chroma is too low (blue) or high (red) for PAL formats.</li> <li>• <b>Hot NTSC Colours</b>—alerts you when the image chroma is too low (blue) or high (red) for NTSC formats.</li> </ul>
	View	Select the Viewer display mode, for example <b>Audio and Video</b> or <b>Video Only</b> .
	Obey Alpha	<p>Allows you to control the alpha channel independent of the Viewer <b>Blend Mode</b>.</p> <ul style="list-style-type: none"> <li>• <b>Enabled</b>—any alpha channel present in the image is treated as premultiplied transparency.</li> <li>• <b>Disabled</b>—the alpha channel is ignored.</li> </ul>

Icon	Function	Description
	Audio latency	Sets the audio latency, in milliseconds, for the current Viewer only. Audio latency allows you to correct audio and video synchronisation by changing the point at which audio playback starts. Positive values cause the audio track to start earlier in relation to the video track, and vice-versa.
n/a	Pan	On Mac and Windows, hold <b>Alt</b> and drag the image to pan. On Linux, use <b>middle-click</b> and drag to pan.

## Playback Tools

The playback tools manipulate the media itself, in much the same way as other editing or playback software.



The playback tools can be summarised as follows:

- **In and Out markers**—numerical representations of the clip In and Out markers, if they're set.
- **Playhead position**—numerical representation of the current position of the playhead.
- **Framerate**—allows you to force the Viewer to play at a certain speed, within your hardware's limitations, by entering the required framerate in the field provided.
- **Display Mode**—select the timing method to display during playback:
  - **Timecode (TC)**—displays the timecode read from the clip's metadata or from the timeline.
  - **Timeline Frames (TF)**—displays the frame number read from the clip's metadata or from the timeline.
  - **Drop Frame**—is a timecode display option that leaves out two frames from the 30 fps timecode sequence every minute (except every 10th minute) so that long running NTSC sequences are accurate to a real-

time clock (NTSC framerate is 3000/1001, or approximately 0.01% slower than 30fps).



**NOTE:** Enabling **Drop Frame** is a Timecode display feature only—the source media remains a continuous stream of frames.

- **Playback Controls**—standard media playback controls including continuous or by frame forward and backward, skip to next or previous edit, skip to start/end of the timeline, and Frame Increment. The **J**, **K**, and **L** hotkeys also control playback. The **K** hotkey is mapped to **Pause/Play** and **JL** to backward and forward. Combinations are also supported:
  - **K+J**—frame backward.
  - **K+L**—frame forward.
  - **K+drag** in the top half of the Viewer—standard jog controls. Dragging the cursor left and right moves the playhead backward and forward, frame-by-frame.
  - **K+drag** in the bottom half of the Viewer—standard shuttle controls. Dragging the cursor left and right plays backward and forward, with increased framerate toward the edges of the Viewer.

The following table describes playback behaviour depending on the **Playback Mode** selected.

Mode	Description	In/Out Effect
Repeat	Play through from start to finish in an infinite loop.	Repeats within the In-Out Points.
Bounce	Play through from start to finish then reverse to the start and repeat.	Bounces within the In-Out Points.
Stop	Play through from start to finish then stop.	Play through to the Out Point.
Continue	Play once through all media in the Viewer sequentially.	In-Out range has no effect.

- **Volume**—controls the playback volume for the current Viewer.




**NOTE:** If the video framerate is unavailable, no audio is output. The speaker icon under the Viewer changes to the no audio playback icon if this is the case.



## Caching Frames in the Playback Cache

Hiero and HieroPlayer's playback cache places frames in RAM for rapid retrieval during playback, rather than copying the source files locally as with [Caching Media Locally](#).

The green bar under the Viewer represents the contents of the playback cache, a full bar indicating that the entire clip or timeline is currently accessible from RAM, optimising playback. You can:

- Temporarily disable caching using the pause button above the Viewer, or use the **P** hotkey. Clicking pause again, resumes caching from the playhead position. 
- Flush the cache completely by navigating to **Cache > Clear Playback Cache**. Caching is automatically paused after flushing, but clicking the pause button resumes caching from the playhead position.

There are also a number of **Preferences** that affect how much RAM is available and when caching should occur. To set the caching behaviour:

1. Navigate to **Hiero (HieroPlayer) > Preferences (OS X)** or **Edit > Preferences (Linux and Windows)**,  
OR  
Use the Preferences hotkeys **Ctrl/Cmd+, (comma)**.
2. Click the **Performance** sub-menu.
3. Set the total RAM cache available using the **Playback cache size** field.



**NOTE:** You can't set this to a value higher than 80% of the memory available (rounded down to the nearest half-GB). For example, if you have 6 GB of memory available, the maximum cache size available 4.5 GB.

4. Enable **Pause decoding when the application goes to the background** to pause playback caching when the application loses focus.  
When you click back into Hiero or HieroPlayer, caching picks up from where it stopped.
5. Enable **Clear cache when the application goes to the background** to flush the playback cache when the application loses focus.  
When you click back into Hiero or HieroPlayer, caching starts again from the position of the playhead.

### Mac OS X and Windows specific controls

Mac OS X and Windows handle memory differently to Linux and, as a result, these controls can improve performance:

1. Enable **Lock cache into memory** so that the operating system doesn't swap out the memory allocated for the playback cache.

This settings can improve playback performance, but reduces the amount of memory available to run other applications.



**NOTE:** Cache locking is enabled by default on Mac OS X and disabled by default on Windows.

2. Enabling **Unlock cache when application is in background** can improve system performance by allowing other applications to use the reserved system RAM when the application is running in the background.  
Bear in mind that when the application becomes active again, there may be playback delays while the cache memory is swapped back in.



**NOTE:** Cache release is enabled by default on Mac OS X and disabled by default on Windows.

## Using In and Out Markers

In and Out markers enable you to alter the duration of a clip to just the portions of the source that you require.

When a clip containing In and Out points is added to a timeline, you can slip the clip around the markers to adjust the clip's output. See [Timeline Editing Tools](#) for more information.

You can also use In and Out points to export certain portions of a clip or sequence. See [Transcoding](#) for more information.

To set In and Out markers:

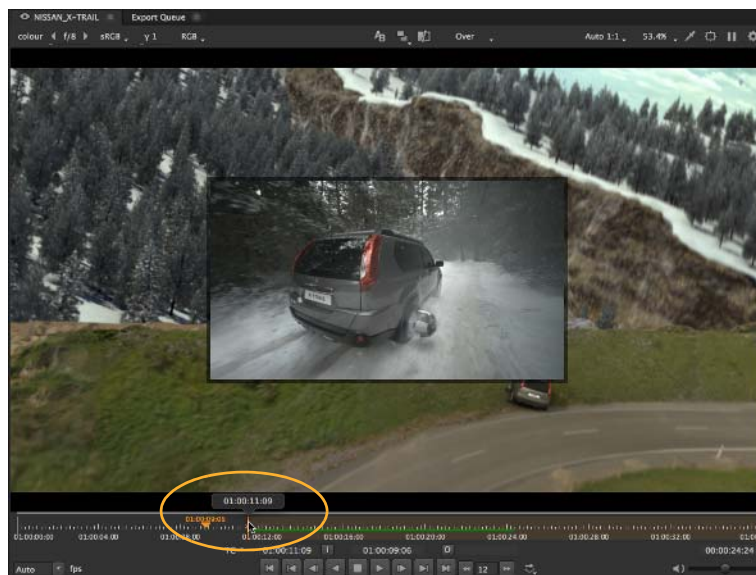
1. Right-click on the required clip or sequence and select **Open In > Timeline view**.  
Clips opened in a timeline have a purple background in the timeline.
2. Move the playhead to the location of the In point and press **I** on your keyboard.  
The In point is marked by the In tab and the time is recorded in the playback controls.
3. Move the playhead to the location of the Out point and press **O** on your keyboard.

The Out point is marked by the Out tab and the time is recorded in the playback controls.



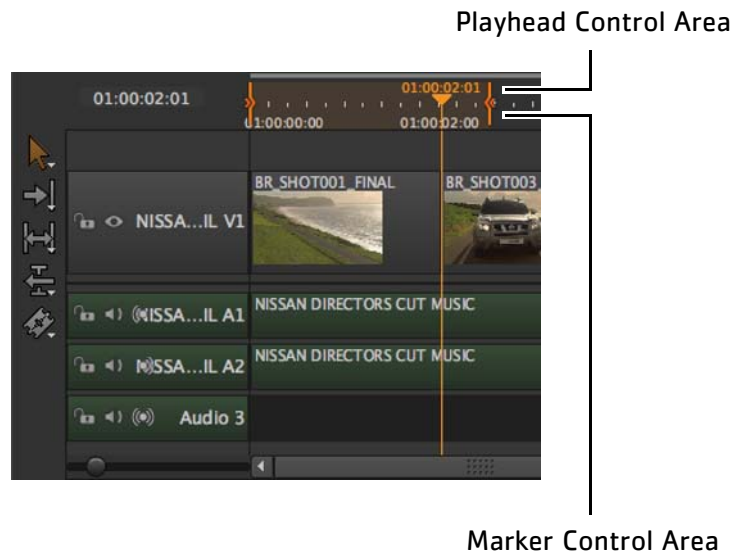
**TIP:** You can also set markers by navigating to **View > Mark In** or **Mark Out** or by using the **Timeline** menu to **Mark Selection** or **Mark Clip** dependent on clip selections on the timeline.

Click and drag the markers to adjust their position, or hold **Ctrl/Cmd** to move both markers at once, retaining their relative positions. A Viewer preview shows the current frame for the selected marker(s) and a timecode/frame popup helps to set the new position.



Clear the markers from your clip by navigating to **View > Clear In and Out Points**. The markers are removed completely, but you can reapply them by repositioning the playhead and pressing **I** or **O**.

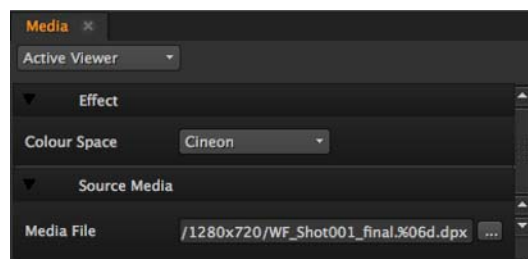
When the playhead is positioned near In and Out markers, the top half of the timecode scale controls the playhead and bottom half controls the markers.



## Using the Media Tab

The **Media** tab contains format specific controls dependent on the media currently in the Viewer. If the **Media** tab is not displayed in your workspace, navigate to **Window > Media** to open it in a floating window.

As an example, **.mov** files only allow you to control the **Colour Space** and **Source Media** for the clip or track item:

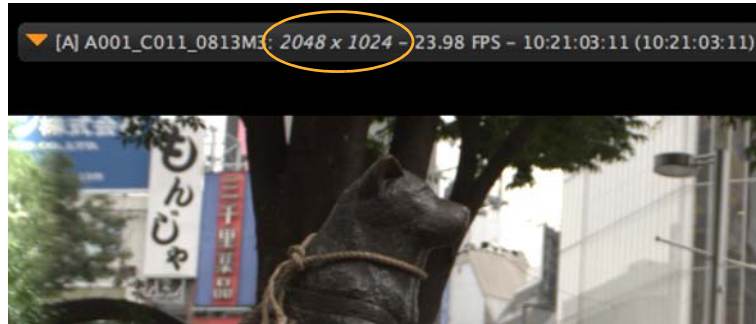


Whereas, R3D and ARRIRAW media use their own software development kits (SDKs) to control the extensive settings usually seen on RED and ARRIRAW Cameras, as well as the **Source Media**.

The RED **Decode Resolution** and ARRIRAW **Resolution** and **Proxy** dropdowns control the maximum allowed Viewer resolution, overriding the **Image Quality** setting.

When a clip's resolution is altered using these controls, the resolution

displayed in the Viewer is *italicised* to indicate that the clip is not displayed at full resolution.



**R3D NOTES:** The following R3D controls have no effect in Hiero's default 16-bit half-float decoding mode:

- Version (always set to ColorVersion2)
- Shadow
- Contrast
- CustomPDLogBlackPoint, CustomPDLogWhitePoint and CustomPDLogGamma
- RestrictedRange

This list is subject to change depending on the R3D software version in use.



**ARRIRAW NOTES:**

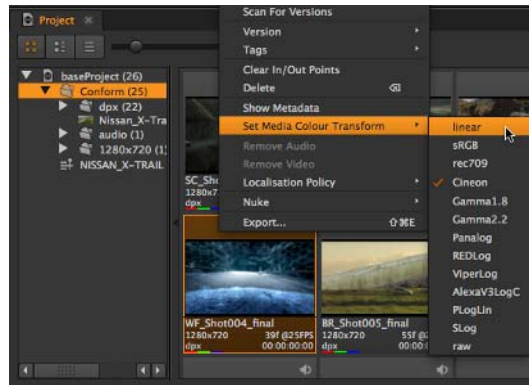
- ARRIRAW specific controls do not currently work in **LogC** colourspaces.
- Generally, the **Unsqueeze Anamorphic** control should not be enabled because the Hiero, HieroPlayer, and Nuke Viewers expand the image automatically.

## Working with Colourspaces

Colourspace changes are applicable to clips in bins and track items, as well as in the Viewer using the **Media** tab.

To apply colourspace changes to clips in bins:

1. Select the clip or clips in the bin view.
2. Right-click a selected clip and navigate to **Set Media Colour Transform**.



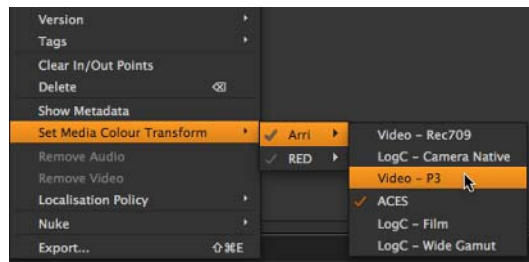
The current colourspace is highlighted with a tick mark.

3. Select the colourspace to apply to the clip selection.



**NOTE:** Only colourspaces applicable to the selection are displayed. For example, **REDspace** and **LogC - CameraNative** are only available for R3D and ARRIRAW clips, respectively.

4. Selecting multiple formats supporting different colourspaces, for example R3Ds and ARRIRAW, breaks the available LUTs into submenus:



To apply colourspace changes to track items:

1. Select the item(s) on the timeline.
2. Right-click a selected item and navigate to **Set Media Colour Transform**.
3. Select the colourspace to apply to the selection.

## Previewing on a Broadcast Monitor

Hiero's monitor out feature allows you to preview Viewer images on an external broadcast video monitor to check the final result, including the correct colourspace and aspect ratio. This option requires additional hardware, such as a monitor output card or a FireWire port.



**NOTE:** HieroPlayer does not support Monitor Out cards.

Hiero's monitor output architecture currently supports the cards listed below. Some monitor out cards allow you to extend or mirror your desktop so that Hiero's user interface is visible on the monitor. Please refer to your card's documentation for more information.

The following monitor out cards are currently supported, though other combinations of cards and drivers may work:

- AJA Kona series PCI cards and Io XT (Mac only, requires Thunderbolt port)
- Blackmagic DeckLink series PCI cards, UltraStudio Express and 3D (Mac only, requires Thunderbolt port)



**NOTE:** AJA monitor out cards are not currently supported on Linux.



**NOTE:** On Mac, the AJA Kona 3G is only supported on OS X Lion.

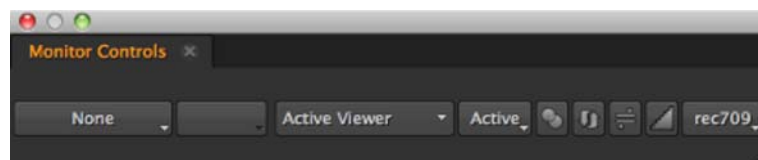


**NOTE:** Monitor out on Windows machines with AMD graphics cards is not currently supported.



To preview output on an external broadcast video monitor:

1. Navigate to **Window > Monitor Controls**.

The **Monitor Controls** toolbar displays in a floating pane.



2. Select the external device you want to use from the output device dropdown. All available devices are automatically detected and listed in this menu, along with the following default options:

- **None**—disables the monitor out feed.
  - **Floating Window**—opens up a pseudo output monitor window, without the need for a monitor device and card. This is intended for full-screen use without displaying any of Hiero’s interface.
3. Select the display format for the device selected in the previous step. The available options depend on the device you are using.
  4. Select the Viewer to feed to the output monitor using the source viewer dropdown. Selecting **Active Viewer** always display the current Viewer.
  5. Select the view mode using the A/B selection dropdown. All the usual Hiero A/B controls, such as **SplitWipe**, are available on the output monitor.
  6. Click the filter button to apply the active Viewer’s filtering, gamma, and gain to the monitor output. 
  7. Click the flip button to flip the output vertically.
  8. Click the range button to switch between full-range 0-255 (default) and 16-236 (ITU-R BT.610-4). This button can correct the image output for certain monitor out cards.
  9. Click the bit-depth button to toggle between 8- and 10-bit monitor output. 
  10. Select the colourspace to apply to the image, **rec709** in the example shown previously. If you’ve specified an OCIO configuration file in **Preferences > Viewers**, these custom LUTs are also applicable.



**NOTE:** If you plan to use the OCIO config file specified in Hiero or HieroPlayer, ensure that the **Preferences > Colour Management > Use OCIO nodes when exporting in Nuke** checkbox is enabled.

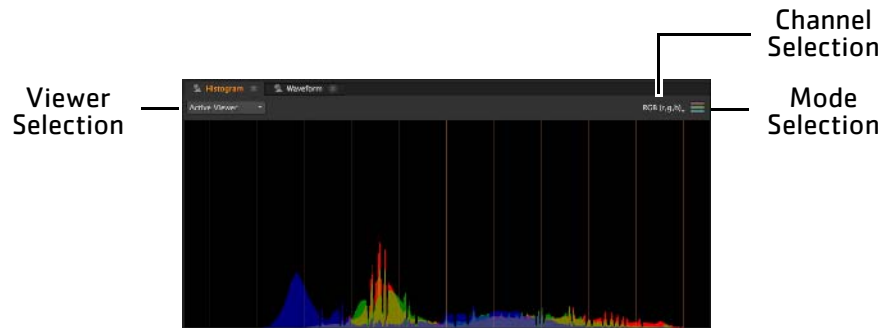
## Using Scopes

Hiero and HieroPlayer provide realtime scopes to help you evaluate your media. Realtime scopes provide data as the Viewer plays your clip, but you can also view the scopes frame by frame if you prefer.

## Histogram

The **Histogram** provides three colour channel and luma channel information that describes the distribution of red, green, blue, and luma pixels throughout the current frame.

The Histogram graphs the number of pixels at each brightness level, and from left to right, the areas of the Histogram represent shadow, mid tones, and highlights.

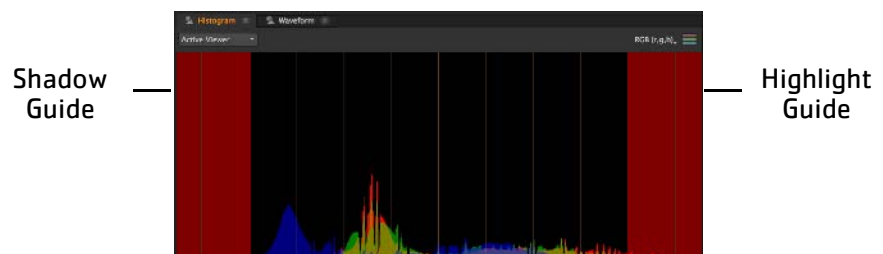


There are also **Viewer** and **Channel** selection controls on the **Histogram** tab:

- **Viewer selection**—if you have multiple Viewers open, use the dropdown menu to associate Histogram output to the required clip. The default value, **Active Viewer**, automatically displays details on the last Viewer you selected.
- **Channel selection**—select the channels to output. The default setting displays RGB, but you can also view channels separately.
- **Mode selection**—select the mode to output. The default setting displays ganged RGB, but you can also view the channels separately.

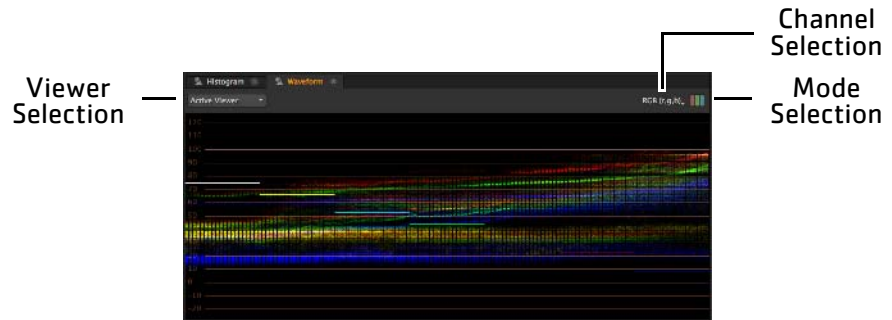
The scopes feature global customisable guides to help you view your clips. Navigate to **Hiero (HieroPlayer) > Preferences > Scopes (OS X) or Edit > Preferences > Scopes (Linux and Windows)** and enter values between **0** and **1** for the **Black** and **White** points.

The guides at the edges of the Histogram turn red to warn you when the distribution is out of range:



## Waveform

The **Waveform** scope provides information on clip luminance, or brightness, which you can use to decide whether the clip is over or under exposed. The white traces represent luminance values from 0 - 100% (black through the spectrum to white). The higher the waveform, the brighter the image in the Viewer.



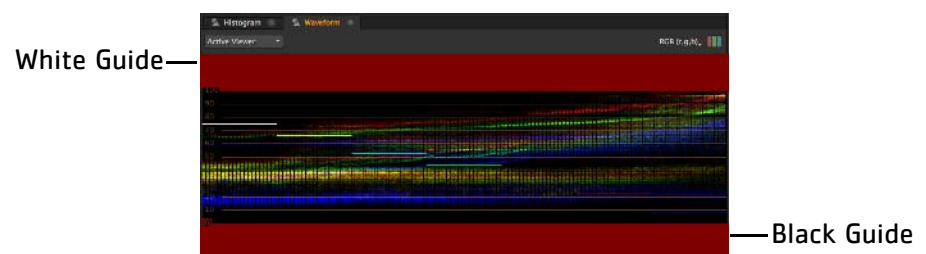
The upper white marker is used to measure when over exposure could be a problem. If your waveform has a lot of traces over the white marker, you should consider reducing the brightness of the clip. The opposite is true of the lower black marker.

There are also **Viewer** and **Mode** selection controls on the **Waveform** tab:

- **Viewer selection**—if you have multiple Viewers open, use the dropdown menu to associate Waveform output to the required clip. The default value, **Active Viewer**, automatically displays details on the last Viewer you selected.
- **Channel selection**—select the channels to output. The default setting displays RGB, but you can also view channels separately.
- **Mode selection**—select the mode to output. The default setting displays ganged RGB, but you can also view the channels separately.

The scopes feature global customisable guides to help you view your clips. Navigate to **Hiero (HieroPlayer) > Preferences > Scopes (OS X) or Edit > Preferences > Scopes (Linux and Windows)** and enter values between **0** and **1** for the **Black** and **White** points.

The guides at the top and bottom of the Waveform turn red to warn you when the distribution is out of range:



## Vectorscopes

**Vectorscopes** display colour, saturation, and hue information for the current frame. Similar to colour wheels, Vectorscopes display information radially, from the centre outward. The farther from the centre the data spans, the more saturation is represented.

In Figure 6.1, you can see that the frame represented contains mostly blues and cyans, but the values are not oversaturated. Figure 6.2 represents a badly saturated frame. Notice the spill of cyan traces distributed toward the edge of the scope pass the target (the highlighted square).

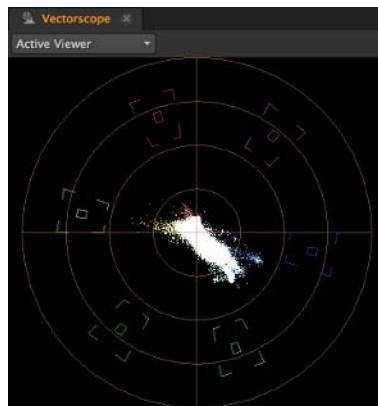


Figure 6.1: Normal saturation.

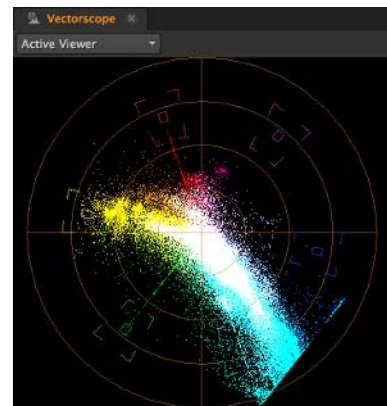


Figure 6.2: High Saturation.

There is also a **Viewer** selection control on the **Vectorscope** tab:

- **Viewer selection**—if you have multiple Viewers open, use the dropdown menu to associate Vectorscope output to the required clip. The default value, **Active Viewer**, automatically displays details on the last Viewer you selected.

## About Anamorphic Media

The Viewer automatically recognises anamorphic clips and displays them with the correct aspect ratio.

If for any reason you want to display an anamorphic clip with a 1:1 aspect ratio, right-click in the Viewer displaying the clip and enable the **Ignore**

Pixel Aspect checkbox, or use the **Shift+Ctrl/Cmd+P** hotkeys.



## About RED Media

When working with RED clips, using a RED Rocket card can increase the rendering speed significantly, especially at higher resolutions.



**NOTE:** The RED Rocket icon is only visible if you have a RED Rocket installed.

The RED Rocket icon has three states:



**Inactive**—the RED Rocket card is inactive.



**Firmware error**—there is a problem with the card firmware. Hover the mouse over the icon for more information.



**Active**—the RED Rocket card is present and active.

To modify the RED Rocket options:

1. Click the  icon in the **Viewer**.



**NOTE:** You must have **Use RED Rocket** enabled in the **Preferences** dialog to access these options. See [Workspace Preferences](#) for more information.

The **RED Rocket Settings** dialog displays.



2. Temporarily disable the RED Rocket card by deselecting **Use RED Rocket card**. Unlike the option in the **Preferences** dialog, changing this setting does not affect the application at startup.
3. Click **OK** to save your settings.



**NOTE:** Projects containing large amounts of movie files (for example **.r3d** and **.mov**) may exceed the number of available file handles per process, causing problems opening new files or projects and exporting.

You can increase the default limit of 1024 by entering the following command from the terminal, then running Hiero from the same session:

```
ulimit -Sn 2048
```

## Using RMD Look Files

RED metadata files, or RMDs, are designed to contain grade information for R3D clips. You can automatically create RMDs for all files, or create RMDs manually for specific clips. RMDs reside in the same folder as the source R3D clip.

### Automatic RMDs

The **Preferences** dialog contains an option to automatically create RMDs for files as you make changes to the RED Look.



**NOTE:** When **Automatically save RMD files** is enabled, all changes you make to RED Look settings are added to the RMD file, overwriting any metadata that was present.

To enable Automatic RMDs:

1. Navigate to **Hiero (HieroPlayer) > Preferences > General (OS X)** or **Edit > Preferences > General (Linux and Windows)**,  
OR  
Use the **Preferences** hotkeys **Ctrl/Cmd+,** (comma).  
The **Preferences** dialog box displays.
2. Select **Automatically save RMD files** and click **OK**.

### Manual RMDs

Sometimes in your workflow, it's not practical to constantly save RMDs for all your clips. You can create individual RMDs using the **Media** tab.

1. Modify the RED Look parameters as required.
2. Right-click in the **Media** tab **Effect** panel and select **Clip Options > Save RMD**.

An RMD file is created in the same folder as the source clip.

### Syncing to VBlank

Hiero and HieroPlayer automatically account for tearing that can occur due to NVIDIA and OpenGL issues on Linux, but with dual screen setups, you need to specify which screen to synchronise. The `_GL_SYNC_DISPLAY_DEVICE` environment variable enables you to specify the synch device by appending the screen device name to the variable.

To determine your screen names:

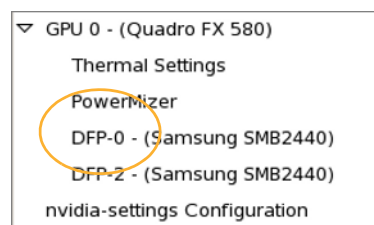
1. From the console, enter:

```
nvidia-settings
```

The **NVIDIA X Server Settings** dialog box displays.



2. Open up the **GPU** dropdown to display the screen device names.



3. Make a note of the device names, for example, **DFP-0** or **CRT-1**.

Set the `_GL_SYNC_DISPLAY_DEVICE` environment variable value to the device name as described in [Setting Environment Variables](#).

## 7 USING TAGS

Tags are used to mark shots of a particular type or content as you organise your project. The default tags supplied include **Approved**, **Notes**, **Reference**, and other general purpose tags. You can also create custom tags by right-clicking in the **Tags** tab or by pressing **Ctrl/Cmd + Y**. You can apply tags to clips, track items, individual frames, sequences, and tracks.

Clip and track item tags and notes can be added to exports using Hiero's burn-in feature. See [Adding Burn-in Text to Exports](#) for more information.

### Using Quick Tags

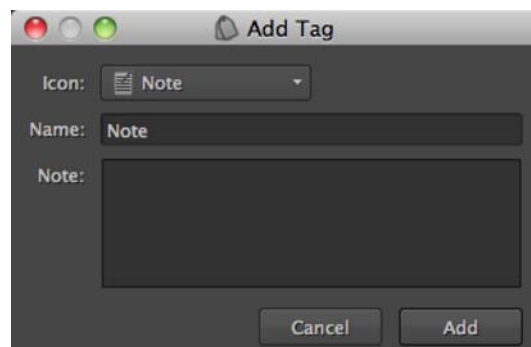
Quick tags allow you to add tags, depending on context, by right-clicking a selection and then choosing the type of tag to apply. If you're tagging a large amount of media, you might find it more convenient to use the drag-and-drop methods described later on.

Quick tags are accessible from bins, spreadsheets, Viewers, and timelines for single or multiple selections.

1. Select the target clips or sequences.
2. Right-click a highlighted selection, go to **Tags**, and choose the required action, dependent on context.

For example, bin items only allow you to **Tag Selection**, whereas track items allow you to **Tag Shot Selection**, **Tag Tracks**, or **Tag this Sequence**

Once you've selected the tag type, the **Add Tag** dialog displays.



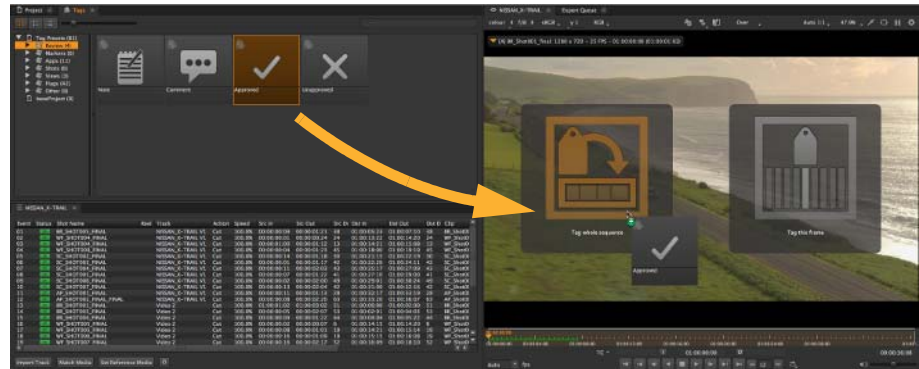
3. Select the icon to represent the tag using the **Icon** dropdown.
4. Enter a **Name** and **Note** as required.
5. Click **Add** to mark your selections with the chosen tag.

See [Creating Custom Tags](#) and [Removing Tags](#) for more information.

## Tagging Using the Viewer

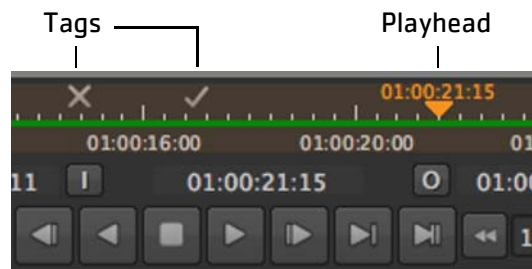
To apply a tag using the Viewer:

1. Click the **Tags** tab, or navigate to **Window > Tags**. The **Tags** tab displays.
2. Drag-and-drop the required tag from the **Tags** tab to the Viewer.



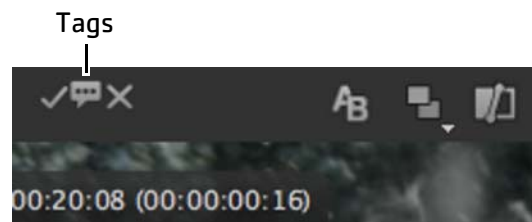
Depending on whether you're looking at a clip or sequence, drop the tag on **Tag this frame**, **Tag whole clip**, or **Tag whole sequence** as required.

Tags applied to frames appear above the playback tools in the Viewer timeline.



**TIP:** Use **Alt+Shift+,** (comma) or **.** (full stop) to skip to the previous or next tag on the current clip or reposition tags by dragging them along the Viewer timeline.

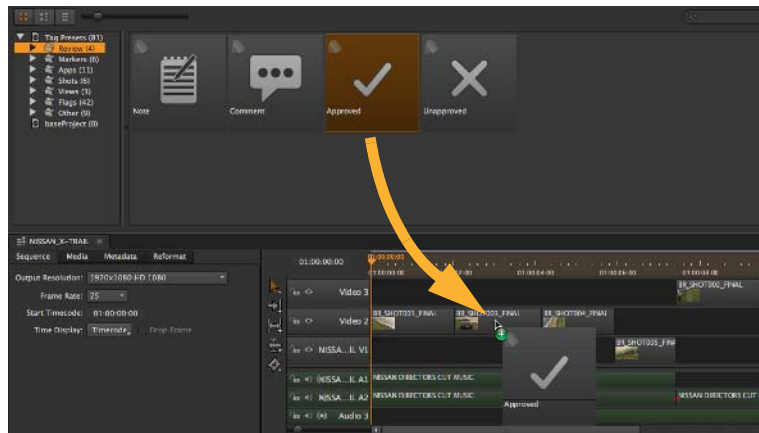
Tags applied to entire clips or sequences appear above the Viewer, next to the **A/B layout** dropdown menu.



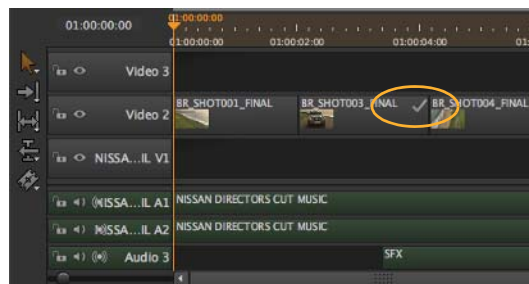
## Tagging Track Items

To apply a tag to a track item on the timeline:

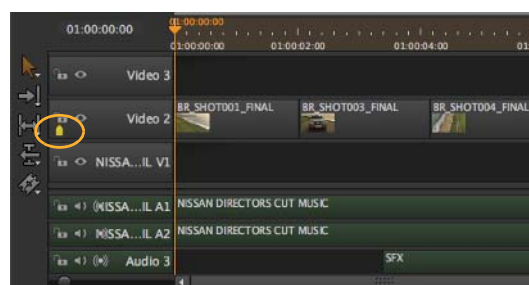
1. Click the **Tags** tab, or navigate to **Window > Tags**.  
 The **Tags** tab displays.
2. Drag-and-drop the required tag from the **Tags** tab to the timeline.  
 Depending on where the tag is dropped, you'll mark a track item (or items if you make multiple selections) or a track.



Tags applied to track items appear on the right of the selected item(s) on the timeline.



Tags applied to tracks appear in the track header on the left of the timeline.



## Adding Notes to Tags

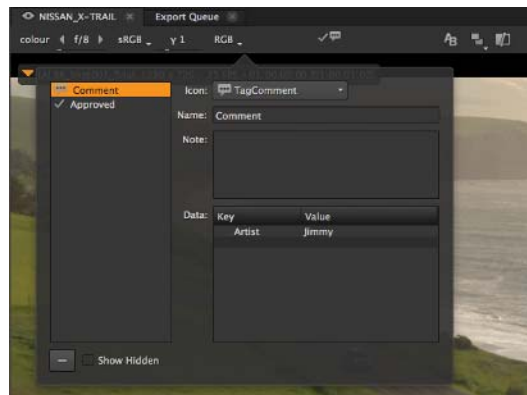
In some cases, a simple tag on a frame or clip may not contain all the information that you wish to pass on to the next stage of production. Adding notes to a tag can provide that extra detail.



**NOTE:** To delete a note, don't click the - button because this refers to the tag. Instead, simply delete the notes in the window and click outside the note dialog.

1. Add notes to tags by clicking on the required tag and entering text or editing the metadata keys and values.

The example shows a note and metadata key "Artist" added to a clip tag, but you can add notes to frame and timeline tags in the same way.



2. Click outside the dialog to save the note.

Hiero and HieroPlayer allow you to "hide" tags using the Python API. Hidden tags are not displayed in the interface, unless you enable **Show Hidden** in the Tags popup, but the notes and metadata are still accessible.



Navigate to **Help > Python Dev Guide** for more information.

## Filtering and Flagging Media Using Tags

You can search for clips containing certain tags, for example, if you wanted to find all clips that you tagged as **Approved**.

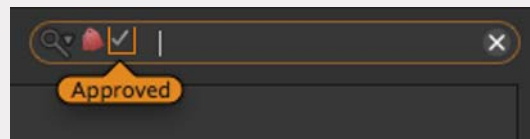
There are two types of tag search you can perform: **Filter** and **Flag**. Select the desired search type by clicking the magnifier icon in the **Project** tab.

- **Filter**—displays all objects that contain the specified tag. This is the default search method.
- **Flag**—displays all objects and marks the items that don't match the search tag.

Drag the required tag from the **Tags** tab into the search box and select the bin or bins you want to Filter or Flag.



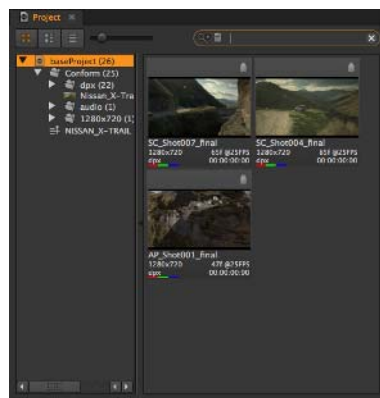
**TIP:** If you have more than one search criteria, click the icons in the search box to display a brief description of the icons.



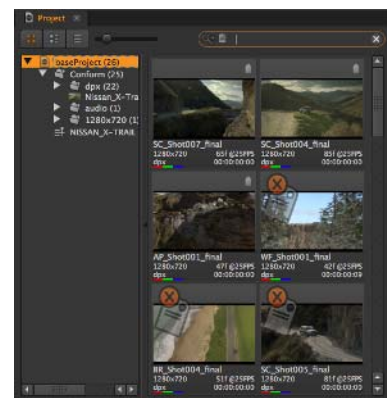
Filters and flags persist until you change the search criteria or click the icon in the search box.



The following examples show **Filtering** a bin to display only clips with the **Notes** tag applied and **Flagging** all clips that don't have the **Notes** tag applied.



Filtering...



...and Flagging

## Creating Custom Tags

You may find that you require a specific tag or suite of tags that are not provided by default. Creating custom tags allows you to really control the organisation of your media, and you can even create your own tag icons.



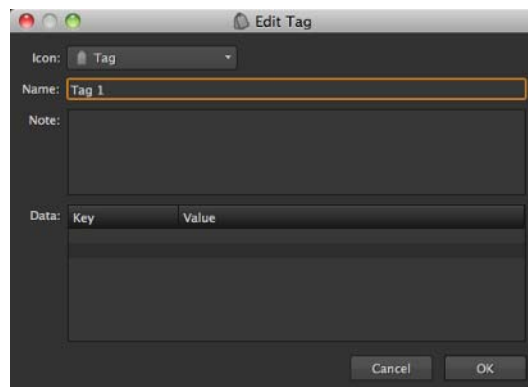
**NOTE:** Custom tags can only be created in the **Tags** tab.

To create a custom tag:

1. Click the **Tags** tab, or navigate to **Window > Tags**.
2. Select your project and navigate to **Project > New Tag**, or press **Ctrl/Cmd + Y**.

The new tag is placed in the selected project.

3. Double-click the tag to open the **Edit Tag** dialog box.



4. Click the **Icon** dropdown menu to select an icon for the custom tag.

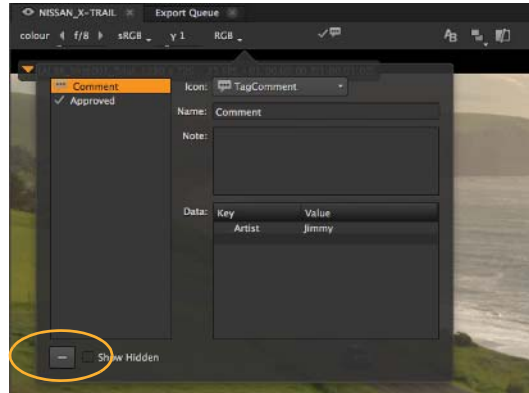


**TIP:** You can import your own image for the tag by selecting **Custom** to open the browser.

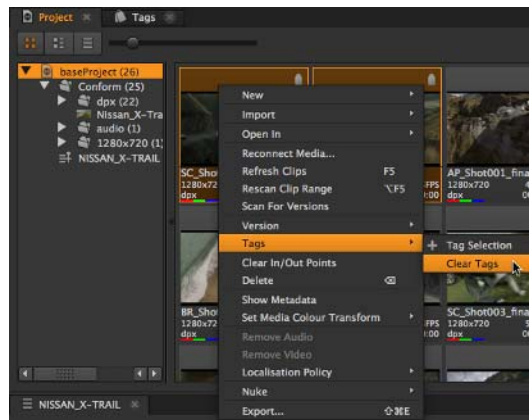
5. Enter a description for the tag in the **Name** field.
6. Click **OK** to save your changes.

## Removing Tags


To remove a tag from a frame or clip, click the tag and then click .



You can remove all tags from a clip or selection of clips by right-clicking your selections in the bin and choosing **Tags > Clear Tags**.



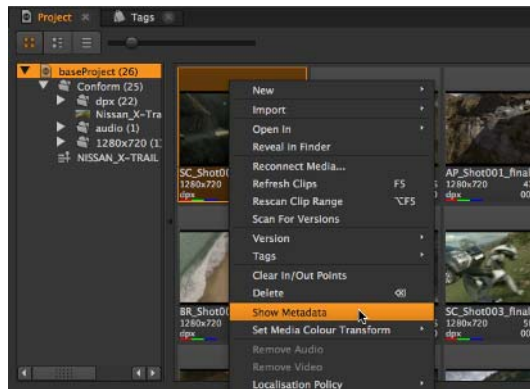
To remove a tag from a track or track item, click on a tag icon and select the required tag to remove.

Press  to remove your selection.

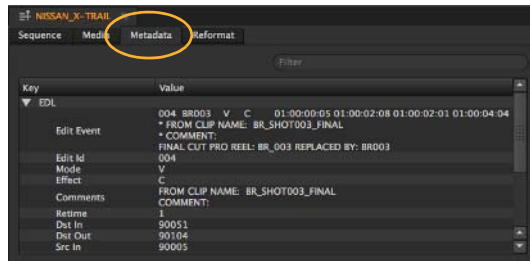
## 8 VIEWING METADATA

Metadata is information that describes media content, separate from the clip itself, in the form of a table on the **Metadata** tab. Types of metadata include **Duration**, **File Size**, and the **Path** to the location of the source media.

To view metadata for a bin clip, right-click the clip and select **Show Metadata**.



To view metadata for a track item, select the **Metadata** tab in the timeline pane and click on the item to examine.



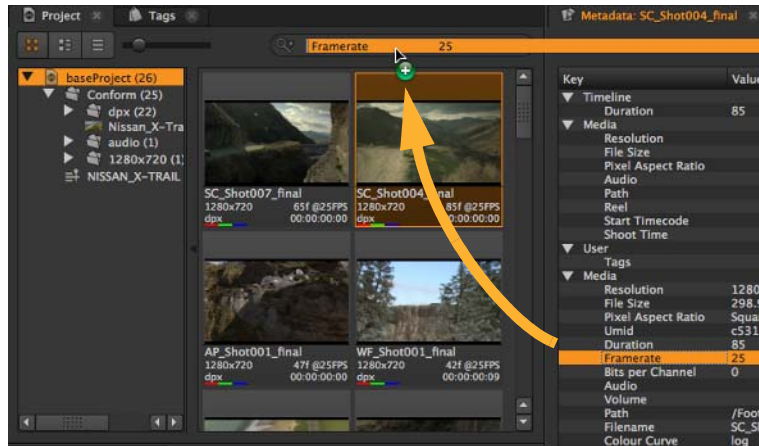
### Filtering and Flagging Media Using Metadata

If searching your project using tags has not filtered your media effectively, you can search for clips containing certain metadata. For example, if you wanted to find all clips that had a particular resolution or framerate.

To filter or flag using metadata:

1. Right-click the clip that contains the required metadata key and select **Show Metadata**.

2. Drag-and-drop the required key from the **Metadata** pane to the bin view search box.



3. Use the metadata key as a filter or flag as described in [Filtering and Flagging Media Using Tags](#).

## 9 CONFORMING USING HIERO

Hiero accepts sequences either from edit decision lists (EDLs) or Final Cut Pro XML files from a specified directory structure containing the source media files. Hiero attempts to conform the media, warning you if there are missing media.

Hiero conforms EDLs into single tracks, and XMLs into multi-track timelines. You can either conform into a brand new timeline, or into an existing timeline by adding new tracks. For example, when conforming multiple EDLs into the same timeline, you would add new tracks for each EDL sequence conformed.



**NOTE:** HieroPlayer does not support any Conforming functionality. If you need to work on conformed sequences in HieroPlayer, import a Hiero project and select **File > Save as Player Project** to make it editable in HieroPlayer.

### Project Settings

A good place to start work is by defining default **Project Settings** before importing sequences, particularly in the case of EDLs as they may not contain framerate information. **Project Settings** only apply to the current project and override **Preferences** settings.

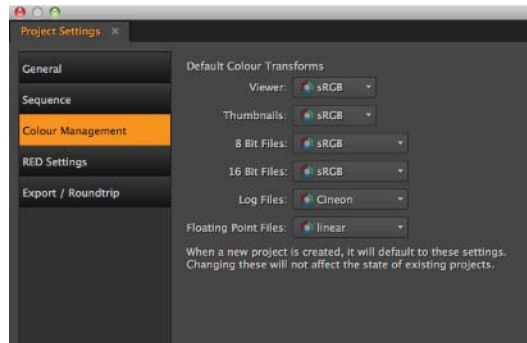


**NOTE:** You can modify **Project Settings** later on, for example, when you're ingesting media.

To define Project Settings in Hiero or HieroPlayer:

1. Navigate to **Project > Edit Settings**.  
The **Project Settings** dialog displays.
2. Click the **General** submenu to set the project **Name**.
3. Click the **Sequence** submenu to set the default timeline **Output Resolution, Framerate, and Start Timecode**.

4. Click the **Colour Management** submenu to manage the display and file colourspaces for the project.



5. Use the dropdown menus to define how clips in the Viewer, thumbnails, and so on are displayed.
6. Check **Use OCIO nodes when exporting in Nuke** to force Nuke to use the LUTs read from the OCIO config file specified in Hiero or HieroPlayer, rather than the Nuke native LUTs. This adds the relevant OCIO nodes to the script on a per project basis.

Enable this option in the **Preferences** to apply it to all new projects.

7. Click the **RED Settings** submenu to define the **Default Video Decode Mode** for R3D files.

The dropdown contains a sliding resolution scale from **Full Res Premium** to **Sixteenth Res Good**, but bear in mind that higher resolutions are slower to decode.

8. Lastly, click the **Export/Roundtrip** submenu to create the locked **Project Shot Template** in the **Export** dialog.

Hiero and HieroPlayer rely on this locked template when you select **Open in Nuke**. For more information on shot templates and tokens, see [Using the Shot Template](#).



**NOTE:** HieroPlayer is limited to editing the **External Media Track Name** as there is no support for creating shot templates in HieroPlayer. You cannot use **Open in Nuke** if the project was created in HieroPlayer.

You might also consider setting performance, caching, and localisation behaviour at this point, though the defaults may suit your purposes:

- **Performance**—sets the number of threads used for disk reads and decoding, either globally or on a per format basis. See [Optimising Read and Decode Performance](#) for more information.
- **Playback cache size**—sets the percentage of total memory available for use as cache. See [Workspace Preferences](#) for more information.

- **Max localised files**—sets the maximum space available for localised caching. See [Caching Media Locally](#) for more information.
- **Localise from and to**—sets the working directory that is automatically cached on ingest and the local directory where cached files are stored. See [Caching Media Locally](#) for more information.

## Importing Sequences

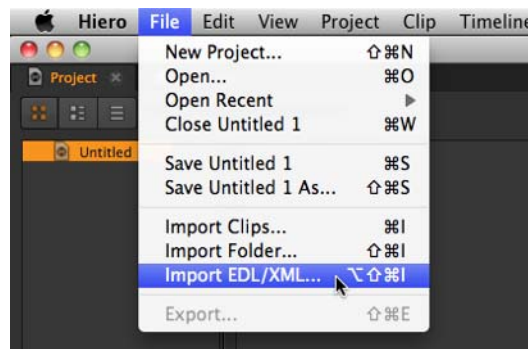
Hiero allows you to import your EDL or XML sequences in one of two ways, depending on your preferences.



**NOTE:** HieroPlayer does not support importing sequences.

If you're a menu-orientated user:

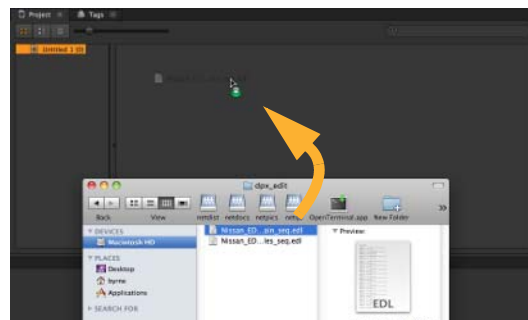
1. Navigate to **File > Import EDL/XML** and use the browser to locate the EDL or XML.



2. Select the file and click **Open** to import the sequence.

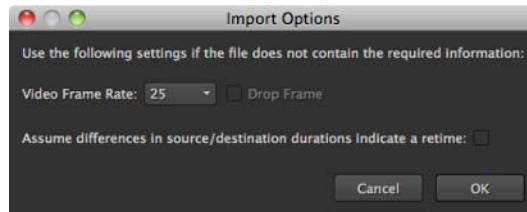
If you're a more hands-on user:

Drag-and-drop the EDL or XML files directly from a file browser into Hiero.



- If you're importing an EDL, bear in mind that there is no guaranteed framerate information included in the file.

When you import EDLs, an **Import Options** dialog displays.



- Select the correct frame and use the following check boxes, if required:
  - **Drop Frame**—when enabled, the EDL is assumed to contain drop frame information. See [Playback Tools](#) for more information.
  - **Assume differences in source/destination durations indicate a retime**—when enabled, any disparity between the source clip (Src) and track item (Dst) duration is treated as a retime.
- Click **OK** to import.

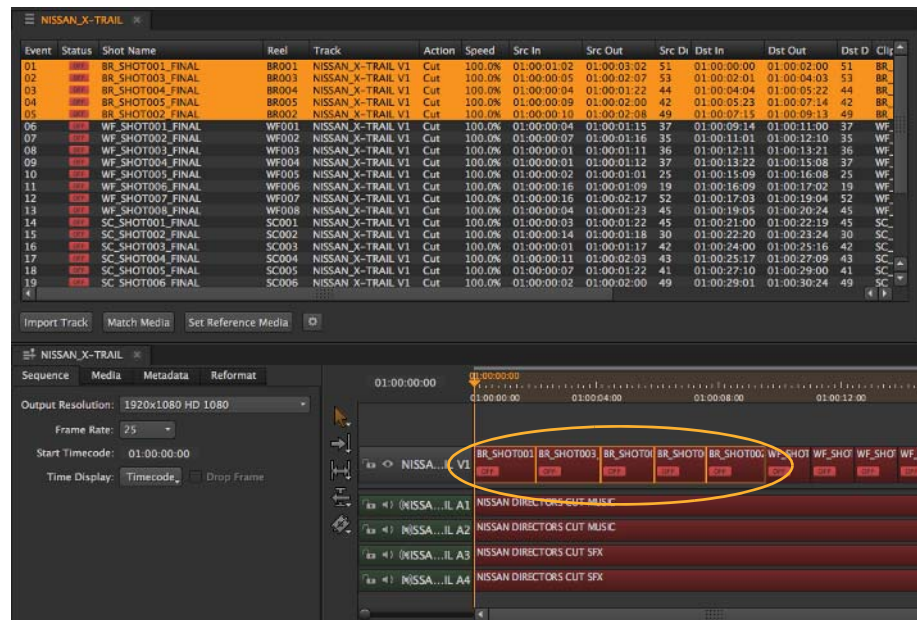
After importing the EDL or XML, the **Conforming** workspace displays and the spreadsheet and timeline are populated with offline clips—media with an unknown location.



**NOTE:** The **Event** column represents the clip's position on the timeline, not its event number from the EDL.

Event	Status	Shot Name	Reel	Track	Action	Speed	Src In
01		BR_SHOT001_FINAL	BR001	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:01:03
02		BR_SHOT003_FINAL	BR003	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:05
03		BR_SHOT004_FINAL	BR004	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:04
04		BR_SHOT005_FINAL	BR005	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:09
05		BR_SHOT002_FINAL	BR002	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:10
06		WF_SHOT001_FINAL	WF001	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:04
07		WF_SHOT002_FINAL	WF002	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:07
08		WF_SHOT003_FINAL	WF003	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:01
09		WF_SHOT004_FINAL	WF004	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:01
10		WF_SHOT005_FINAL	WF005	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:02
11		WF_SHOT006_FINAL	WF006	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:16
12		WF_SHOT007_FINAL	WF007	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:16
13		WF_SHOT008_FINAL	WF008	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:04
14		SC_SHOT001_FINAL	SC001	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:03
15		SC_SHOT002_FINAL	SC002	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:14
16		SC_SHOT003_FINAL	SC003	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:01
17		SC_SHOT004_FINAL	SC004	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:11
18		SC_SHOT005_FINAL	SC005	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:07
19		SC_SHOT006_FINAL	SC006	NISSAN_X-TRAB.V1	Cut	100.0%	01:00:00:02
20							

Notice that clicking entries in the spreadsheet highlights the corresponding track items on the timeline?



The spreadsheet, timeline, and Viewer are linked together when viewing sequences. If suitable screen real estate exists within the current workspace, double-clicking a sequence forces the associated panes to open automatically. You can also close all three panes by holding the **Alt** modifier while closing one of the linked panes.



**NOTE:** If you imported an XML sequence, you may find that Hiero has automatically matched media for you.

## Conforming Sequences

Once your EDLs or XML sequence are imported, it's time to begin the conform process to match the offline track items in your spreadsheet with the source clips on disk. You can conform sequences by searching on disk or by pre-ingesting the required clips into Hiero.



**NOTE:** Projects containing large amounts of movie files (for example **.r3d** and **.mov**) may exceed the number of available file handles per process, causing problems opening new files or projects and exporting.

You can increase the default limit of 1024 by entering the following command from the terminal, then running Hiero from the same session:

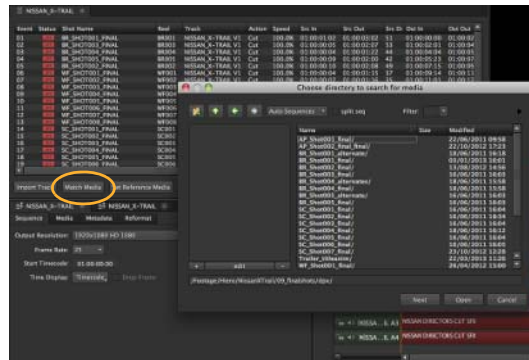
```
ulimit -Sn 2048
```



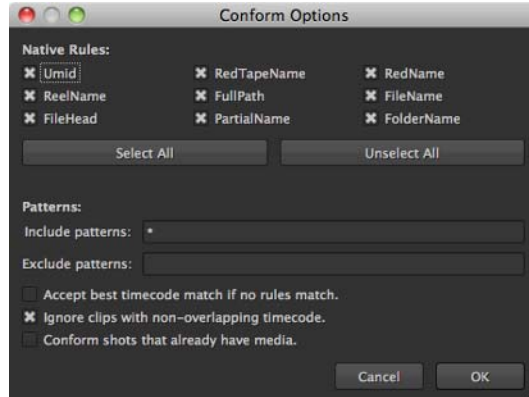
**NOTE:** HieroPlayer does not support conforming sequences.

## Conforming Using the Browser

1. After importing a sequence, click **Match Media** on the spreadsheet and use the browser to locate the source folder containing the correct media.



2. Click **Open** to display the **Conform Options** dialog box.



Hiero uses a set of conform **Rules** and file name **Patterns** to match candidate media files on disk to the events, or track items, in a sequence:

- **Rules**—sets the offline media properties to match to the corresponding spreadsheet entry during conform.

Rules that rely on information that doesn't exist in the event or candidate clip are ignored, and some rules compound others to identify a better match.

Rule	Description
Umid	Match a file's unique material ID (UMID) to the candidate media's UMID. If either, or both, lack a UMID this rule is ignored.
RedTapeName	Match a RED-style camera reel name from the event to the candidate media name.
RedName	Look for a RED-style camera file name in the event that matches the candidate media name.
ReelName	Look for the event's reel name in the candidate's media name.
FullPath	Match the event's entire filepath to the candidate media's entire filepath.
FileName	Match only the event's file name (no path) to the candidate media's file name.
FileHead	Match the event's file name head (no path, file extension, or padding) to the candidate media's file name.
PartialName	Look for the event's name in the candidate media's name and vice-versa.
FolderName	Look for the event's name in the filepath of the candidate media.

All rules are enabled by default, but you may occasionally need to disable rules if they cause incorrect matches between a particular edit and set of source clips.



**TIP:** Use the **Select/Deselect All** buttons to quickly enable or disable rules.

- **Patterns**—sets the inclusion and exclusion parameters during the conform, separated by spaces. For example, **\*mov \*dpx** would only include or exclude MOV and DPX files.

You could also conform by name, such as **BR\_Shot\***, which would only include or exclude source clip names starting with that string.

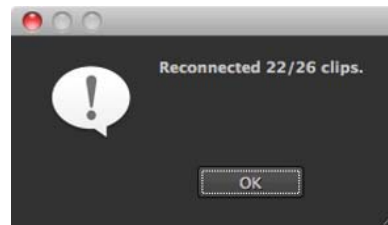


**TIP:** It's always a good idea to be as specific as possible with search locations during conforms, but if the need arises, conform **Rules** and **Patterns** can save time.

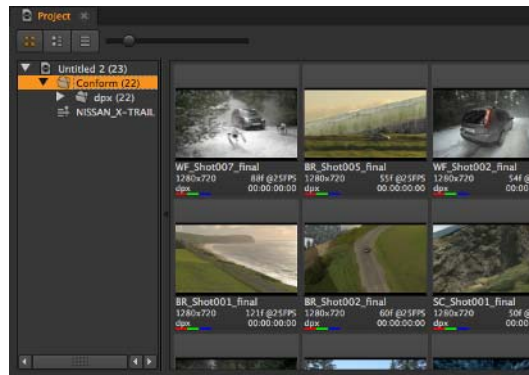
3. Enable **Accept best timecode match...** to use the nearest source timecode match to conform the event, if no rules are matched.
4. When **Ignore clips with non-overlapping timecodes** is enabled, any potentially matching source clip whose timecode doesn't overlap the track item in question at all is ignored.

5. Check **Conform shots that already have media** if you want to update all timeline track items. By default, Hiero doesn't try to conform events that are not offline.
6. Click **OK** to begin the conform process.

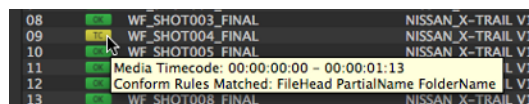
Hiero attempts to conform the EDL or XML with the selected media. A dialog box informs you of the success rate once the conform is complete.



Successfully matched media is placed in a new **Conform** bin in the project.



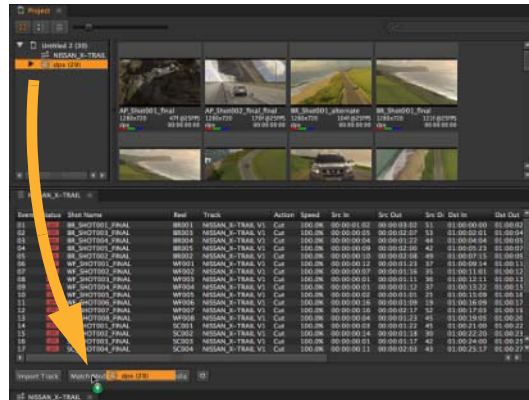
**NOTE:** You can display the conform Rules matched for each spreadsheet object by hovering the cursor over the required entry.



## Conforming with Pre-ingested Media

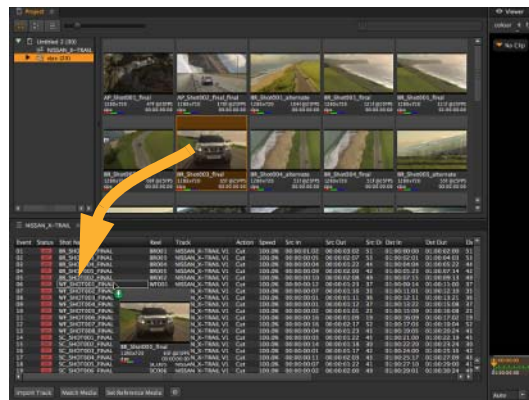
1. If your source media has been ingested into Hiero, you can drag-and-drop media from the bin view onto the **Match Media** button.

See [Ingesting Media](#) for information on getting media into Hiero.



2. Follow the **Conform Options** instructions on [page 87](#) to complete the conform process.

If you want to conform a single entry in the spreadsheet, drag-and-drop the media from the bin view onto the required entry in the spreadsheet.






Conforming individual, pre-ingested media doesn't require **Conform Options** because Hiero already knows the exact location of the media and trusts the decision to replace a track item.

## About the Media Spreadsheet

All events in a sequence are displayed in an easy to read format in the spreadsheet including status, the track it resides on, length, and the source file location.

After conforming, you can use the spreadsheet to locate bin clips or replace track items in the timeline, as well as message timecodes if they are invalid.

The media spreadsheet displays each entry's current media state:

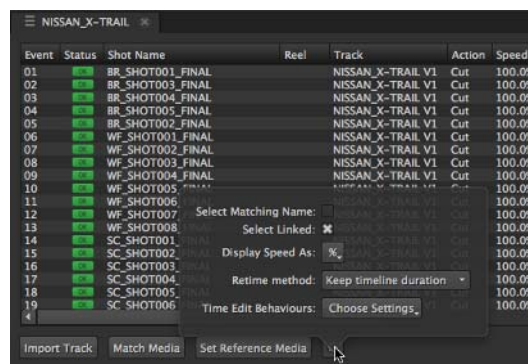
- —the media was successfully conformed and its timecode is correct.
- —the media was successfully conformed, but the timecode is currently incorrect.
- —the media could not be conformed.



**NOTE:** Any source or destination field highlighted in yellow indicates that the entry has been rounded down for display purposes.

See [Managing Timelines](#) for more information on importing tracks and reference media.

There are also a number of controls, accessed by clicking the cog icon, that determine the spreadsheet's appearance and behaviour:

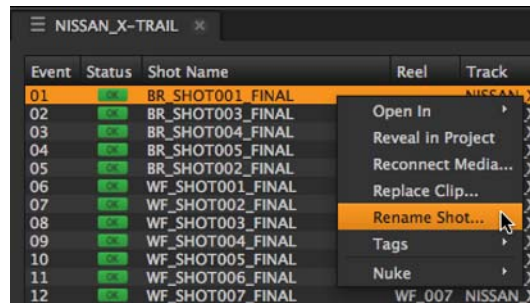


- **Select Matching Name**—when enabled, selecting an item in the spreadsheet highlights all items with the same name.
- **Select Linked**—when enabled, selecting an item in the spreadsheet highlights other items linked to it, such as audio tracks ingested with video tracks.
- **Display Speed As**—sets the unit used in the Speed column of the spreadsheet. Select either **fps** (frames per second) or **%** (the percentage of the media framerate).
- **Retime method**—sets the type of **Speed** retime applied on the timeline.
- **Time Edit Behaviours**—sets how source and destination **In**, **Out**, and **Duration** are calculated.

See [Retiming Clips](#) for more information on retime methods and [Timeline Editing Tools](#) for source/destination calculations.

You can locate, display, reconnect, or rename track items directly from the spreadsheet.

- Hold **Alt** and click an entry to move the playhead to the track item's **In** point on the timeline.
- Hold **Alt** and double-click an entry to move the playhead to the track item's **In** point on the timeline and zoom to fit the timeline view.
- Right-click a spreadsheet entry and select the required option:



- **Open In**—the associated bin clip opens in the selected location, such as a Viewer.
- **Reveal in Project**—the associated clip is highlighted in the bin view.
- **Reconnect Media**—Hiero attempts to reconnect the media from a specified location on disk, such as when the source was originally on a drive that is no longer connected.
- **Replace Clip(s)**—replaces the selected entry with a specified source clip. Hiero assumes that any source clip you choose is acceptable, regardless of timecode.
- **Rename Shot**—displays the **Rename Shots** dialog for all selected entries. See [Renaming Shots on the Timeline](#) for more information.
- **Tags**—allows you to add tags to your selection directly from the spreadsheet view. See [Using Quick Tags](#) for more information.
- **Nuke**—provides access to the Hiero<>Nuke functionality directly from the spreadsheet. See [Round-Tripping Using Hiero<>Nuke](#) for more information.

## Adjusting Timecodes

You can easily adjust single or multiple event timecodes:


1. Select the invalid entry or entries in the spreadsheet.
2. Double-click in the **Src In** column.
3. Adjust the timecode as required. You can enter **absolute** or **relative** timecode values:

- **Absolute**—absolute timecodes contain eight digits and specify the new timecode for the event, regardless of the current timecode.

Example	Result
01:05:43:21	Sets the timecode at 1 hour, 05 minutes, 43 seconds, and 21 frames
01054321	

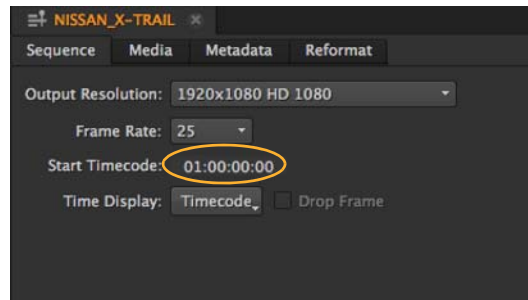
- **Relative**—uses + and - values to alter the timecode relative to its current value. You can also use **h**, **m**, and **s** to denote hours, minutes, and seconds.

Current Position	Example	Result
01:05:43:21	+1h	02:05:43:21
	-110	01:05:42:11
	+10000	01:06:43:21
	-6m	00:59:43:21

The media changes state to .

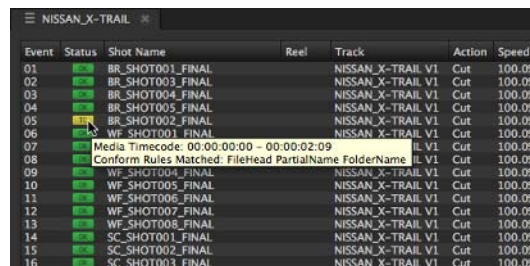


**NOTE:** Timelines start at 01:00:00:00 by default, but you can change this to any value using the **Sequence** tab.



If you're not sure what the timecode should be, you can:

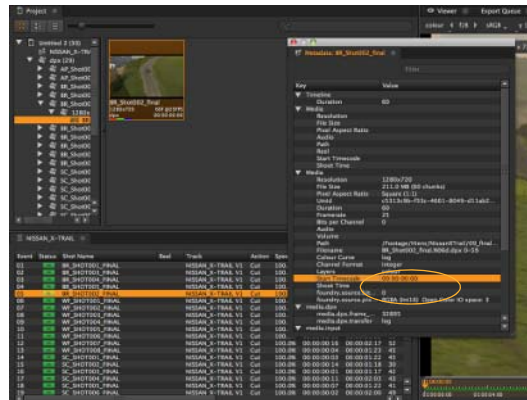
- Hover the mouse over the target entry in the spreadsheet to view a timecode tooltip.



OR

- Examine the bin clip’s metadata and calculate the correct **Src In**:
  1. Right-click the required entry and select **Reveal in Project**.
  2. Right-click the clip in the bin and select **Show Metadata**.

The selected clip metadata is displayed in a floating pane.



## Renaming Shots on the Timeline

Once you’ve conformed your EDL or XML, you may want to rename track items on the timeline sequentially for clarity.

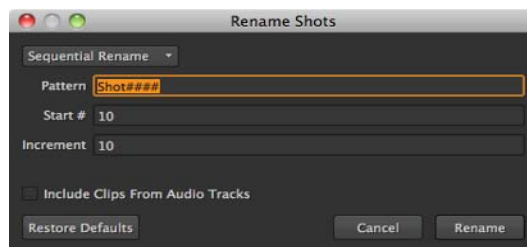


**NOTE:** If you need to work on conformed sequences in HieroPlayer, import a Hiero project and select **File > Save as Player Project** to make it editable in HieroPlayer.

To rename track items:

1. Select the track items to rename using the timeline or spreadsheet view.
2. Right-click on the timeline or spreadsheet and select **Rename Shots**.

The **Rename Shots** dialog displays.



3. Select the rename type from the dropdown:

- **Sequential Rename**—rename shots sequentially using the **Pattern**, **Start #**, and **Increment** fields.
- **Find and Replace**—a simple find and replace shot name. All selected shots containing the specified **Find** pattern are substituted with the **Replace** pattern.
- **Simple Rename**—all shots are replaced by the **New Name** specified.
- **Match Sequence**—allows you to select a sequence to copy shot names from, providing that they use the same track items. For example, renaming track items on a 30 second timeline to mirror the shot names from a 60 second timeline.



**NOTE:** You can only use sequences that reside in the same project and track items that have overlapping frame ranges.

- **Clip Name**—all shot names are replaced by the name of the source clip they reference. This option can be used to revert previous rename operation.
4. Rename operations also accept token substitutions. The following tokens are recognised:

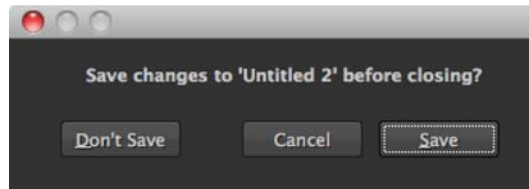
Token	Resolves to
{clip}	The name of the source clip referenced by the target track item.
{event}	The EDL event number associated with the target track item.
{fps}	The framerate of the sequence containing the rename target.
{sequence}	The name of the sequence containing the rename target.
{shot}	The name of the track item.
{track}	The name of the track containing the rename target.

5. Enable **Include Clips From Audio Tracks** to rename audio track items as well as video track items.
6. Click **Rename**.  
The selected track items are renamed as specified.

## Saving and Loading Projects

You can save your work as a Hiero or HieroPlayer project using the **.hrox** file extension.

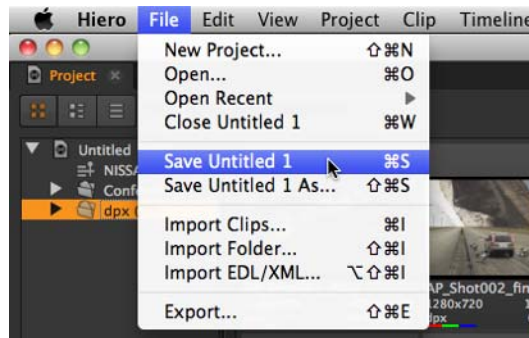
If you quit the application without saving, you'll be prompted to save or discard your changes:



Click the required button or press **D** for **Don't Save** or **S** to **Save**.

To save a project:

1. Navigate to **File > Save Untitled 1** or **Save Untitled 1 As...**



OR

Use the **Ctrl/Cmd+S** or **Shift+Ctrl/Cmd+S** hotkeys respectively.

The **Save Project** dialog box displays.

2. Browse to the save location and enter a name for the project.
3. Click **Save**.

Hiero saves your project to the location specified and appends the **.hrox** file extension automatically.



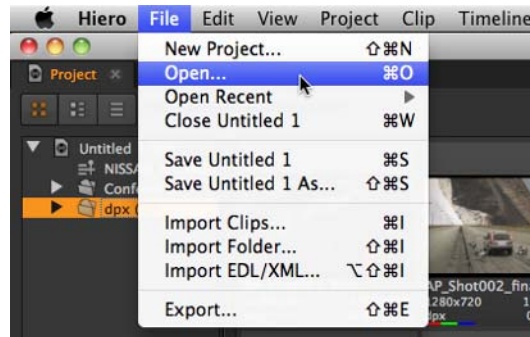
**NOTE:** Projects saved in Hiero are read only when loaded into HieroPlayer. If you want to edit Hiero **.hrox** files in HieroPlayer, use the **File > Save As Player Project** function to create a copy.

To load a project:

1. Navigate to **File > Open**.



**TIP:** If you need to open a project that you worked on recently, you can select **Open Recent** to quickly locate your work.



OR

Use the **Ctrl/Cmd+O** hotkeys.

The **Open Project** dialog box displays.

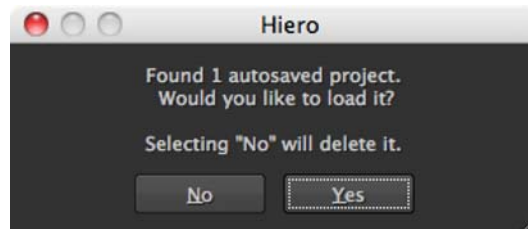
2. Browse to the file location and click **Open**.

Hiero opens your project and populates the necessary panes automatically.

## Autosaved Projects

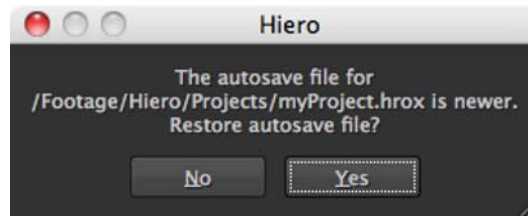
The autosave function creates a temporary save file at 5 minute intervals, but you can adjust the **Autosave period** in the **Preferences** dialog. See [Workspace Preferences](#) for more information.

At startup, the application scans for autosaved projects and displays a prompt if autosaves exist.



Click **Yes** to load the autosave or **No** to ignore and delete it.

Opening a project also uses the autosave functionality. If the autosave is more recent than the saved project file, a prompt displays:



Click **Yes** to load the autosave file or **No** to load the original project file.



**NOTE:** Clicking **No** does not delete the autosaved project in this case.

## 10 MANAGING TIMELINES

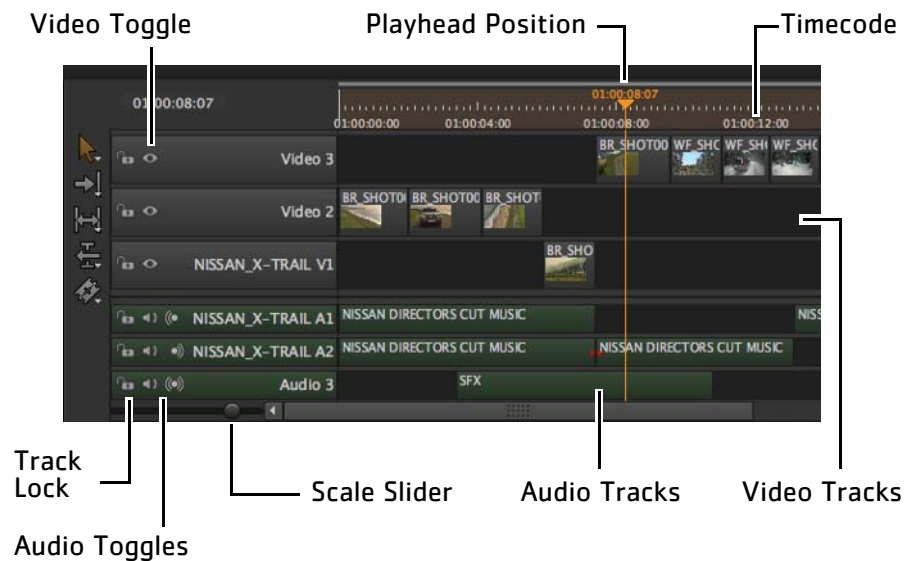
Timelines can contain any number of video sequences and audio tracks with each track containing track items that reference the source clips in your project—making changes to track items in the timeline does not affect the original source clip.



**NOTE:** HieroPlayer does not allow you to edit read-only projects. If you need to edit an imported Hiero project, select **File > Save as Player Project** to make it editable in HieroPlayer.



**NOTE:** Conformed EDLs only support one video sequence. If you've created multiple EDLs from the same edit, you can add each one into the timeline using the right-click **Import New Tracks** menu or the **Import Track** button under the spreadsheet. See [Adding Tracks to the Timeline](#).



- **Video Toggle**—quickly turn off and on video tracks during playback.
- **Playhead Position**—displays the playhead location synchronised with the contents of the Viewer.
- **Timecode**—displays the timecode or frame number depending on the **Time Display** mode selected. You can adjust the scale using the Scale Slider or by using the mouse wheel.
- **Video Tracks**—contain all video sequences for the current timeline.
- **Audio Tracks**—contain all the audio clips for the current timeline.

- **Scale Slider**—adjusts the scale of the timeline. You can fit the contents of the timeline to the screen space available by pressing the **F** hotkey.
- **Audio Toggles**—quickly mute audio or set the track output during playback to left, right, or mono.
- **Track Lock**—secure the selected track to disable all editing tools.

Video tracks in multi-track timelines are read from the highest number track downward, for example Video 3, Video 2, Video 1. As a result, if video is present on track 3, video on track 2 in the same time slice is obscured.

In [Figure 10.1](#), although the playhead crosses clips on two video tracks, only the clip in Video 3 is displayed in the Viewer.

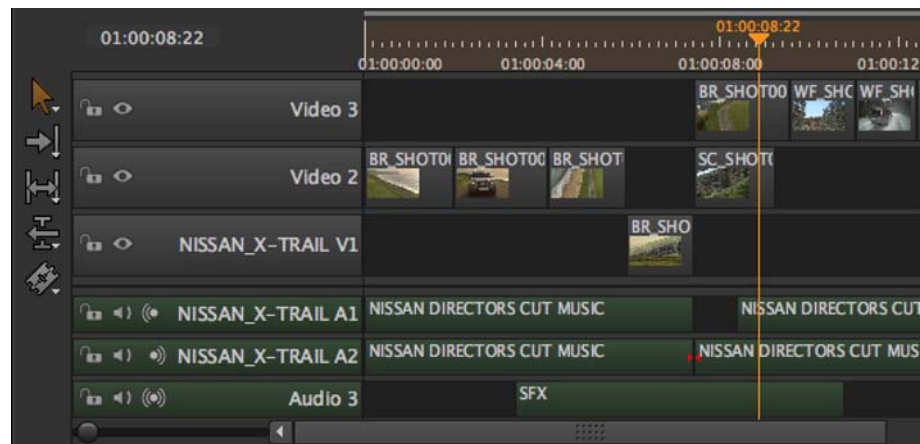


Figure 10.1: A typical multi-track timeline.

Audio tracks, on the other hand, can be played back simultaneously—all three audio tracks crossed by the playhead in [Figure 10.1](#) play back together, creating a complete audio backing for the video.

## Adding Tracks to the Timeline

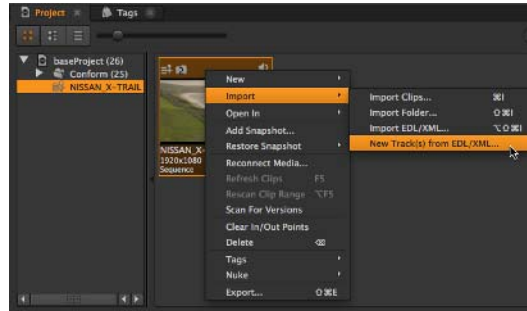
You can add empty tracks to existing timelines or import other EDLs or XML edits—effectively another sequence within the timeline.



**NOTE:** HieroPlayer cannot import EDLs or XMLs, but you can add scratch tracks to HieroPlayer projects or imported, read-only Hiero projects if you resave them using **File > Save as Player Project**.

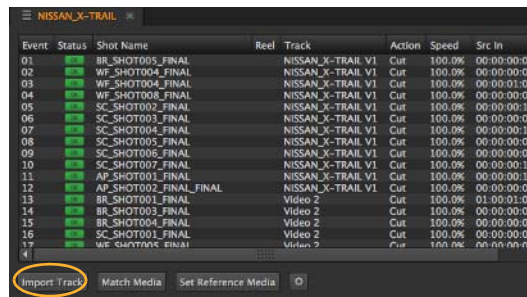
To import EDL or XML edits:

1. Select the required sequence in the project bin, right-click, and select **Import New Track(s) from EDL/XML**,



OR

2. Click **Import Track**.

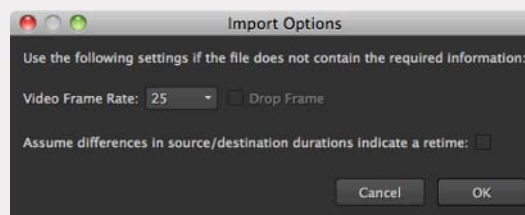


3. Use the browser to locate the EDL or XML files, select the file(s) and click **Open** to import the sequence.



**NOTE:** If you're importing a EDLs, bear in mind that there is no guaranteed framerate information included in the file.

When you import EDLs, an **Import Options** dialog displays.

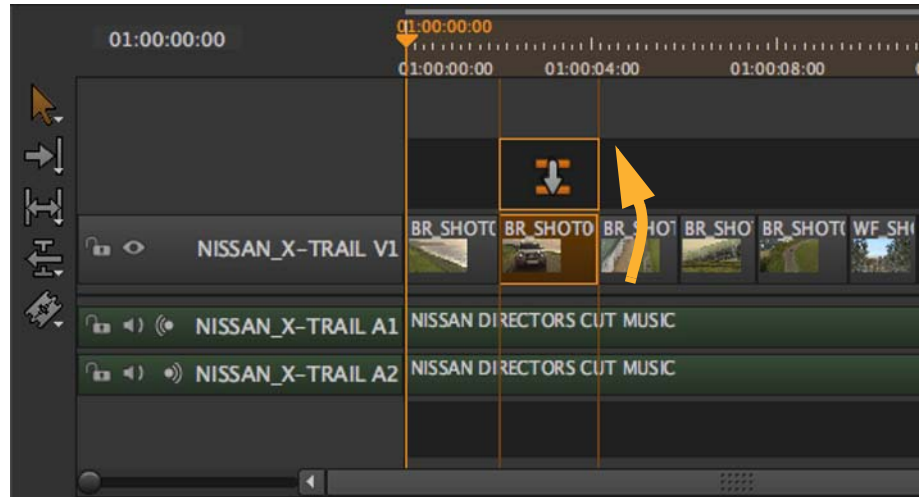


Select the correct **framerate** using the dropdown, then click **OK** to import.

4. Conform the new track as described in [Conforming Sequences](#).

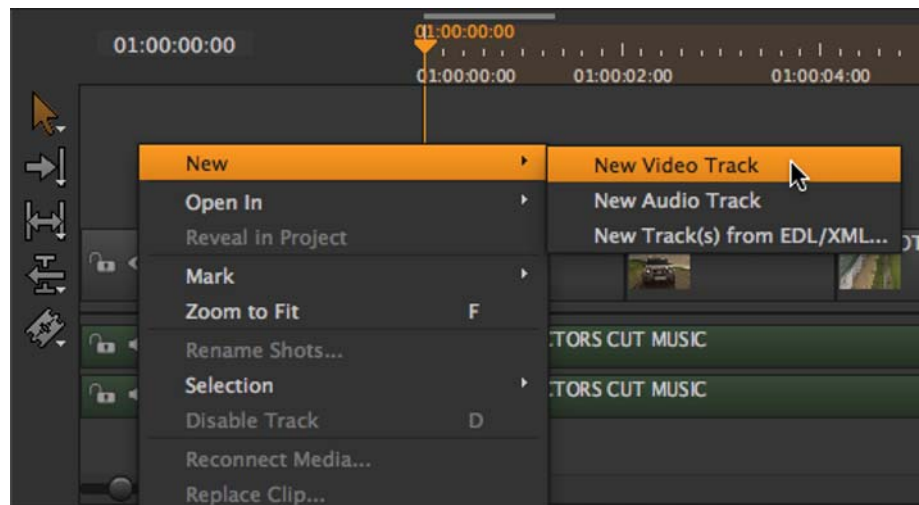
To add new tracks:

- Drag-and-drop a clip above or below existing tracks as shown,



OR

- Right-click in the timeline and select **New > New Video Track** or **New Audio Track**.



**NOTE:** You can also collapse and expand existing tracks using the right-click menu, and resize the track header to accommodate longer track names.

## Adding Clips to the Timeline

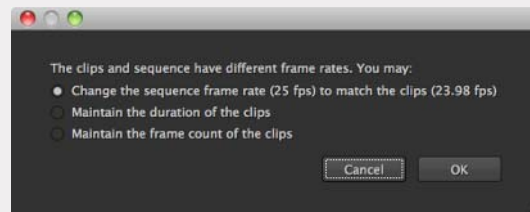
Hiero's timeline allows you to add clips by simple drag-and-drop from either the Viewer or bins. Using the Viewer restricts you to a single clip, the current clip, but you can drag as many clips as you like from bins.



**NOTE:** HieroPlayer does not allow you to edit read-only projects. If you need to edit an imported Hiero project, select **File > Save as Player Project** to make it editable in HieroPlayer.

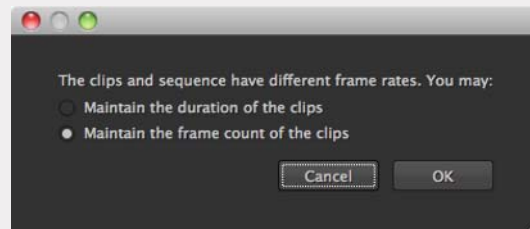


**NOTE:** New timelines pick up their framerate from the **Preferences > Sequence** dialog by default. Dropping a clip with a different framerate to the sequence preferences on a new timeline displays a warning:



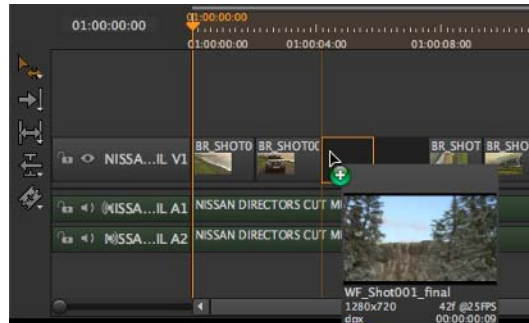
The timeline default framerate is set by the first clip added to it.

If the timeline is already populated and the clip you're adding doesn't have the same framerate as the timeline, you're prompted to choose whether the clip's duration or framerate is retained.



If the timeline already contains track items, take care not to overwrite existing items—the most recent clip overlays any existing track item. To avoid this, do one of the following:

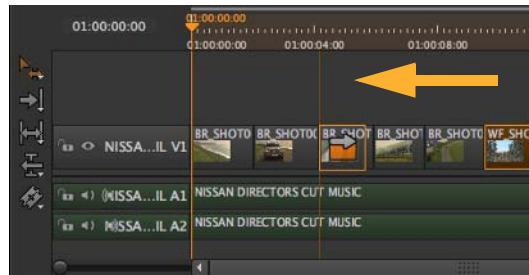
- Use the **Multi** or **Move/Trim** tools to make space for the new clip and then drag-and-drop it in to the space (see [Move/Trim Tool](#) for more information).





- Drag-and-drop the new clip at the end of the sequence, then using the **Multi** or **Move/Trim** tools, drag the new clip to an existing transition, hold down the **Alt** modifier, and drop the clip to **Ripple** all other track items down the timeline.



**TIP:** The cursor changes to  when you're using **Ripple** mode.



- Move the playhead to the target area of the timeline in the record Viewer , load the required clip in a source Viewer , and then use **Insert** (N) or **Overwrite** (M) to place the clip into the timeline at the playhead position on the lowest, unlocked track available.



**NOTE:** You can only **Insert** or **Overwrite** using clips from the current project.

You can also use 3-point editing to set the In and Out points on the timeline to specify where a clip should be inserted, instead of at the playhead's position:

- **No In/Out points set on the timeline**—insert or overwrite at the current playhead position, for the range currently set in the source Viewer.
- **In point but no Out point set on the timeline**—insert or overwrite at the In point position, for the range currently set in the source Viewer.
- **In and Out points set on the timeline**—insert or overwrite at the current In point position, for the duration set by the timeline's In and Out points. If there are insufficient source frames for the range specified, blank frames are added, highlighted in red.

## Audio and the Timeline

Audio tracks on the timeline are handled in much the same way as video tracks. By default, linked audio and video tracks are edited at the same time, but you can lock either track and move them independently or hold **Alt** to select a single track, if required.



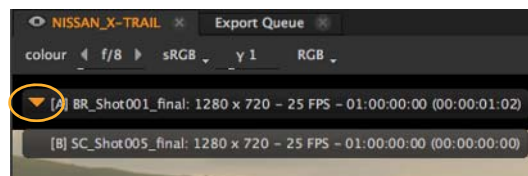
**NOTE:** Although you can import and edit multi-channel audio, during playback audio is mixed to 48 KHz stereo output.

Additionally, audio mixdown takes into account the total number of tracks present and averages the contribution of each to prevent clipping.

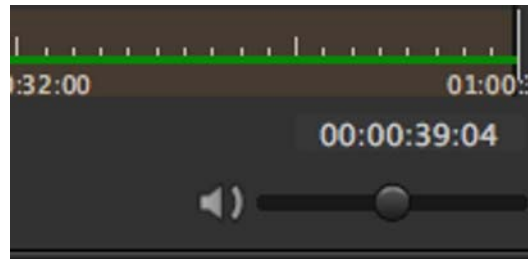


**NOTE:** Hiero and HieroPlayer do not currently support any QuickTime audio on Linux. Support for audio on Linux is scheduled for a later release.

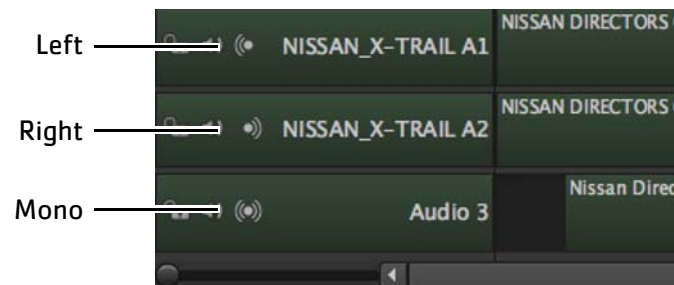
When both Viewer inputs contain clips, the audio output is set by the input marker on the overlays. In the following example, input A is providing the audio output:



The volume slider in the lower right corner of the Viewer controls the output level for that Viewer only.



Audio output for track items can be toggled between left, right, and mono using the audio toggles in the track header. Click on the icon to cycle between outputs:



The **Preferences** contain a toggle for audio, allowing you to enable and disable audio playback across the entire interface as well as control the volume level for all new Viewers. See [Workspace Preferences](#) for more information.



**NOTE:** If the framerate drops too low, audio is automatically muted and the speaker changes to the no audio playback icon.



## WAV Track Items

Audio can be recorded at the same time as shooting the video or it can be unrelated to the shoot, for example sound effects or music. You can add **.wav** clips to the timeline in two ways:

- **Drag-and-drop**—drag your **.wav** clip to a timeline audio track and drop it in to place.
- Navigate to **File > Import Clips** or **Import Folders**.



**TIP:** You can also use the **Ctrl/Cmd+I** and **Shift+Ctrl/Cmd+I** hotkeys.


Use the [Timeline Editing Tools](#) to move the clip into place and set its output.

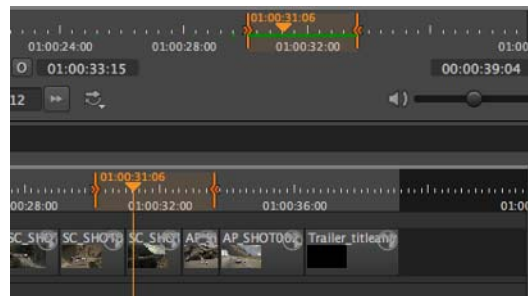
## Synchronising Audio and Video


Hiero and HieroPlayer allow you to massage the synchronisation between audio and video tracks using audio latency adjustment during playback in the Viewer, or by a default amount in the **Preferences > Audio** dialog.

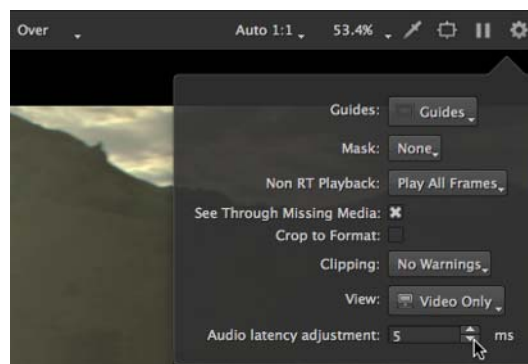


**NOTE:** Latency adjustments can take a few seconds to affect the audio track.

1. Mark a portion of the timeline containing the target audio and video track items using In and Out markers.
2. Press  or use the L hotkey to begin playback.



3. Click the Viewer settings icon and increment the latency using the controls in the popup. 



4. Adjust the latency until the tracks are in synch.

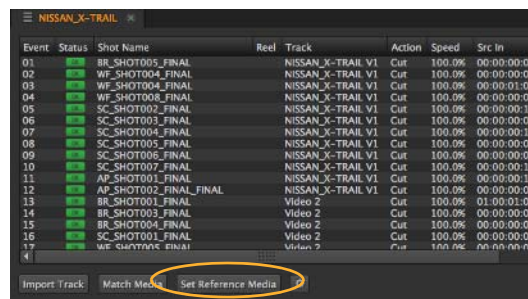
## Using Reference Media

Importing a lower resolution version of your timeline enables you to compare your current timeline against the reference media to avoid issues with continuity, missed frames, and so on.

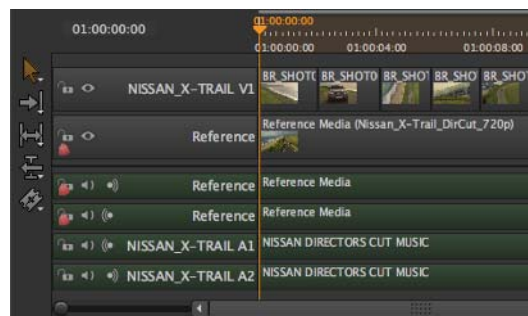
To import reference media, click **Set Reference Media** and use the browser to locate the required file.




**NOTE:** HieroPlayer does not support **Set Reference Media**, but you can import reference files manually and use A/B compare in the Viewer.



The reference media is automatically imported into **Reference** tracks, pushing existing tracks outward, and marked with the **Reference Media** tag.



After importing the reference media, use the show/hide icon  to compare the current timeline against the reference clip.

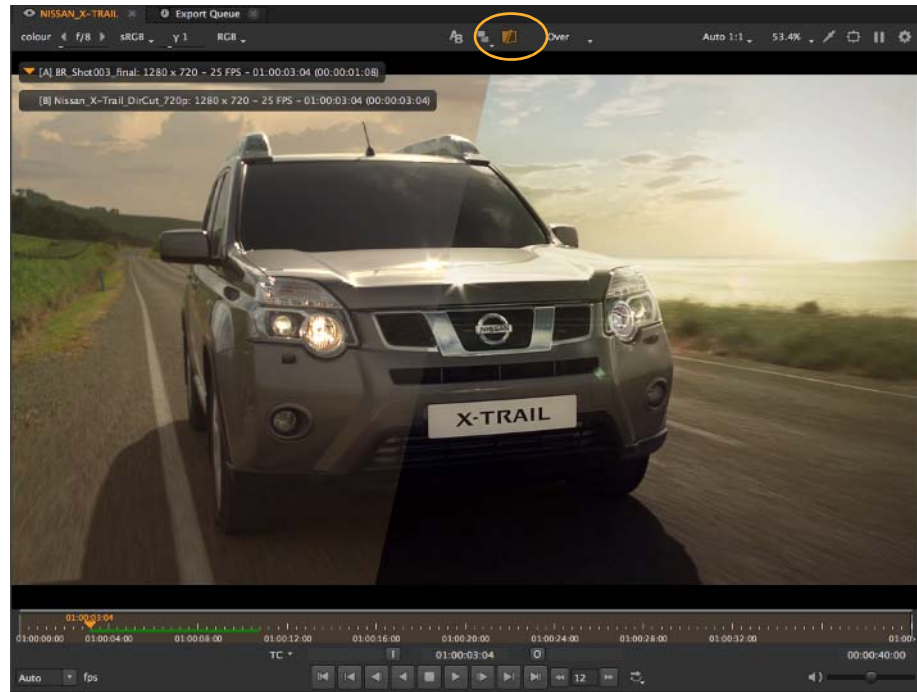
## Comparing Media


You can drag media from the bin view to the second Viewer input, and use

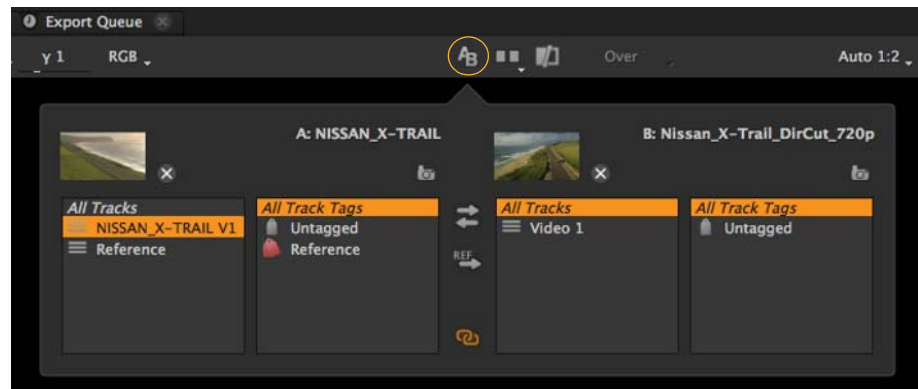
the **SplitWipe** tool to compare media.








**NOTE:** Hiero and HieroPlayer currently treat all alpha channels as premultiplied, which can result in the Viewer background being “added” to the image. If you’re working with un-premultiplied images, set the Viewer background to **Black**. See [Workspace Preferences](#) for more information.



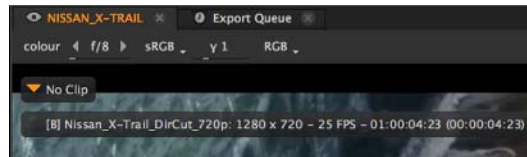
Alternatively, switch the Viewer to **Horizontal** mode and click the  button to determine the Viewer output using tracks flags and/or tags.



The following controls affect the A/B output:

Icon	Description
	Clear the associated Viewer input.
	Set the associated clip's thumbnail to the current frame.
	Swap the A and B inputs.
	Automatically places any tagged Reference media on the timeline in Viewer input B.
	Click to toggle A/B time synchronisation.

The Viewer overlay displays a description of the contents of the A and B inputs, or **No Clip** when there is no clip at the playhead, for instance, when there is a gap in a timeline.



The orange triangle in the A/B overlay denotes the clip currently supplying audio and timecode information in the Viewer.

## Viewing Multi-Format Timelines

Initially, sequences have an **Output Resolution** applied across all video tracks on a timeline. You can apply this resolution project-wide through **Project > Edit Settings > Sequence** or to individual sequences using the timeline **Sequence** tab.

In the real world, however, clips are often of different formats so Hiero and HieroPlayer provide clip-by-clip formatting options to help you standardise sequences more easily.

Reformatting applied to clips on a timeline carries over into any export from Hiero. The reformat options in the **Export** dialog are applied after the transforms applied here. See [Round-Tripping and Export Management](#) for

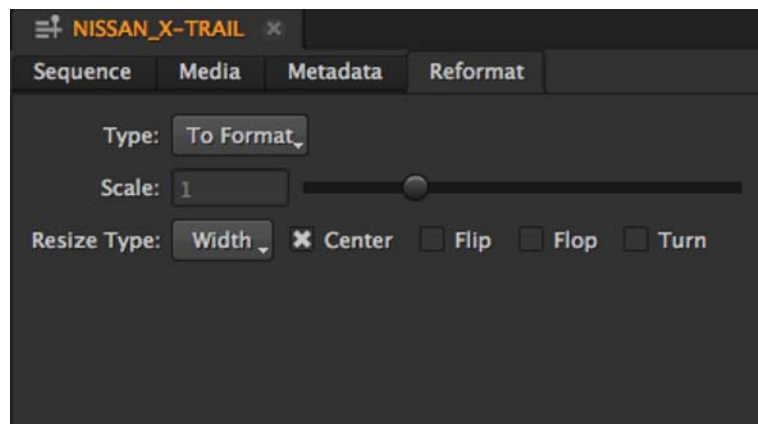
more information.



**NOTE:** Clips default to **Resize Type > Width** when you change the format of the sequence.

To apply format changes:

1. Select the clip(s) to reformat on the timeline.
2. Click the **Reformat** tab on the timeline pane to display the reformat options.



3. Select the reformat **Type** from the dropdown:
  - **Disabled**—no reformatting is applied.
  - **To Format**—enables the **Resize Type** and orientation controls.
  - **Scale**—enables the **Scale** controls.



**TIP:** You can enable the **Format** guide in the Viewer controls to overlay the current format as a red box.

4. **To Format** controls how a clip is resized and its orientation. The following **Resize Types** are supported:
  - **None**—no resize is applied.
  - **Width**—scale the original until its width matches the format's width. Height is then scaled to preserve the original aspect ratio.
  - **Height**—scale the original until its height matches the format's height. Width is then scaled to preserve the original aspect ratio.
  - **Fit**—scale the original until its smallest side matches the format's smallest side. The original's longer side is then scaled to preserve original aspect ratio.

- **Fill**—scale the original until its longest side matches the format’s longest side. The input’s shorter side is then scaled to preserve original aspect ratio.
- **Distort**—to scale the original until all its sides match the lengths specified by the format. This option does not preserve the original aspect ratio, so distortions may occur.

You can also change the clip orientation:

- **Centre**—centres the clip within the format dimensions.
  - **Flip**—flips the clip the X axis.
  - **Flop**—flops the clip on the Y axis.
  - **Turn**—rotates the clip 90 degrees clockwise.
5. **Scale** allows you to directly control the size of the clip without changing its aspect ratio.

Use the slider or enter a value in the field provided to scale the clip.

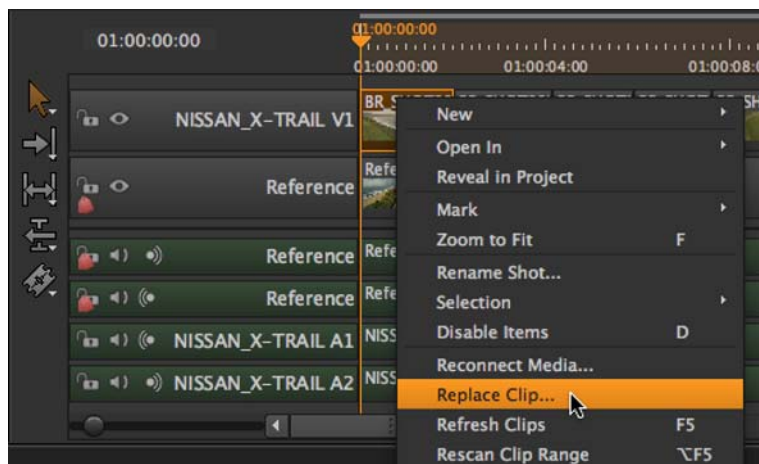
6. You can crop the clip outside the format by enabling **Crop to Format** in the Viewer controls.

## Refreshing and Replacing Track Items

During the post process, media inevitably changes location or form. Hiero can reload or replace your media using the refresh, rescan, reconnect, and replace functions.



**NOTE:** HieroPlayer cannot perform the **Replace Clip(s)** function on read-only projects.





the timeline is the active tab.



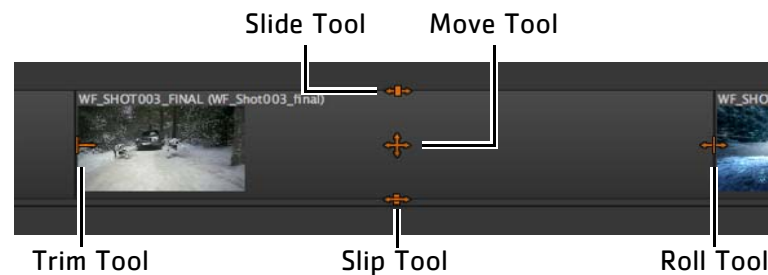
**NOTE:** For a full list of hotkeys, please see [Appendix A](#).

Pressing a hotkey multiple times selects the tools within each mode. For example, pressing **E** twice, rapidly in succession activates **Slide Clip**. Pressing them slowly in succession does not achieve the same result, but instead, remains on the first item in the menu. This allows you to activate a tool without knowing the current state of tool selection.

- mapped to **Q**, cycles through **Multi Tool**, **Move/Trim**, and **Select**.
- mapped to **W**, cycles through **Track Selection** tools.
- mapped to **E**, cycles through **Slip Clip** and **Slide Clip**.
- mapped to **R**, cycles through **Roll Edit**, **Ripple Edit**, and **Retime Clip**.
- mapped to **T**, cycles through **Razor**, **Razor All**, and **Join**.

## Using the Multi Tool

Unlike the other editing tools available in Hiero and HieroPlayer, the **Multi Tool** changes function depending on the position of your mouse in relation to the track item(s) selected.



The **Multi Tool**'s functionality is equivalent to most of the other tools combined, but doesn't require modal tool selection:

- **Move**—placing the mouse in the centre of a track item activates the tool. Drag the selected track item to the required position on the timeline.
- **Trim**—placing the mouse at the left or right of the track item activates the tool. Drag the edit point to the new position and release the mouse to complete the trim.  
See [Move/Trim Tool](#) for more information.
- **Select**—click-and-drag to marquee select clips. Hold **Shift** to add to your selection or **Alt** to subtract.  
See [Selection Tools](#) for more information.

- **Slip**—placing the mouse at the bottom of the track item activates the tool and displays the slip handles. Drag the track item to the new position and release the mouse to complete the slip.  
See [Slip Clip Tool](#) for more information.
- **Slide**—placing the mouse at the top of the track item activates the tool and displays the slide handles. Drag the track item to the new position and release the mouse to complete the slide.  
See [Slide Clip Tool](#) for more information.
- **Roll**—placing the mouse on the edit between track items activates the tool and displays the handles. Drag the edit to the new position and release the mouse to complete the roll.  
See [Roll Edit Tool](#) for more information.
- **Razor**—when using the Multi Tool, Razor cuts are menu driven. Navigate to **Timeline > Razor Selected** or **Razor All** to make cuts at the current playhead position.  
See [Razor and Join Tools](#) for more information.

## Move/Trim Tool

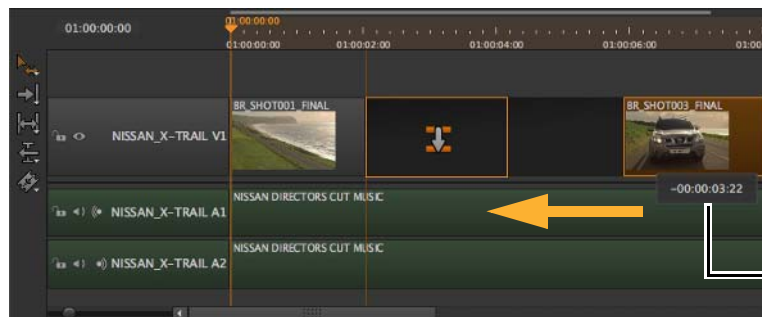
The **Move/Trim** tool allows you to manipulate the position of a track item or its output by adding or removing handles. Activate the **Move/Trim** tool by clicking the tool or pressing **Q** twice.

### To move track items:

Click and drag the selected track item(s) to the required position on the timeline. A time count popup, in conjunction with the snap to edit function, helps you to reposition the track item(s) accurately.



**NOTE:** The tool defaults to overwrite mode, indicated by the  cursor.



Time  
Count

You can also move track items up and down the track hierarchy using drag-

and-drop or the **Ctrl/Cmd+↑↓** hotkeys.



The following table describes the **Move/Trim** tool’s modifiers and actions:

Mode	Method	Indicator	Description
Overwrite	drag-and-drop		The default move mode. The dragged track item overwrites any items that are present in the move location.
Ripple	drag then hold <b>Alt</b> and drop		Drag-and-drop track items on top of other items without overwriting content—items are pushed down the timeline to accommodate the move.
Duplicate	hold <b>Alt</b> and drag then release <b>Alt</b> and drop		Copy the track item, then drag-and-drop on top of other items overwriting existing content—items are <b>not</b> pushed down the timeline to accommodate the move.
Ripple and Duplicate	hold <b>Alt</b> then drag and drop while holding <b>Alt</b>		Copy the track item, then drag-and-drop items on top of others without overwriting content—items are pushed down the timeline to accommodate the move.

**Note:** On Linux, hold **Ctrl+Alt** for **Duplicate** and **Ripple Duplicate** modifiers.

Action	Hotkeys	Description
Delete	<b>Backspace</b>	Delete the selected track item(s) or gap(s).
Ripple Delete	<b>Shift + Backspace</b>	Remove the selected track item(s) and ripple items down stream to close gaps in the timeline. <b>Note:</b> The ripple effect may not close gaps entirely, because Hiero does not allow linked tracks to become desynchronised during rippling.

If you need to nudge track items by just a frame or two, you can select the items on the timeline and press **Ctrl/Cmd+←→** to nudge by one frame in the chosen direction. Press **Ctrl/Cmd+Shift+←→** to nudge by the **Frame**

**Increment** set under the Viewer.



**NOTE:** You cannot overwrite other track items on the timeline using the nudge keys.

**To move track items using the spreadsheet view:**

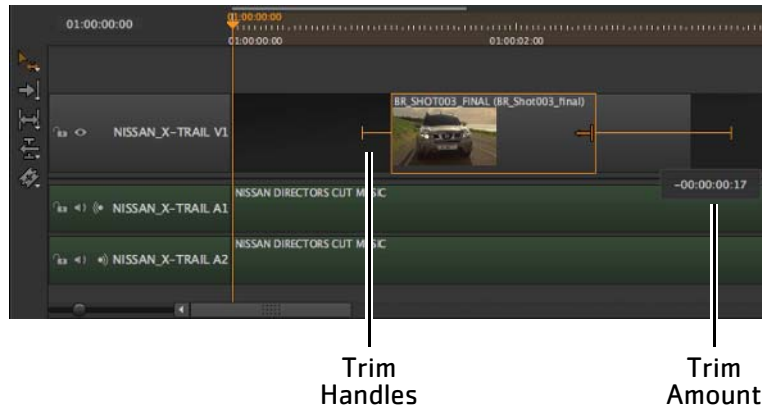
1. Select the required events in the spreadsheet view.
2. Click the cog icon and select the required **Time Edit Behaviours**:

Modify	Using	Result																												
<b>Dst In</b>	Move Destination	<p>Adjusts the event's <b>Dst In</b> and <b>Out</b> by the same amount, moving the track item's position on the timeline by the specified amount, while maintaining Speed.</p> <p>Before and after a 2 second <b>Dst In</b> increase:</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:02:00</td> <td>01:00:05:24</td> <td>100</td> </tr> </tbody> </table>	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:02:00	01:00:05:24	100
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100																								
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:04:00	100	01:00:02:00	01:00:05:24	100																								
<b>Dst Out</b>	Move Destination	<p>Adjusts the event's <b>Dst Out</b> and <b>In</b> by the same amount, moving the track item's position on the timeline by the specified amount, while maintaining Speed.</p> <p>Before and after a 2 second <b>Dst Out</b> increase:</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:02:00</td> <td>01:00:05:24</td> <td>100</td> </tr> </tbody> </table>	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:02:00	01:00:05:24	100
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100																								
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:04:00	100	01:00:02:00	01:00:05:24	100																								

3. Adjust the **Dst In** or **Dst Out** to move the track item(s) by the specified amount.

**To trim track items:**

Click-and-drag the edit point to the new position and release the mouse to complete the trim.



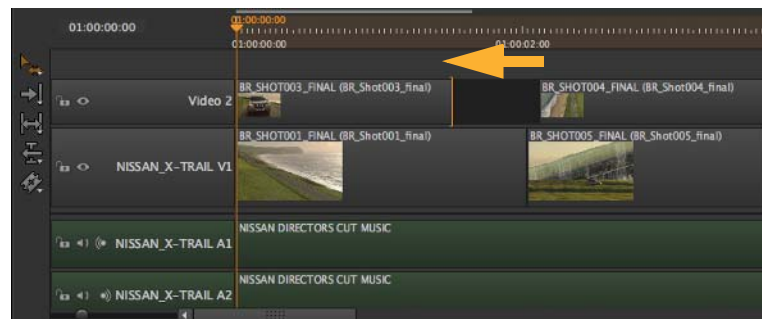
**NOTE:** Use the **Ripple Edit** tool, activated by pressing **R** twice, to ripple downstream track items automatically.

The Viewer displays the new In or Out point (depending on whether you're adjusting the beginning or end of the track item), allowing you to accurately gauge the new output.

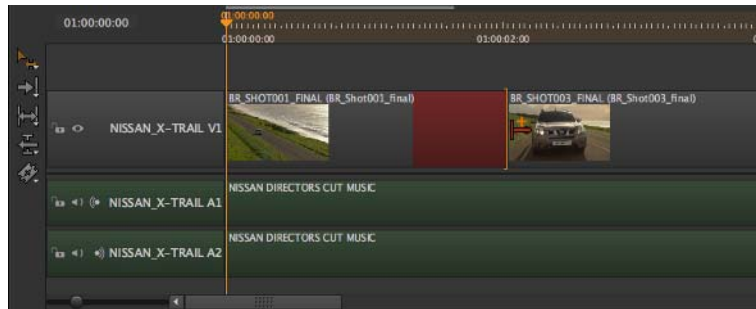


**NOTE:** Trimming multiple track items simultaneously trims each item by the same amount and in the same direction.

Alternatively, click an edit point and nudge the edit using the **Ctrl/Cmd+←→** keys or hold **Shift** to nudge by the **Frame Increment** set under the Viewer.



By holding **Ctrl/Cmd** and dragging an edit, you can add blank frames past the end of the track item's handles. Blank frames are coloured red on the timeline for clarity:



**To trim track items using the spreadsheet view:**

1. Select the required events in the spreadsheet view.
2. Click the cog icon and select the required **Time Edit Behaviours** depending on whether you're using the In or Out points or duration:

Modify	Using	Result																												
Src In	Trim In	<p>Trims the event's <b>Src In</b>, <b>Dst In</b>, and <b>durations</b> while maintaining speed.</p> <p>Before and after a 2 second <b>Src In</b> increase:</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:02:01</td> <td>00:00:04:00</td> <td>50</td> <td>01:00:02:00</td> <td>01:00:03:24</td> <td>50</td> </tr> </tbody> </table>	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:02:01	00:00:04:00	50	01:00:02:00	01:00:03:24	50
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100																								
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:02:01	00:00:04:00	50	01:00:02:00	01:00:03:24	50																								
Src Out	Trim Out	<p>Trims the event's <b>Src Out</b>, <b>Dst Out</b>, and <b>durations</b> while maintaining speed.</p> <p>Before and after a 2 second <b>Src Out</b> increase:</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:06:00</td> <td>150</td> <td>01:00:00:00</td> <td>01:00:05:24</td> <td>150</td> </tr> </tbody> </table>	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:06:00	150	01:00:00:00	01:00:05:24	150
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100																								
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:06:00	150	01:00:00:00	01:00:05:24	150																								
Src Dur	Trim Out	<p>Trims the event's <b>Src Dur</b>, <b>Dst Dur</b>, and <b>Src/Dst Out</b> while maintaining speed.</p> <p>Before and after a 50 frame <b>Src Dur</b> increase:</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:06:00</td> <td>150</td> <td>01:00:00:00</td> <td>01:00:05:24</td> <td>150</td> </tr> </tbody> </table>	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:06:00	150	01:00:00:00	01:00:05:24	150
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100																								
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:06:00	150	01:00:00:00	01:00:05:24	150																								

Modify	Using	Result																												
<b>Dst In</b>	Trim In	<p>Trims the event's <b>Dst In</b>, <b>Src In</b>, and <b>durations</b> while maintaining speed.</p> <p>Before and after a 2 second <b>Dst In</b> increase:</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:02:01</td> <td>00:00:04:00</td> <td>50</td> <td>01:00:02:00</td> <td>01:00:03:24</td> <td>50</td> </tr> </tbody> </table>	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:02:01	00:00:04:00	50	01:00:02:00	01:00:03:24	50
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100																								
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:02:01	00:00:04:00	50	01:00:02:00	01:00:03:24	50																								
<b>Dst Out</b>	Trim Out	<p>Trims the event's <b>Dst Out</b>, <b>Src Out</b>, and <b>durations</b> while maintaining speed.</p> <p>Before and after a 2 second <b>Dst Out</b> increase:</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:06:00</td> <td>150</td> <td>01:00:00:00</td> <td>01:00:05:24</td> <td>150</td> </tr> </tbody> </table>	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:06:00	150	01:00:00:00	01:00:05:24	150
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100																								
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:06:00	150	01:00:00:00	01:00:05:24	150																								
<b>Dst Dur</b>	Trim Out	<p>Trims the event's <b>Dst Dur</b>, <b>Src Dur</b>, and <b>Dst/Src Out</b> while maintaining speed.</p> <p>Before and after a 50 frame <b>Dst Dur</b> increase:</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:06:00</td> <td>150</td> <td>01:00:00:00</td> <td>01:00:05:24</td> <td>150</td> </tr> </tbody> </table>	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:06:00	150	01:00:00:00	01:00:05:24	150
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100																								
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:06:00	150	01:00:00:00	01:00:05:24	150																								

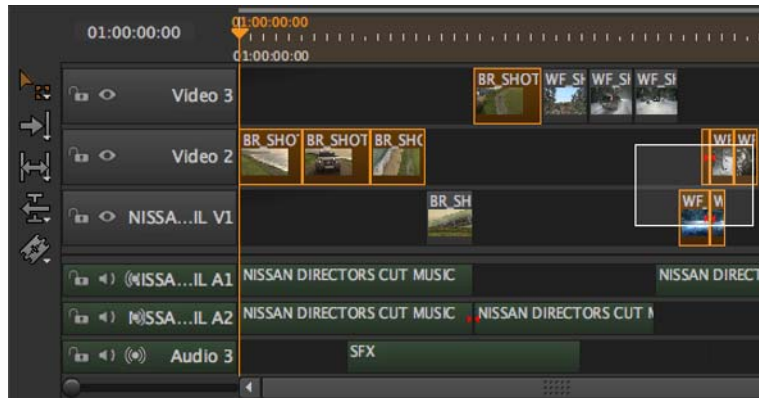
- Adjust the values as required to trim the track item(s) by the specified amount.

## Selection Tools

The timeline editing tools include a marquee selection tool and several context dependent track selection tools.

The marquee **Select** tool, activated by clicking the tool or pressing **Q** three times, allows you to make multiple selections quickly by lassoing track items.

Hold **Shift** to add to the selection and **Alt** to subtract from the selection.



The track selection tools, activated by clicking the tool or by pressing **W**, selects multiple items depending on the initial selection:

- **Select Track to Right** or **Left**—all track items right or left of the target track item are selected, within a single track.



- **Select All in Track**—all track items on the target track are selected.



- **Select All Tracks Right or Left**—all track items right or left of the target item are selected, regardless of which track they occupy.



## Slip Clip Tool

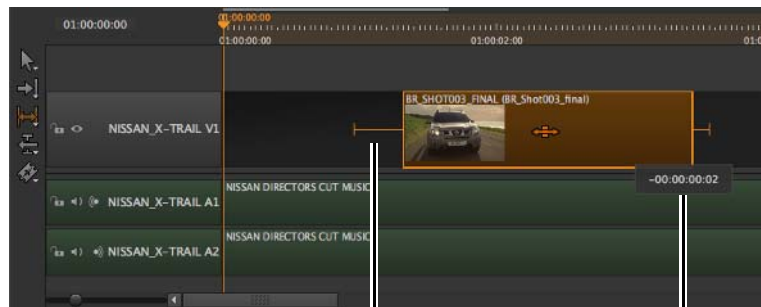
The **Slip Clip** tool allows you to shift a track item's In and Out points by the same amount and in the same direction, retaining the original duration but altering the timeline output. Activate the **Slip Clip** tool by clicking the tool or pressing **E**.



**NOTE:** The target track item must have handles to use the **Slip** tool.

The **Slip Clip** tool displays different Viewer previews depending on whether the playhead is on the target track item or not, but the basic principals are the same.

Click the target clip to display the available handles and then drag the track item to the new position. Release the mouse to complete the slip.



Slip  
Handle

Slip  
Amount

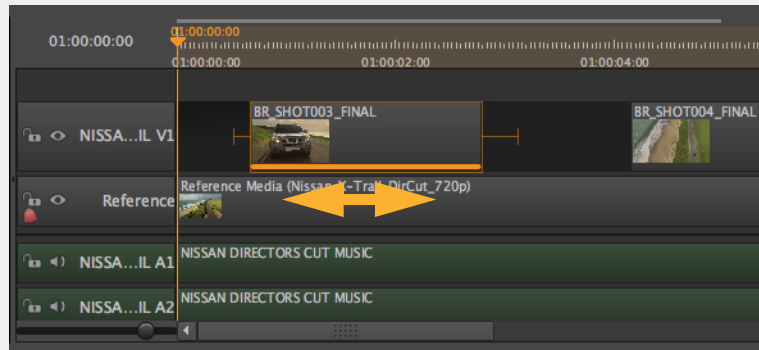


**NOTE:** Using the **Slip Clip** tool does not move the track item on the timeline, only the output is changed.

Alternatively, nudge the slip using the **Ctrl/Cmd+←→** keys or hold **Shift** to nudge by the **Frame Increment** set under the Viewer.



**NOTE:** If you're using the **Multi Tool**, you can nudge using the "slip bar" by clicking at the bottom the track item.

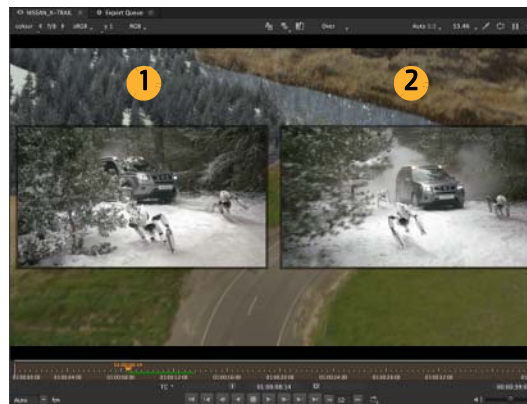


The following Viewer previews are displayed, depending on the playhead position:



**NOTE:** The Viewer background always displays the playhead's current position.

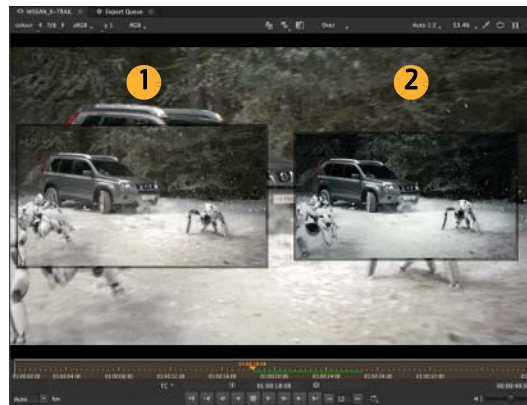
- When the playhead is not currently on the target track item, the Viewer displays the **In** frame (1) and **Out** frame (2), allowing you to accurately gauge the new output.



- When the playhead is on the target track item, the Viewer displays the **In** frame (1), the **current** frame (2), and **Out** frame (3), allowing you to accurately gauge the output of the track item against the current frame.



- When the playhead is on the target track item and A/B compare is active, the Viewer displays the target track item (1) and the reference track item (2), allowing you to synchronise your working track against the reference track.



### Slipping using the spreadsheet view

You can slip track items using the **Src In** and **Src Out** columns of the spreadsheet:

1. Select the required event in the spreadsheet view.

- Click the cog icon and select the required **Time Edit Behaviours** depending on whether you're using the In or Out point:

Modify	Using	Result																												
Src In	Slip Source	<p>Adjusts the <b>Src In</b> and <b>Src Out</b> by the same amount, slipping the event while maintaining speed.</p> <p>Before and after a 2 second <b>Src In</b> increase:</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:02:01</td> <td>00:00:06:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> </tbody> </table>	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:02:01	00:00:06:00	100	01:00:00:00	01:00:03:24	100
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100																								
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:02:01	00:00:06:00	100	01:00:00:00	01:00:03:24	100																								
Src Out	Slip Source	<p>Adjusts the <b>Src Out</b> and <b>Src In</b> by the same amount, slipping the event while maintaining speed.</p> <p>Before and after a 2 second <b>Src Out</b> increase:</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:02:01</td> <td>00:00:06:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> </tbody> </table>	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:02:01	00:00:06:00	100	01:00:00:00	01:00:03:24	100
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100																								
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:02:01	00:00:06:00	100	01:00:00:00	01:00:03:24	100																								

- Adjust the **Src In** or **Src Out** to slip the track item(s) by the specified amount.

## Slide Clip Tool

The Slide Clip tool allows you to move a track item in relation to the item before and/or after the target item, without changing its length or timeline output. Activate the **Slide Clip** tool by clicking the tool or pressing **E** twice.

The track item either side of the target are shortened or lengthened within the limits of their handles to accommodate the slide.



**NOTE:** The surrounding track items must have handles to use the **Slide** tool.

Click the target track item and then drag it to the new position and release the mouse to complete the slide.

For example, if you slide the target track item (2) five frames to the right, the preceding item (1) ends five frames later and the next item (3) starts five frames later.

[Figure 10.2](#) shows a timeline containing three track item, and [Figure 10.3](#) shows the same track items with the target (2) sliding to the right.

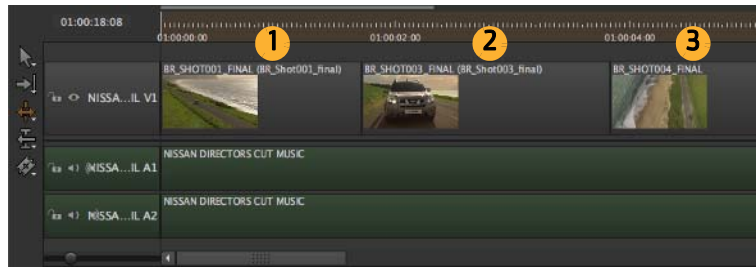


Figure 10.2: Original clips.

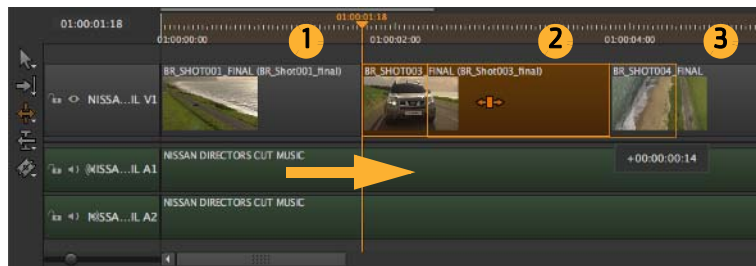


Figure 10.3: Post slide positions.

The Viewer displays the new end point of the previous track item on the left and the new start point of the next track item on the right, allowing you to accurately gauge the slide.

The two centre images (2) represent the start and end frames of the target track item, which don't change.



## Roll Edit Tool

The **Roll** tool enables you to roll a single edit within the available handles, shortening one track item while lengthening the other, but keeping the overall duration the same. Activate the **Roll Edit** tool by clicking the tool or pressing **R**.



**NOTE:** At least one of the target items must have handles to use the **Roll** tool.

1. Click an edit point between two track items to display the available handles as a red overlay.
2. Drag the edit to the new position and release the mouse to complete the roll.

For example, if you roll five frames at the end of one track item (1), the next item (2) starts five frames later. [Figure 10.4](#) shows a timeline containing two track items, and [Figure 10.5](#) shows the same items with the edit point “rolled” to the right.

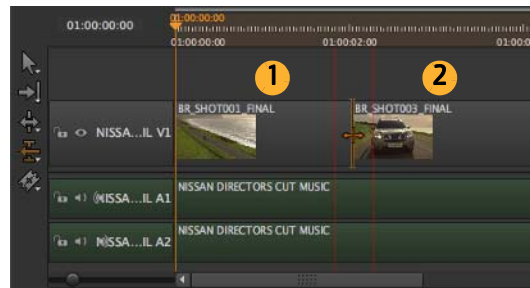


Figure 10.4: Original clips.

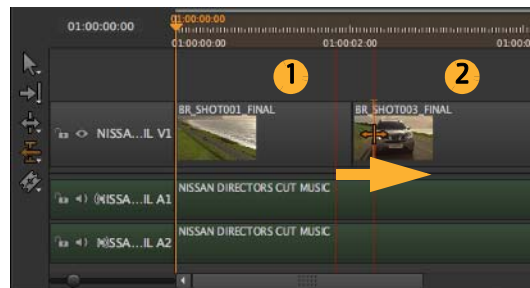
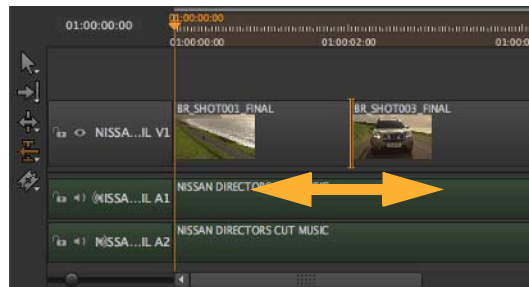


Figure 10.5: Rolled clips.

The Viewer displays the pre-edit track item on the left and the post-edit item on the right, allowing you to accurately gauge the new position of the edit.



Alternatively, click the edit point between the track item and nudge the edit using the **Ctrl/Cmd+←→** keys or hold **Shift** to nudge by the **Frame Increment** set under the Viewer.



## Retime Clip Tool

The **Retime Clip** tool allows you to trim a track item's In or Out point and automatically retime the clip to fill the new track item duration. Activate the **Retime Clip** tool by clicking the tool or pressing **R** three times.

Click-and-drag the edit point to the new position and release to complete the trim and retime. For example, trimming a 50 frame track item to 25 frames retimes the clip to 200%.



Alternatively, click an edit point and nudge the edit using the **Ctrl/Cmd+←→** keys or hold **Shift** to nudge by the **Frame Increment** set under the Viewer.



**TIP:** By holding **Ctrl/Cmd** and dragging an edit, you can retime past the end of the track item's handles.

## Razor and Join Tools

The **Razor** tools allow you to cut track items in to separate parts so you can remove sections or rearrange items on the timeline. Activate **Razor** and **Razor All** by clicking the tool or pressing **R**.

Place the cursor on the target track item, and if the cut is permissible, click to razor the track item or all track items depending on which tool you have selected.



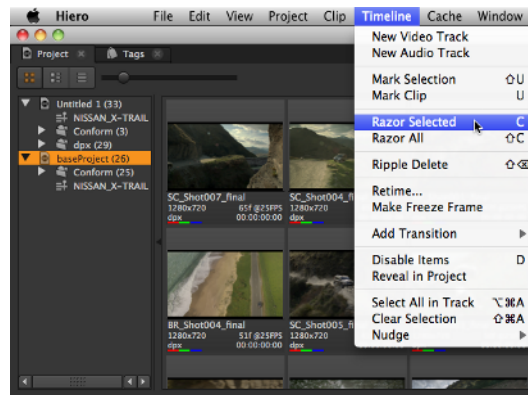
**TIP:** The Razor cursor indicates whether a cut is permissible or not, such as on existing edits.



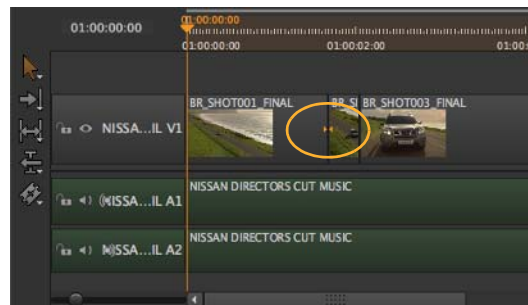
You can also apply cuts at the playhead position from the menu bar using **Timeline > Razor Selected**, or all tracks using **Timeline > Razor All**.



**TIP:** Use the **C** and **Shift+C** hotkeys, or the right-click context menu, to perform the respective cuts.



The **Join** tool can only be used on edit points between two razored track items, denoted by the yellow arrows at the edit.



### Copying cuts from one track to another

The **Copy Cuts** function allows you to quickly apply cuts from one track to other tracks on the timeline. For example, in the timeline shown in [Figure 10.6](#), you could copy the cuts from the second video track to the Reference audio tracks for synchronisation work.

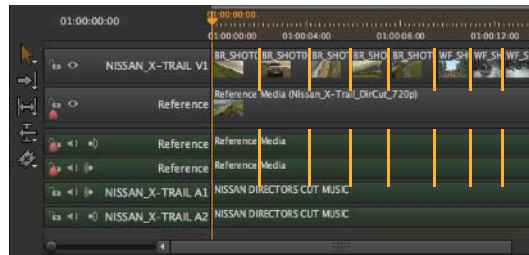
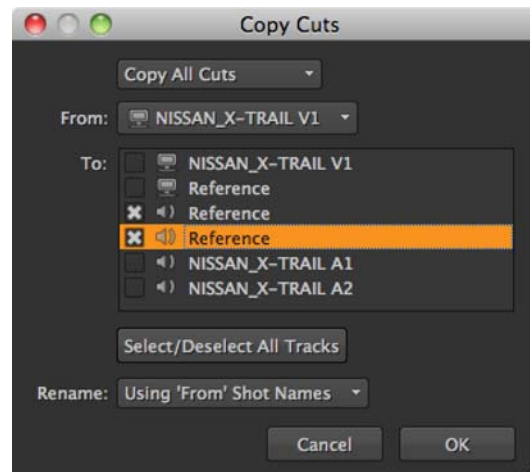


Figure 10.6: Copying cut between tracks.

To copy cuts:

1. Select the track items containing the cuts to copy, or if you intend to copy all the cuts from a track you don't need to make a selection.
2. Right-click in the timeline and select **Copy Cuts**.

The **Copy Cuts** dialog displays.



3. If you made a selection on the timeline, use the dropdown to select **All Cuts** or **Selected Cuts** as required.  
This dropdown is not displayed if no track items were selected.
4. Click the **From** dropdown to select the source track.
5. Check all the destination tracks in the **To** field to which you want to copy the cuts.
6. Choose whether or not the resulting track items are named identically to the source track.  
Selecting **None** retains the destination clip name.
7. Click **OK** to copy the cuts to the destination track(s).

## Setting Soft Trims

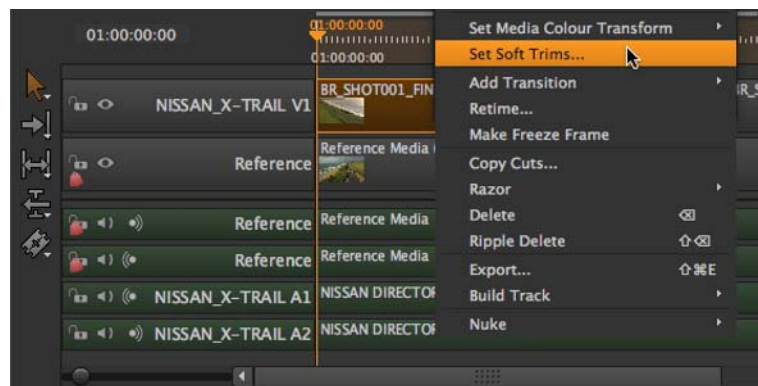
Soft Trims limit the handles on track items to a pre-defined amount, simulating In and Out points on the source clips, allowing you to use other timeline tools on the track items such as **Slip Clip** and **Slide Clip**.



**NOTE:** HieroPlayer does not support Soft Trimming.

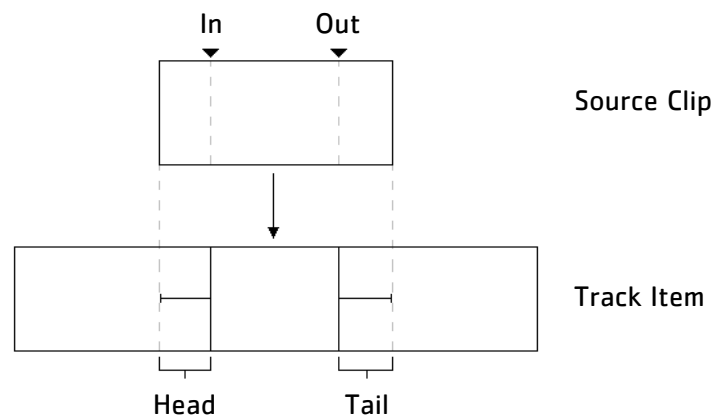
To set Soft Trims on a track item(s):

1. Select the track item(s) on the timeline.
2. Right-click and select **Set Soft Trims**.



The **Set Soft Trims** dialog displays.

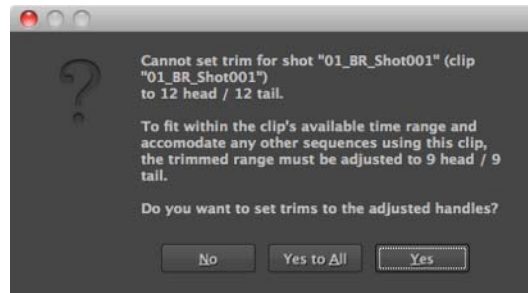
3. Set the number of frames to add to the head and tail of each track item:



- **Use full available range**—sets the handles to the full extent of the source clip frame range.
- **Use Frames**—adds the specified number of frames to the head and tail of the track item(s).

4. Click **OK** to add the specified number of handles.

If the handles requested are not within the available frame range, Hiero displays a warning dialog with a suitable correction for each selected track item.



Click **Yes** to accept, or **No** to abort the operation.



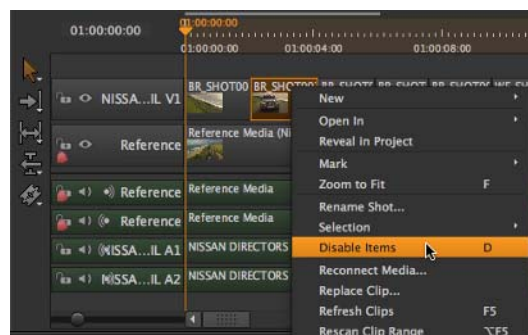
**NOTE:** With track items used in multiple sequences, click **Yes to All** to accept the correction in all instances.

## Enabling and Disabling Track Items

You can temporarily enable or disable tracks and track items on the timeline to selectively view your media without removing track item(s), for example if you wanted to view to lower level video tracks within a timeline.

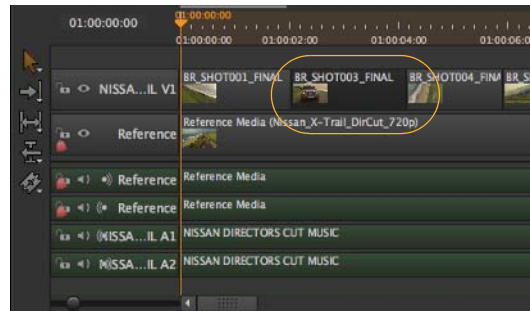
To enable or disable a track or track item(s):

1. Select the item(s) you want to enable or disable.
2. Right-click on a highlighted item and choose **Disable Track** or **Disable Items** to disable the selection.



**TIP:** You can also use the **D** hotkey to disable or enable your selection.

Disabled items appear black, and are effectively removed from the timeline.



3. Right-click the item and select **Enable Clip** to re-enable the clip.

## Adding Transitions

Hiero supports basic fade transitions as well as dissolves between track items. Transitions come in three flavours:

- **Fade in**—fades in from black on a single track item.
- **Fade out**—fades out to black on a single track item.
- **Dissolve**—fades out from one track item and into the next, by merging frames.



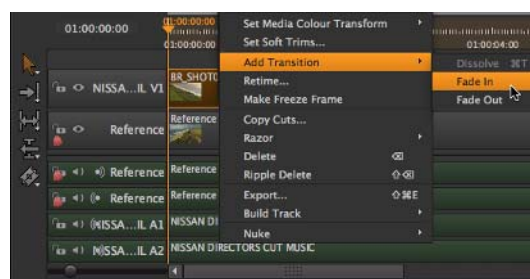
**NOTE:** HieroPlayer does not support adding transitions, though you can edit existing transitions in HieroPlayer projects.



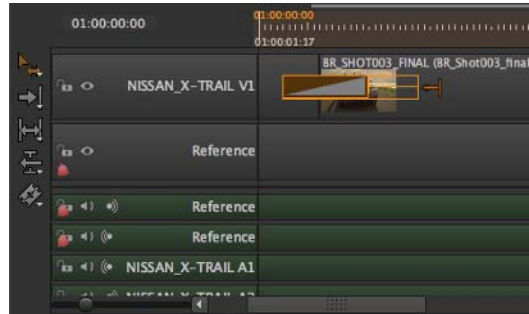
**TIP:** Once a transition is in place, it can be nudged in the same way as an edit using the **Ctrl/Cmd+←→** hotkeys, providing the required handles exist.

To add a fade transition:

1. Right-click the target track item and select **Fade In** or **Fade Out** to add the fade icon.



- Adjust the fade by dragging the fade icon using the **Multi Tool** or **Move/Trim** tool.



To add a dissolve transition:



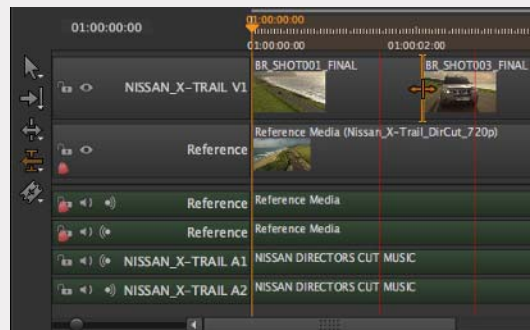
**NOTE:** Dissolves must be between track items on the same track.

- Select the **Multi Tool** or **Roll Edit** tool and hover the mouse pointer over an edit between two track items.

The cursor changes to .



**TIP:** Selecting the edit point displays available handles as a red overlay.



- Right-click and select **Dissolve**, or use the **Ctrl/Cmd+T** hotkeys, to add the dissolve icon to the edit.
- Adjust either side of the dissolve by dragging the icon, in a similar way to using the **Multi Tool** or **Move/Trim** tool.

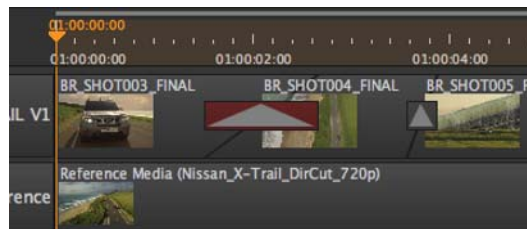
## Invalid Transitions

Transitions are controlled in a similar way to track items, in that you can drag-and-drop them, but with the following restrictions:

- A fade can not be dragged past the ends of the track item it's attached to, and if the item is deleted, the fade is deleted with it.
- Dissolve ends can not be dragged past the ends of the track items they are attached to, and if both items are deleted, then the dissolve is also deleted.

If only one of the track items linked by the dissolve is deleted, the transition remains so that another item can be placed on the other side.

Invalid transitions are coloured red on the timeline. In most cases, adjusting the length of the transition should be enough to correct the error.



## Retiming Clips

In addition to transitions, Hiero (and HieroPlayer in writable projects) supports constant retimes on track items. Decreasing the speed of a track item causes frames to play more than once, whereas increasing the speed skips frames.



**NOTE:** Audio is not currently supported for retimes and is automatically muted to avoid playback problems.

To retime track items using the **Speed** column in the spreadsheet:

1. Select the required event(s) in the spreadsheet view.
2. Click the cog icon and select the required retime method:
  - **Keep source duration**—the track item length is altered on the timeline depending on the retime applied.

For example, retiming a track item to 50% renders frames 1, 1, 2, 2, 3, 3, 4, 4, and so on in the Viewer, and as a result, the item's length is doubled on the timeline.

Retiming a track item to 200% renders frames 1, 3, 5, 7, and so on in the Viewer, but the item's length is halved on the timeline.

- **Keep timeline duration**—the track item length on the timeline is maintained regardless of the retime applied.

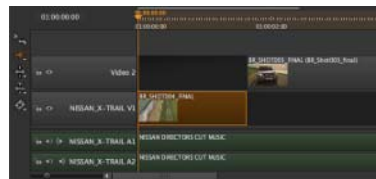
For example, retiming a track item to 50% renders frames 1, 1, 2, 2, 3, 3, 4, 4, and so on in the Viewer, but the item’s length on the timeline remains the same, effectively removing the second half of the item.

Retiming a track item to 200% renders frames 1, 3, 5, 7, and so on in the Viewer, but the item’s length on the timeline remains the same. If no extra frames are available from the source, the item is filled with black frames.

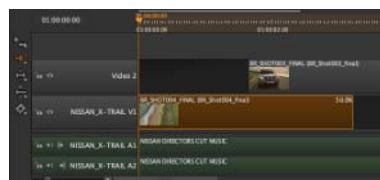
3. Double-click the **Speed** column and enter the retime value.

The following example shows a track item and the results of 50% and 200% retimes with the **Keep source duration** and **Keep timeline duration** methods selected.

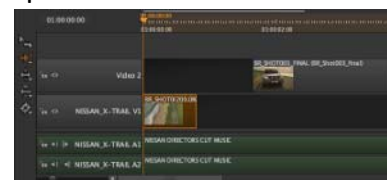
Notice that the **Keep timeline duration** method doesn’t change the length of the track item on the timeline and inserts blank filler frames on the 200% retime?



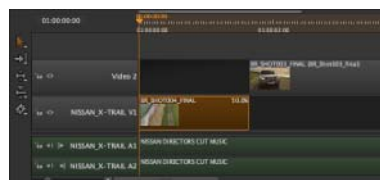
Original clip



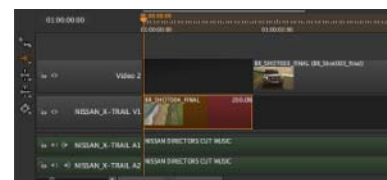
50% Source retime



200% Source retime



50% Destination retime



200% Destination retime

You can also retime track items using the **Src**, **Dst**, and **Duration** columns of

the spreadsheet, though the calculation method depends on the **Time Edit Behaviours** applied.

1. Select the event(s) in the spreadsheet view.
2. Click the cog icon and select the required **Time Edit Behaviours**:

Modify	Using	Result																					
Src In	Retime	<p>Adjusts the event's <b>Src In</b> and retimes the remaining frames to maintain <b>Dst Duration</b>.</p> <p>Before and after a 2 second <b>Src In</b> increase:</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> <tr> <td>50.0%</td> <td>00:00:02:01</td> <td>00:00:04:00</td> <td>50</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> </tbody> </table>	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100	50.0%	00:00:02:01	00:00:04:00	50	01:00:00:00	01:00:03:24	100
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																	
100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100																	
50.0%	00:00:02:01	00:00:04:00	50	01:00:00:00	01:00:03:24	100																	
Src Out	Retime	<p>Adjusts the event's <b>Src Out</b> and applies a retime to maintain <b>Dst Duration</b>.</p> <p>Before and after a 2 second <b>Src Out</b> increase:</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> <tr> <td>151.0%</td> <td>00:00:00:01</td> <td>00:00:06:00</td> <td>151</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> </tbody> </table>	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100	151.0%	00:00:00:01	00:00:06:00	151	01:00:00:00	01:00:03:24	100
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																	
100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100																	
151.0%	00:00:00:01	00:00:06:00	151	01:00:00:00	01:00:03:24	100																	
Src Dur	Retime	<p>Adjusts the event's <b>Src Dur</b> and <b>Src Out</b>, and applies a retime to maintain <b>Dst Duration</b>.</p> <p>Before and after a 50 frame <b>Src Dur</b> increase:</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> <tr> <td>150.0%</td> <td>00:00:00:01</td> <td>00:00:05:24</td> <td>150</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> </tbody> </table>	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100	150.0%	00:00:00:01	00:00:05:24	150	01:00:00:00	01:00:03:24	100
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																	
100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100																	
150.0%	00:00:00:01	00:00:05:24	150	01:00:00:00	01:00:03:24	100																	
Dst In	Retime	<p>Adjusts the event's <b>Dst In</b> and retimes the remaining frames to maintain the relationship between <b>Dst In</b> and <b>Out</b>.</p> <p>Before and after a 2 second <b>Dst In</b> increase:</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> <tr> <td>200.0%</td> <td>00:00:00:01</td> <td>00:00:03:24</td> <td>100</td> <td>01:00:02:00</td> <td>01:00:03:24</td> <td>50</td> </tr> </tbody> </table>	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100	200.0%	00:00:00:01	00:00:03:24	100	01:00:02:00	01:00:03:24	50
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																	
100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100																	
200.0%	00:00:00:01	00:00:03:24	100	01:00:02:00	01:00:03:24	50																	
Dst Out	Retime	<p>Adjusts the event's <b>Dst Out</b> and retimes the remaining frames to maintain the relationship between <b>Dst Out</b> and <b>In</b>.</p> <p>Before and after a 2 second <b>Dst Out</b> increase:</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> <tr> <td>66.7%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:05:24</td> <td>150</td> </tr> </tbody> </table>	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100	66.7%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:05:24	150
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																	
100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100																	
66.7%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:05:24	150																	

Modify	Using	Result																												
Dst Dur	Retime	<p>Adjusts the event's <b>Dst Dur</b> and <b>Dst Out</b>, and applies a retime to accommodate the new <b>Dst Duration</b>.</p> <p>Before and after a 50 frame <b>Dst Dur</b> increase:</p> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>100.0%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:03:24</td> <td>100</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Speed</th> <th>Src In</th> <th>Src Out</th> <th>Src Dur</th> <th>Dst In</th> <th>Dst Out</th> <th>Dst Dur</th> </tr> </thead> <tbody> <tr> <td>66.7%</td> <td>00:00:00:01</td> <td>00:00:04:00</td> <td>100</td> <td>01:00:00:00</td> <td>01:00:05:24</td> <td>150</td> </tr> </tbody> </table>	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100	Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur	66.7%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:05:24	150
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
100.0%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:03:24	100																								
Speed	Src In	Src Out	Src Dur	Dst In	Dst Out	Dst Dur																								
66.7%	00:00:00:01	00:00:04:00	100	01:00:00:00	01:00:05:24	150																								

- Adjust the values as required to retime the track item(s) by the specified amount.



**NOTE:** Any source or destination field highlighted in yellow indicates that the entry has been rounded down for display purposes.

To retime a track item using the **Timeline** menu:

- Select the required track item(s) on the timeline.
- Navigate to **Timeline > Retime**.  
The **Clip Speed** dialog displays.
- Enter the required retime value as a percentage.
- Select the required retime method using the dropdown:
  - Keep timeline duration**—the track item length on the timeline is maintained regardless of the retime applied. When increasing speed, if no extra frames are available from the source, the track item is filled with black frames.
  - Keep source duration**—the track item length is altered on the timeline depending on the retime applied. For example, a 200% retime halves the length of the item.
  - Anchor current frame**—the track item length on the timeline and the current frame's position are maintained after the retime. When increasing speed, if no extra frames are available from the source, the track item is filled with black frames.
- Click **OK** to retime the track item(s).

## Using Freeze Frames

The freeze frame feature enables you to create track items of any length using a single frame. To achieve this, the application takes the first frame of the track item and applies a 0% retime, which is reversible by applying a 100% retime.

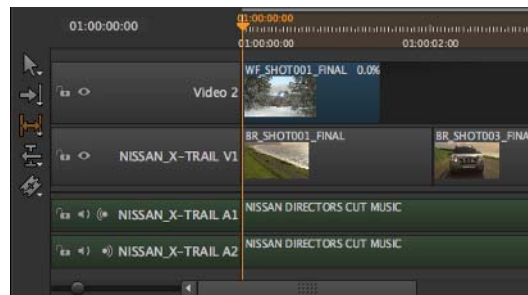
To freeze frame track items:

1. Select the target item(s) on the timeline.
2. Right-click the item and select **Make Freeze Frame**,  
OR  
Navigate to **Timeline > Make Freeze Frame**.



**NOTE:** Freeze Frames can also be created using the spreadsheet retime modes to modify **Src Dur** to 0, or make **Src In** and **Src Out** equal. See the table on [page 137](#) for more information.

3. The selection is retimed to 0% and coloured blue on the timeline for easy identification.



4. Use the **Multi Tool** or **Slip Clip** to set the freeze frame from the available range.
5. Drag the item's edit points, using the **Multi Tool** or **Move/Trim** as required, to set the length of the track item. There's no upper limit for the length of a freeze frame track item.

# 11 VERSIONS AND SNAPSHOTS

In addition to the regular project save and restore options, Hiero and HieroPlayer can record the different states of your workflow as you progress using versions and snapshots.

- **Versions** are children of clips. You can have any number of versions per clip as long as they follow the correct naming conventions, as shown in the table below.

Versions can only be applied to bin clips and track items and can be swapped in and out without overwriting existing work.

- **Snapshots** are time-stamped copies of a sequence, allowing you to save its current state without the inconvenience of saving the entire project. When you restore a snapshot, a warning displays prior to the restore reminding you that edits since the snapshot was taken are lost.

## Using Versions

Versions can be added to clips and track items to allow greater flexibility in your workflow. You can have as many versions as required and cycle through them quickly using hotkeys.



**NOTE:** You cannot use versions when a clip is opened as a timeline, that is, by using the right-click **Open in Timeline** option.

The application relies on specific file naming or folder structure conventions to discover versions:

Convention	Description	Example
<b>File name constants</b>		
Clip name	The file name base must remain the same.	myClip_v1.0001.dpx myClip_v2.0001.dpx myClip_v3.0001.dpx
Version prefix	The delineation between the file name and version information must be either _ (underscore) or . (full stop) and remain the same for all versions.	myClip_v1.0001.dpx myClip_v2.0001.dpx myClip_v3.0001.dpx
<b>File name variables</b>		
Version padding	The version number padding in the clip name can be increased or decreased.	myClip_v1.0001.dpx myClip_v002.0001.dpx myClip_v03.0001.dpx

Convention	Description	Example
Frame padding	The frame padding in the clip name can be increased or decreased.	myClip_v1. <b>01</b> .dpx myClip_v1.1.dpx myClip_v1. <b>0001</b> .dpx
Extension	The file format is interchangeable. See <a href="#">Supported Image Formats</a> for more information.	myClip_v1.01. <b>png</b> myClip_v1.0001. <b>dpx</b> myClip_v1. <b>mov</b>
<b>Note:</b> If the file extension is a movie format, such as <b>.r3d</b> or <b>.mov</b> , the <b>Frame padding</b> can be omitted.		
<b>Folder name constants</b>		
Root folder	The root folder name must remain the same for all folders containing versions.	~/ <b>version</b> /v1/myClip_v1.0001.dpx ~/ <b>version</b> /v2/myClip_v2.0001.dpx ~/ <b>version</b> /v3/myClip_v3.0001.dpx
<b>Folder name variables</b>		
Version padding	The version number padding in the folder name can be increased or decreased.	09_WF_Shot004_ <b>v1</b> 09_WF_Shot004_ <b>v002</b> 09_WF_Shot004_ <b>v03</b>

## Versions in Bins

Versions behave similarly in both bins and sequences, and in both cases, you first have to ingest an existing version.

Ingest and locate the versioned clip, then:

1. Right-click and select **Scan for Versions** to search for available versions. A dialog box lets you know how many versions were discovered.
2. Use the right-click **Version** menu to:
  - Go to the next **Version Up** or **Version Down**.
  - Go to the **Minimum** or **Maximum Versions**.



**TIP:** You can also use the **Alt + ↑↓** hotkeys to increment versions or **Ctrl/Cmd+Alt+ ↑↓** to go to the maximum or minimum.

When you reach the end of the discovered versions, incrementing the version automatically scans for new versions that may have become available.

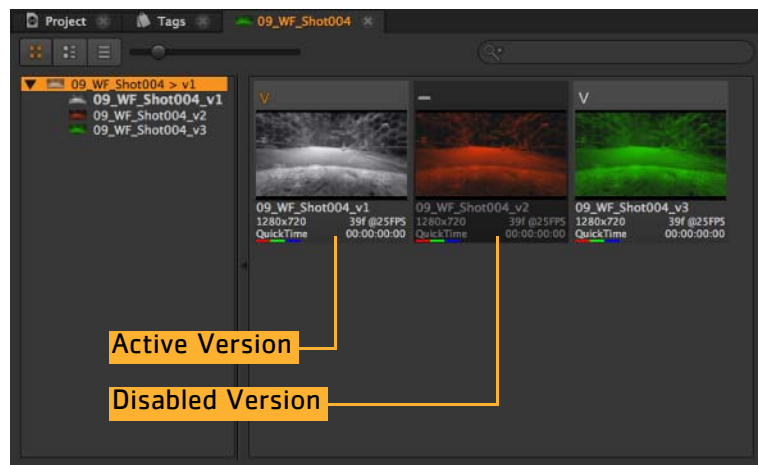


**NOTE:** You can turn off the auto scan function by navigating to **Preferences > General** and disabling **Automatically rescan versions...**

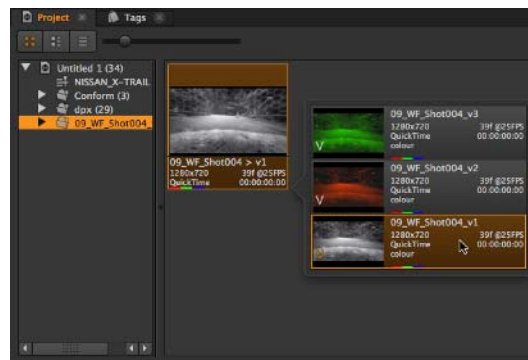
3. For bin clips only, you can select **Version > Open in Versions Bin** to display all discovered versions of the target clip.

The versioning conventions may allow clips into the Version Bin that you weren't expecting. You can disable versions by selecting them and pressing **D** or set the **Active Version** of a clip using the right-click **Version** menu.

The **Active Version** is the version displayed when you drag the source clip to the timeline, denoted by the orange **V** in the top left-hand corner of the thumbnail.



- Once you've sorted all the available versions, select a clip in the bin view and press **V** to display all versions for that clip in a convenient window.



- Select the required clip to set the **Active Version** and apply it to the clip.

## Versions in Sequences

As mentioned previously, versions behave similarly in both bins and sequences, but swapping versions in sequences allows you to compare results more easily.



**NOTE:** You cannot use versions when a clip is opened as a sequence, that is, using the right-click **Open in Timeline** option.

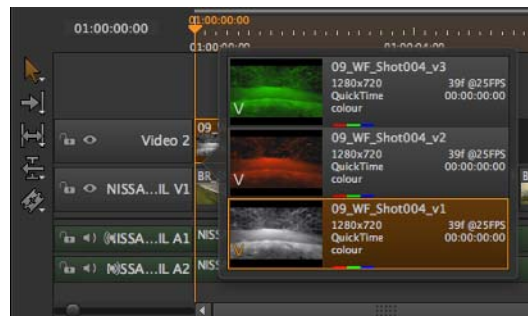
Locate the ingested version clip and drag it to the timeline.

- **Version Up** or **Version Down** to increment the version by one.
- Go to the **Minimum** or **Maximum Version**.



**TIP:** You can also use the **Alt + ↑↓** hotkeys to increment versions or **Ctrl/Cmd+Alt+ ↑↓** to go to the maximum or minimum.

Once you've scanned for versions in the bin view, select a track item on the timeline and press **V** to display all available versions for that item in a convenient window.



Select the required track item version to set the **Active Version**.

## Using Snapshots

Within a project you can save the current state of a sequence as a snapshot, including a comment or tag to describe that snapshot. You can see what snapshots exist for a sequence in the bin view and flip it back to any previously saved state.



**NOTE:** HieroPlayer does not support creating snapshots, but you can restore snapshots created in Hiero.

As an example workflow, take a look at Figure 11.1.

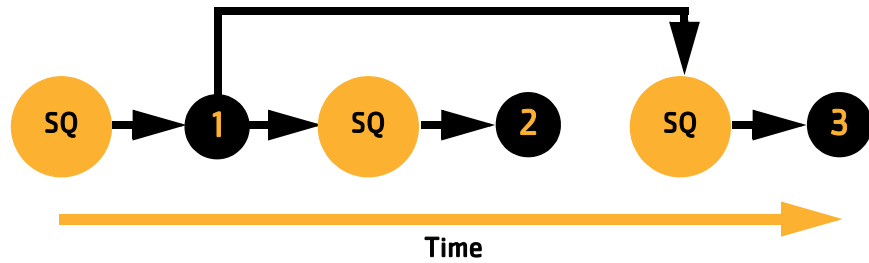


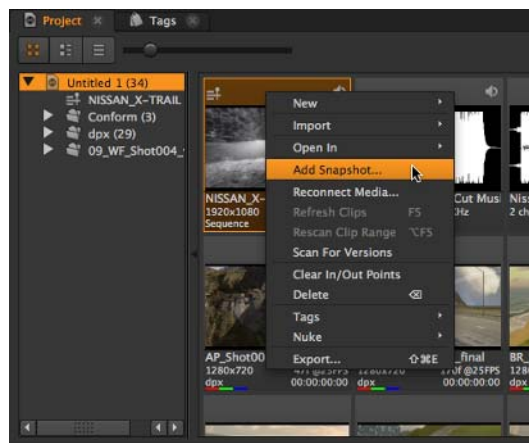
Figure 11.1: A typical workflow using snapshots.

1. Two snapshots of the sequence (SQ) are recorded after edits. See [Creating Snapshots](#).
2. Snapshot 1 is then restored. See [Restoring Snapshots](#).
3. Further edits are made, then the sequence is recorded as snapshot 3.

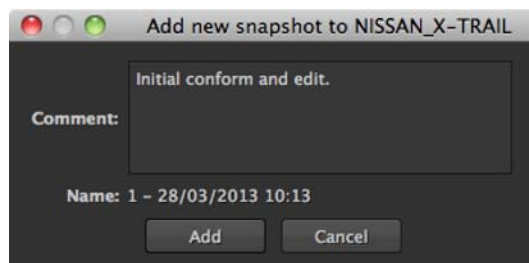
## Creating Snapshots

To create a snapshot for a sequence:

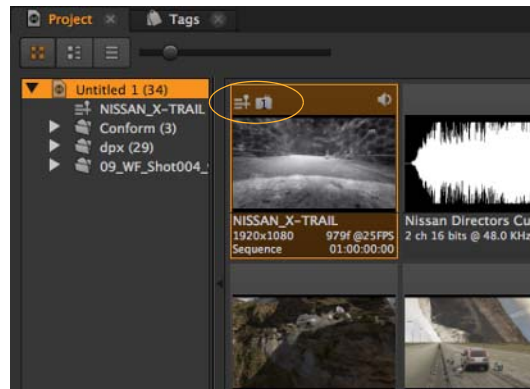
1. Locate the sequence in the bin view.
2. Right-click the sequence and select **Add Snapshot...**



The **Add new snapshot** dialog box displays.



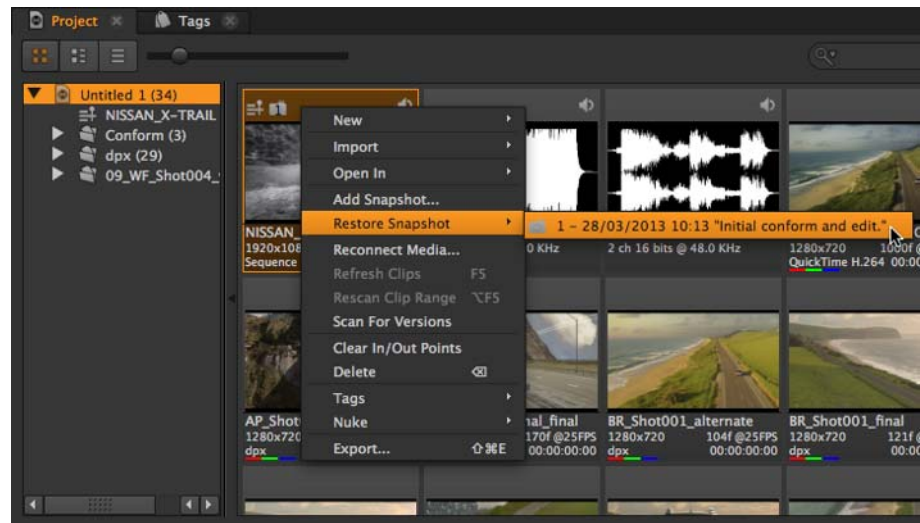
3. Enter a comment, or use the default date and time supplied.
  4. Click **Add** to create the snapshot.
- Snapshots are indicated in the bin view with a camera icon containing the number of snapshots available.



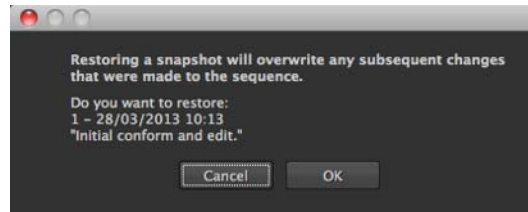
## Restoring Snapshots

To restore a snapshot:

1. Locate the sequence in the bin view.
2. Right-click the sequence and select **Restore Snapshot**.
3. Select the required snapshot from the list.



A warning displays reminding you that edits since the snapshot was taken are lost.



4. Click **OK** to restore the sequence to the point at which the snap was recorded.

## 12 ROUND-TRIPPING AND EXPORT MANAGEMENT

Hiero's export suite can automate round-trips through Nuke, send clips back and forth between Hiero and Nuke using Hiero<>Nuke, transcode, export clip selections from a timeline or bin, write out EDLs and XMLs, or bake out an entire timeline as a single clip in your required delivery format.



**NOTE:** HieroPlayer only supports round-tripping using Hiero<>Nuke.

With the addition of Python bindings to perform the same functions, this infrastructure provides a massive amount of flexibility, whether your pipeline is GUI or command line orientated.



**NOTE:** Hiero is non-destructive and can slot into your pipeline if you setup your shot template to mirror the existing file structure.

Hiero ships with several context-sensitive and ad hoc export options:

- [Round-Tripping Using the Export Dialog](#)—the process of preparing a project for export and paving the way for VFX work to come back into Hiero.
- [Round-Tripping Using Hiero<>Nuke](#)—enables you to open selections in Nuke scripts, from either bin clips or track items, add clips and track items to existing scripts, and send rendered Write nodes from Nuke back to Hiero.
- [Advanced Send to Nuke](#)—a single clip or bin export option that doesn't require the Export dialog or Hiero<>Nuke.
- [Ad Hoc Exports](#)—an umbrella covering exports that you might not perform on a per project basis, such as EDL or XML exports.

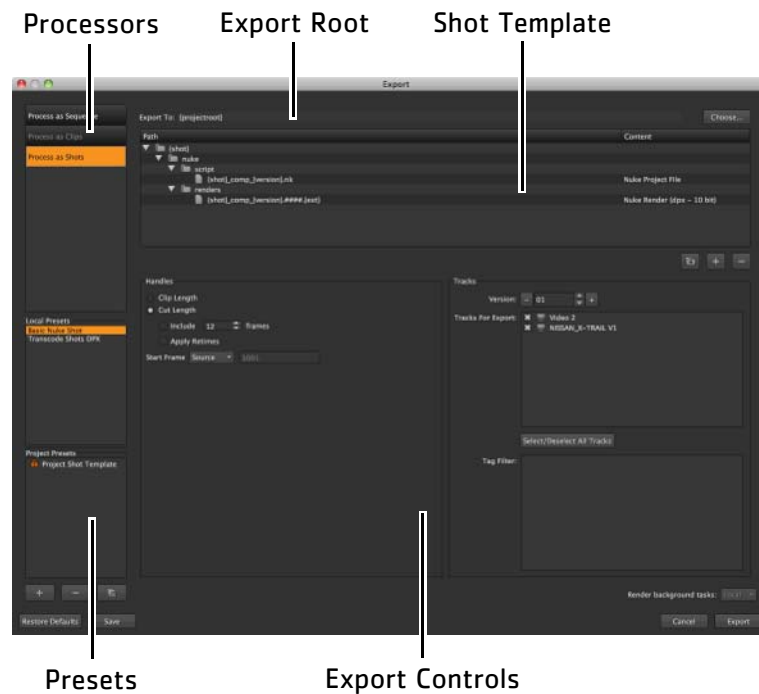
### Round-Tripping Using the Export Dialog

A round-trip describes the process of exporting clips to another application, in this case Nuke, and then paving the way back into Hiero to conform the new VFX clips.

### Introduction to the Export Dialog

Hiero uses shot templates and processors to perform some export operations, including round-tripping and EDL/XML creation. The **Export**

dialog controls what is exported and where, and whether or not to expect versioned clips as part of a round-trip from Nuke.



Two types of **Presets** are available to construct commonly used export tasks:

- **Local Presets**—saved in a Task Presets folder using the XML file format. See [Running Python During Startup](#) for more information on save locations and the differences between platforms.
- **Project Presets**—you can drag-and-drop **Local Presets** into this panel to save the preset within a project .hrox file. This option is designed for collaborative work, allowing you to quickly share your export presets.



**NOTE:** If you select **Process as Shots**, you'll notice there is a locked **Project Shot Template** included in the **Project Presets**. This preset can only be edited from the main **Project > Edit Settings** menu. See [Using the Shot Template](#) for more information.

Hiero also uses **Content Presets** in all shot templates, enabling you to create commonly used export conditions, which are then available across all projects. Some presets are only available with certain processors, for example, the **EDL Exporter** preset cannot be used with **Process as Shots**.

For your convenience, Hiero ships with a number of ready-made presets,

but you can edit these as required:

- **Transcode Images**—defines transcode parameters allowing you to save your most-used file type conversions.
- **Nuke Project File**—defines the paths used by Nuke Read and Write nodes during a round-trip.
- **Nuke Render**—defines the render format for Nuke Write nodes. Add multiple Nuke Render presets to create multiple Write nodes in Nuke.
- **External Render**—defines the export paths used by third party applications, such as Adobe® After Effects®, during a round-trip.
- **EDL Exporter**—used to export a sequence to the EDL format.
- **SymLink Exporter**—creates symlinks to the location of the source files, rather than making copies.
- **XML Exporter**—used to export a sequence to XML format.
- **Copy Exporter**—creates copies of the source files to a specified location, rather than symlinking.
- **Audio Export**—copies any audio tracks to .wav files in a specified location.

## Using the Shot Template

The shot template sets up the folder hierarchy and naming conventions for export processors such as Transcode Images. Any folders added to the template are created during export unless they already exist, in which case the export writes to the existing structure.

Hiero ships with default templates for your convenience, but you can quickly create custom templates using folders and “tokens”, which are replaced with the relevant information during export.



**TIP:** A useful auto-expansion feature can save time when creating folder structures in the shot template. Simply type the required folder structure in the first field of the shot template, then press enter to create the specified hierarchy.

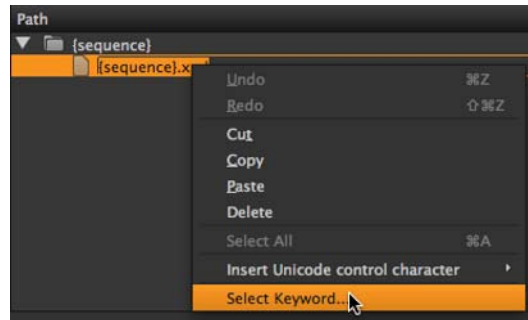
Hiero can resolve the following tokens during export:

Token	Resolves to
{binpath}	The bin structure to preserve. Including this token recreates your bin structure upto the nearest parent bin.
{clip}	The name of the clip used in the shot processed.
{day}	The local weekday name, abbreviated to Mon, Tue, and so on.
{DD}	The day of the month as a decimal, 01, 02, and so on.

Token	Resolves to
{event}	The timeline event number associated with the track item to process.
{ext}	The extension of the file to output, such as <b>.dpx</b> or <b>.mov</b>
{filebase}	The base of the clip name to process. For example, the filebase of Shot01_####.dpx is Shot01_####.
{fileext}	The format of the clip to process, such as <b>.dpx</b> or <b>.mov</b>
{filehead}	The source clip filename not including frame padding or extension. For example, the filehead of Shot01_####.dpx is Shot01.
{filename}	The source clip name of the media to process.
{filepadding}	The source filename padding, which you might use for formatting frame indices.
{fullbinpath}	The full bin structure to preserve. Including this token recreates the bin structure upto the project level.
{fullday}	The local full weekday name.
{fullmonth}	The local full month name.
{MM}	The month of the year as a decimal, 01, 02, and so on.
{month}	The local month name, abbreviated to Jan, Feb, and so on.
{project}	The name of the parent project of the export item.
{projectroot}	The root export filepath as specified in the <a href="#">Project Settings</a> .
{sequence}	The sequence name to process.
{shot}	The name of the track item to process.
{track}	The name of the track to process. Exporting EDLs using this token generates a separate EDL for each track.
{user}	The current username.
{version}	The string <b>v#</b> , defined by the number ( <b>#</b> ) set in the Version section of the export dialog
{YY}	The year of the century as a decimal, 01, 02, and so on.
{YYYY}	The year, including century.



**TIP:** After double-clicking the path column, right-click and choose **Select Keyword** to display a list of available export tokens, though only valid tokens for the current selection are listed.



Token substrings are valid if you need to extract a certain part of an evaluated string. For example, if `{shot}` resolves to `NC100`, then:

- `{shot [0:2]}` - resolves to `NC`
- `{shot [-3:]}` - resolves to `100`

Similarly, anything within the outer brackets is evaluated as a Python string. For example, if `{shot}` resolves to `NC_10_20`, then:

- `{shot.split('_')[0]}` - resolves to `NC`
- `{shot.split('_')[2]}` - resolves to `20`

### Example Shot Templates

Hiero's shot template enables you to create as many Nuke Read and Write nodes as required for a project. A typical use case might be creating JPG clips for review and DPX resolution clips for finishing.





**TIP:** A useful auto-expansion feature can save time when creating folder structures in a template. Simply type the required folder structure in the first field of the template, then press enter to create the specified hierarchy.

### Multi-format exports

The following example describes how to build a shot template to export a sequence of MOV clips, create DPX and JPG Write nodes in Nuke, and bring the DPX clips back into Hiero.

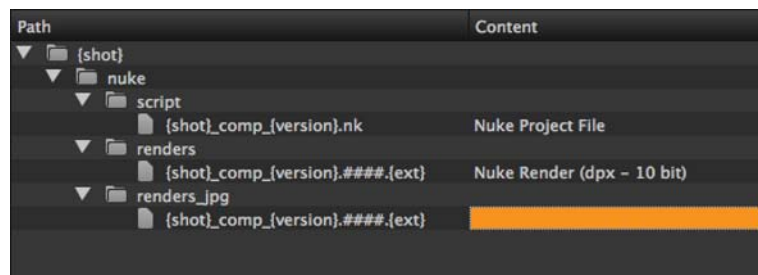
1. Set up an export as described in [Round-Tripping Using the Export Dialog](#).
2. In the **Export** dialog, select the **Basic Nuke Shot** preset in the bottom-left pane to auto-complete the shot template with the preset values.
3. Click **Duplicate selected preset** and give the new preset a name.
4. Rename the **renders** folder **renders\_dpx**.

5. Select the **nuke** folder and click  to add a new folder. Name the new folder **renders\_jpg**.
6. Select the **renders\_jpg** folder and click  to add a new entry.
7. Replace the {filename} token with {shot}\_comp\_{version}.####.{ext}, the same as the existing entry under **renders\_dpx**.

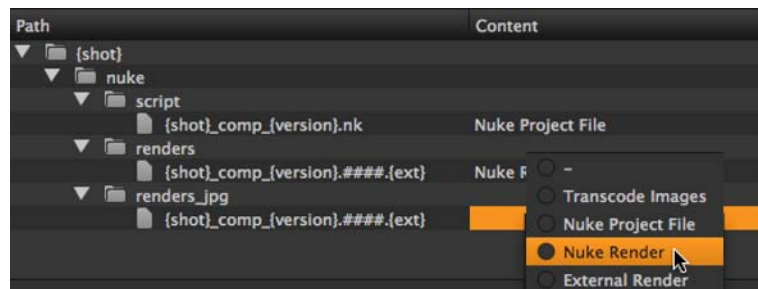


**NOTE:** The #### marks represent frame numbers for image sequences. If you were creating MOV clips, they'd be omitted.

The shot template should look something like this:

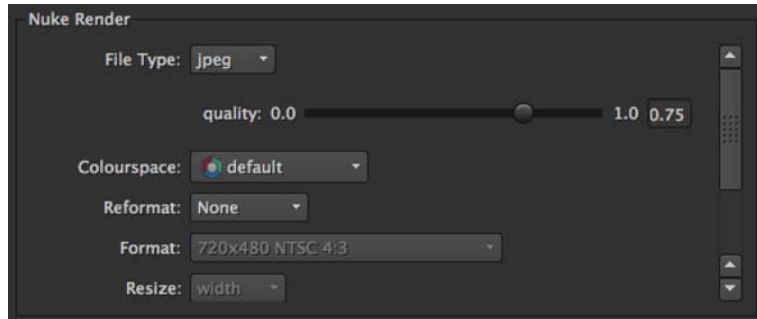


8. Click the **Contents** column and select **Nuke Render**.



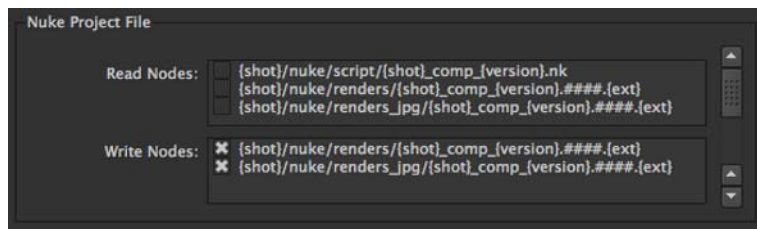
**NOTE:** When using a third party application to produce the VFX work, select **External Render** instead of **Nuke Render**.

9. In the **Nuke Render** settings, use the **File Type** dropdown to select **jpeg**.




Notice that the settings available change depending on the **File Type** selected?

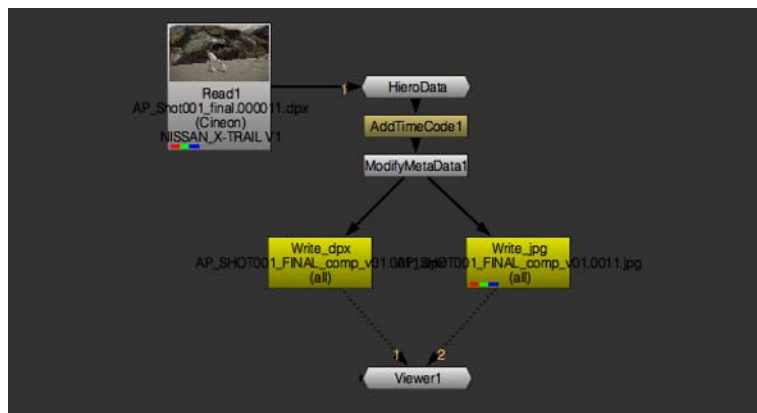
10. Click **Nuke Project File** in the shot template and check that both **Write** nodes are enabled.



11. Set up the rest of the export as described in [Exporting to Nuke](#) and click **Export**.

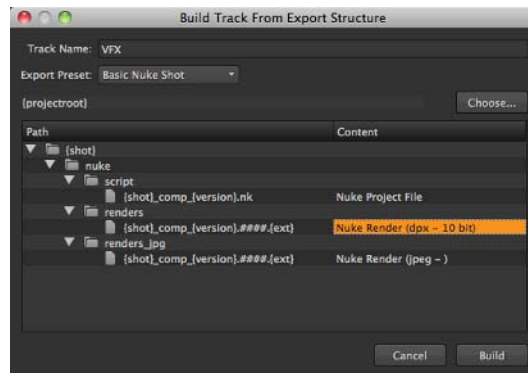
12. When complete, locate a **Nuke Shot Exporter** entry in the **Export Queue** and click the  icon to reveal the Nuke scripts in a browser.

13. Drag the script into Nuke's Node Graph to display the script.



Once the VFX work is complete, bring the DPX clips back into Hiero:

1. Select the original clips on the Hiero timeline.
2. Right-click and select **Build Track > From Export Structure**.  
 The **Build Track From Export Structure** dialog displays.
3. Enter a **Track Name** or use the default **VFX**.
4. Select the **Export Preset** used from the dropdown menu. In this case, **Dual Render**.
5. Enter the filepath of the **Export Root** directory or click **Choose** and browse to the location.
6. Select the **Nuke Render (dpx - 10 bit)** entry.



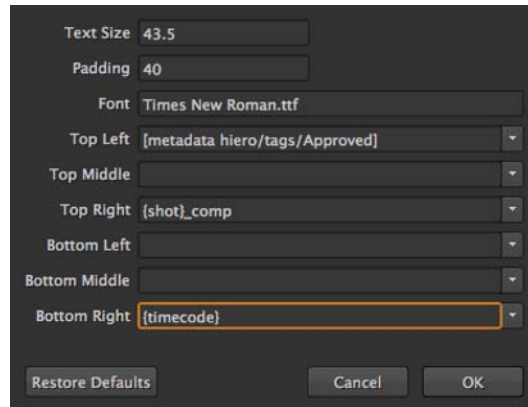
7. Click **Build** to create the VFX track.  
 Hiero automatically creates the new track containing the DPX clips.

## Adding Burn-in Text to Exports

Hiero can burn-in text during the export process using a simple Nuke gizmo. The gizmo contains controls for the font style and fields denoting the position of the text.



**NOTE:** The **Font** field only accepts the full filepath and name of the font file to use. For example, on Mac OS X `~/Library/Fonts/Verdana.ttf`



You can mix-and-match the following methods to create burn-in text:

- Enter text manually, what you see is what you get in the burn-in.
- Use any of the tokens valid in the shot template as burn-in tokens. For example:

```
{shot}_comp
```

Extracts the shot name from the timeline and appends **\_comp**.

See [Using the Shot Template](#) for more information.

- Use metadata from tags applied to clips and track items. For example:

```
[metadata hiero/tags/Approved]
```

Extracts the Approved tag from the clip or track item. You can also append **note** to include any notes associated with the tag:

```
[metadata hiero/tags/Approved/note]
```



**NOTE:** You must precede spaces and slashes in the tag name with \\ (backslashes) to enable Hiero to process it correctly. For example:

```
[metadata hiero/tags/Blue\\ Screen/note]
```

```
[metadata hiero/tags/f\\/1.4/note]
```

## Adding Additional Nuke Nodes During Export

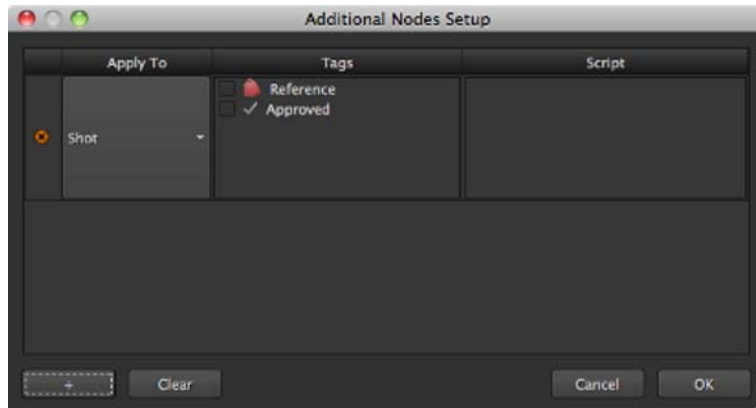
Hiero can include additional Nuke nodes, in any **Nuke Project File** or **Transcode** export in the Shot Template, by simply copying and pasting scripts from Nuke.

You can add nodes to shots, tracks, or sequences, or include them as unconnected ad hoc nodes in the script, filtered by tags if necessary.

1. In the **Export Controls** panel, scroll down to the **Additional Nodes** control and click **Edit**.

The **Additional Nodes Setup** dialog displays.

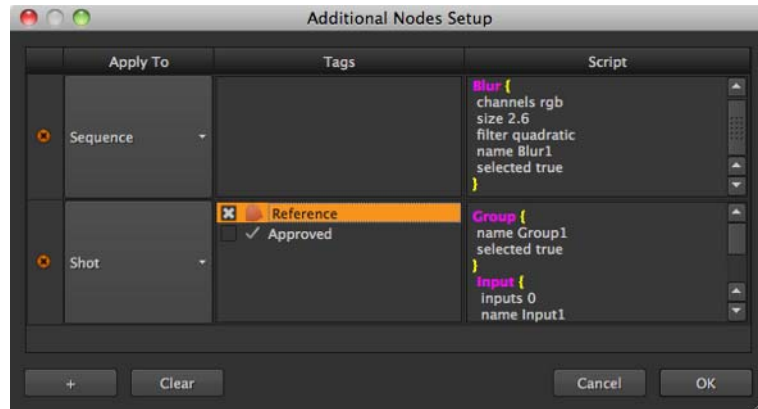
2. Click  to add an entry.



3. Click the **Apply To** field and select what the current entry applies to:
  - **Shot**—the additional nodes are added to the script for each shot in the export.
  - **Track**—the additional nodes are added to the script for each track in the export.
  - **Sequence**—the additional nodes are added to the script for the entire sequence.
  - **Unconnected**—the additional nodes are added to the script, but are not connected to the export node tree.
  - **None**—temporarily disables the current entry.
4. Select the **Tags** that you intend to use to filter which items receive the additional nodes.  
 If you want to affect only the Reference track, for example, select the Reference tag. All items without that tag are ignored.
5. Copy and paste a node from Nuke into the **Script** panel.



**NOTE:** If you need more than one node, you might consider creating a Group in Nuke and pasting that into the Script panel.




6. Click **OK** to accept the additional nodes.
7. Select the **Additional Nodes** checkbox and complete the export process as described later in this chapter.

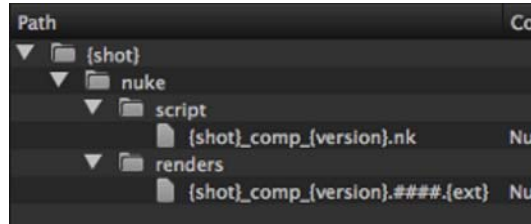
## Exporting to Nuke

1. Select a sequence in the bin view and navigate to **File > Export**. The **Export** dialog displays.
2. Select **Process as Shots** from the Processors list.
3. Enter the **Export To** directory or click **Choose...** and browse to the location.  
 The **Export To** directory is the starting point from which the shot template builds your shot hierarchy.
4. Select the **Basic Nuke Shot** preset under **Local Presets** to auto-complete the shot template or select **Project Shot Template** to use the **Project Settings** template.



**NOTE:** You can build a custom shot template using **Path** tokens, the **Contents** field, and the  buttons. Simply copy an existing template and edit as required.

**Basic Nuke Shot** creates a folder for each clip, or shot, containing a **plates** folder and a **nuke** folder containing **script** and **renders** folders.



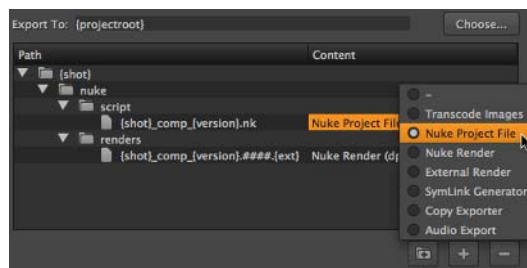
The tokens in the **Basic Nuke Shot** template break down as follows:

- **{filename}** simply extracts the source filenames as they appear in the file browser.
- **{shot}\_comp\_{version}.nk** extracts the track item name for each clip and the version selected in the **Export Controls**. For example, **Shot01\_comp\_v03.nk**
- **{shot}\_comp\_{version}.###.ext** appends padding and the specified file extension. For example, **Shot01\_comp\_v03.0001.dpx**



**NOTE:** See the [Example Shot Templates](#) for information on how to use the shot template to create multiple format Write nodes in Nuke.

5. Click the **Nuke Project File** preset to display the **Read Node** and **Write Node** settings.

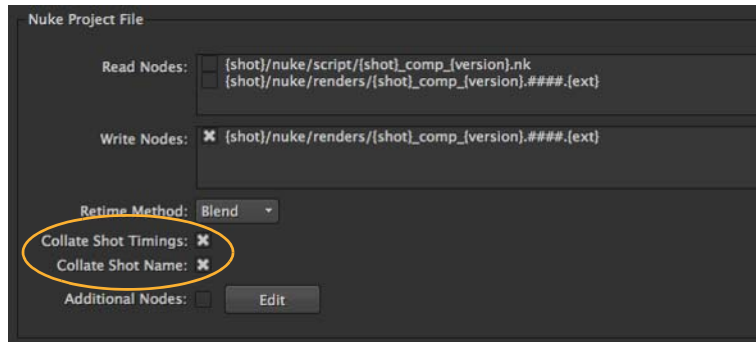


6. Check which path from the shot template should be used for the Nuke Read and Write nodes. In this case:
  - **{shot}/plates/{filename}** to resolve to the symlinks during export.
  - **{shot}/nuke/renders/{shot}\_comp\_{version}.###.ext** to resolve the render path where Hiero expects to find the Nuke files.
7. Enable **Collate Shot Timings** or **Collate Shot Names** to create additional Nuke Read nodes in the same script for clips that would normally be

hidden by clips higher up the track hierarchy or clips on the same track with the same track item name.

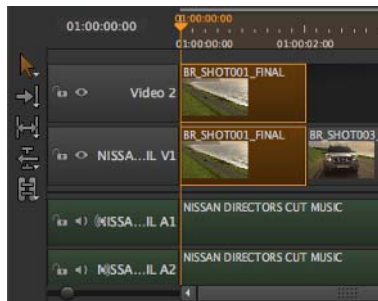


**NOTE:** If you have a Read node selected, you can't enable the **Collate** functions.

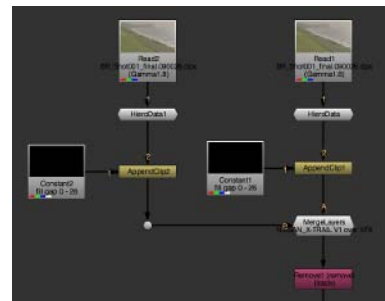


For example:

- Items on track 1 that would otherwise be hidden by track 2.

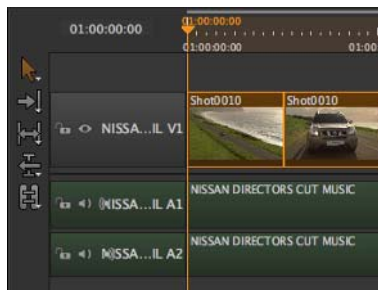


Exporting these track items from Hiero...

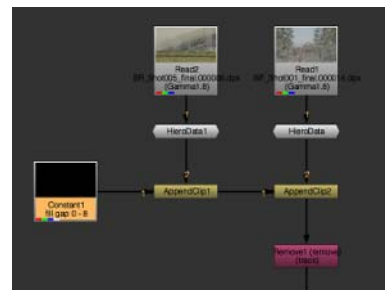


...creates a Nuke script for each track item containing both clips.

- Two items on the same track with the same shot name.

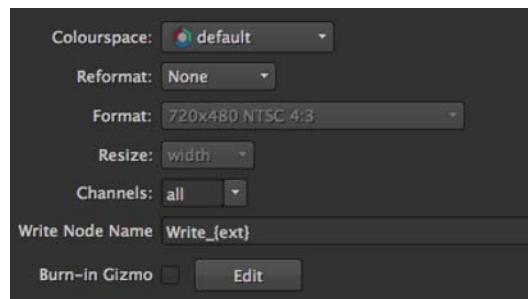


Exporting these track items from Hiero...



...creates this Nuke script.

8. Click the **Nuke Render** preset to display the **file type** settings.
9. Select the **file type** to render using the dropdown and complete the relevant fields, dependent on the **file type** selected.
10. Set the following controls common to all file types:



- **Colourspace**—use the dropdown to set the colourspace to render, such as **linear**, **REDLog**, or **raw**.
- **Reformat**—select the required reformatting option to enable the **Format** dropdown.
- **Format**—sets the format to render out in Nuke, such as **1920x1080 HD 1080**.

Select **Custom...** to create formats that don't appear in the list of pre-sets.

- **Resize**—sets the method by which you want to preserve or override the original aspect ratio:
  - **width**—scales the original until its width matches the format's width. Height is then scaled in such a manner as to preserve the original aspect ratio.
  - **height**—scales the original until its height matches the format's height. Width is then scaled in such a manner as to preserve the original aspect ratio.
  - **fit**—scales the original until its smallest side matches the format's smallest side. The original's longer side is then scaled in such a manner as to preserve original aspect ratio.
  - **fill**—scales the original until its longest side matches the format's longest side. The input's shorter side is then scaled in such a manner as to preserve original aspect ratio.
  - **distort**—scales the original until all its sides match the lengths specified by the format. This option does not preserve the original aspect ratio, so distortions may occur.
- **Channels**—set the channels to export using the dropdown. The default, **all**, exports all channels in the image.

If you want to export a non-standard channel, type the name of the channel into the field manually.

- **Write Node Name**—if you intend to create more than one Nuke Write node, define the name here. The default, **Write\_{ext}**, appends the individual Write nodes with the file extension being written. You can, however, use any of the tokens Hiero recognises.
- **Burn-in Gizmo**—when enabled, text burn-in is applied to the media using a Nuke gizmo. Click **Edit** to define the information applied during burn-in. See [Adding Burn-in Text to Exports](#) for more information.

11. Set the **Handles**, if required:

- **Clip Length**—exports the full clip length available, as if the clip was opened as a Viewer.
- **Cut Length**—exports only the cuts included on the timeline.



**NOTE:** Selecting **Cut Length** allows you to add handles to each clip, up to the maximum available source clip length.

12. Check **Apply Retimes** to export any retimes present on the timeline.

13. Set how clip **Start Frames** are derived using the dropdown menu:

- **Source**—use the source clip's start frame.
- **Custom**—specify a start frame for all clips using the field to the right.

14. Set the **Version** number, **Tracks For Export**, and **Tag Filter**, if applicable.



**NOTE:** See [Using Versions](#) for more information on how versioning works in Hiero.

15. If you're using a render farm, select the renderer from the **Render background task** dropdown.

Hiero requires a Python script to pass exports to your render farm of choice. Scripts must be located in specific directories, dependent on platform, as listed in [Running Python During Startup](#). If no scripts exist, the dropdown is disabled.

Some example scripts are included in the Hiero package in the following directories:


- On Mac: /Applications/Hiero 1.7v1/Hiero 1.7v1.app/Contents/Plugins/site-packages/hiero/examples/
- On Linux: /usr/local/Hiero 1.7v1/Plugins/site-packages/hiero/examples/
- On Windows: drive letter:\Program Files\The Foundry\Hiero 1.7v1\plugins\site-packages\hiero\examples

16. Click **Export**.

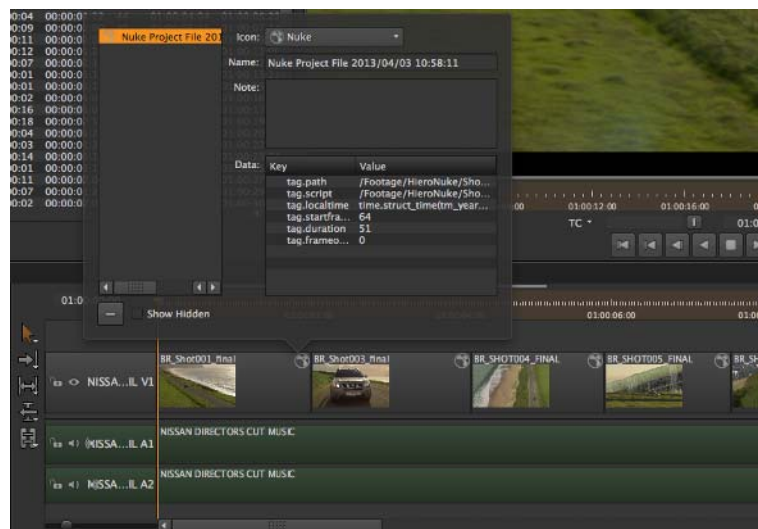
The **Export Queue** window displays an estimate of how long each component of the export is expected to take.

Once the export is complete, the file structure specified in the shot template is created. You can then import the Nuke clips on a separate track when they're ready.



**TIP:** Click the  icon to reveal the exported file in a browser window.

When clips are exported from Hiero, they are marked with a Nuke tag flagging which clips have an export history. Clips tagged in this way can be used to build VFX tracks quickly as described in building [Tracks From Export Tags](#).



**Building VFX Tracks**

When the compositing work is complete, the clips are ready to re-ingest. The shot template defines where the Nuke files reside, so all you need to do is instruct Hiero to build [Tracks From Export Structure](#).

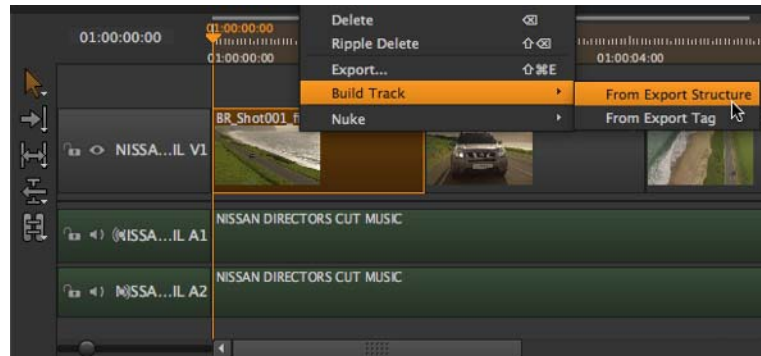
Alternatively, if you have a history of rendered VFX clips, different versions and so on, you can also build [Tracks From Export Tags](#) to select from a list of available clips.

## Tracks From Export Structure

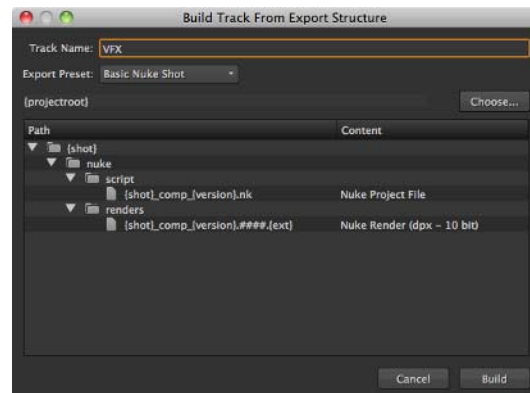
1. Select the required clips on the timeline and right-click to display the context sensitive menu.



**TIP:** You may find it easier to select clips in the spreadsheet and then right-click on the timeline.



2. Click **Build Track > From Export Structure**.  
The **Build Track From Export Structure** dialog displays.



3. Enter a **Track Name** or use the default **VFX**.
4. Select an **Export Preset** using the dropdown menu. In this case, select the same preset used during the export.
5. Enter the filepath of the **Export Root** directory or click **Choose** and browse to the location.



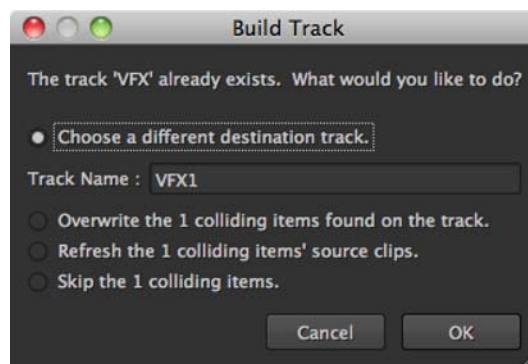
**NOTE:** The root directory is the location entered in **Export To** when exporting the project.

6. Select the content you intend to ingest from the shot template. In this case, the **Nuke Render**.
7. Click **Build** to create the VFX track.



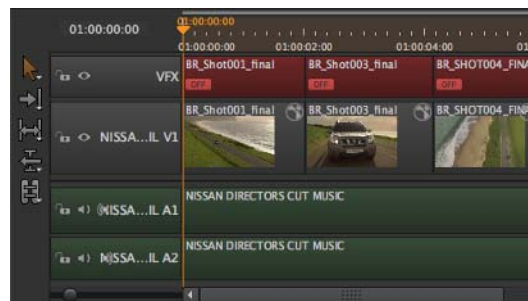
**NOTE:** Hiero warns you if no selection is made in the **Contents** column.

8. If a clip already exists in any of the target tracks, a dialog displays containing options on how Hiero should behave.



9. Select the required option and click **OK** to proceed.

Hiero automatically creates a new track containing the VFX clips, if they exist, or offline place holders if the clips are a work in progress.



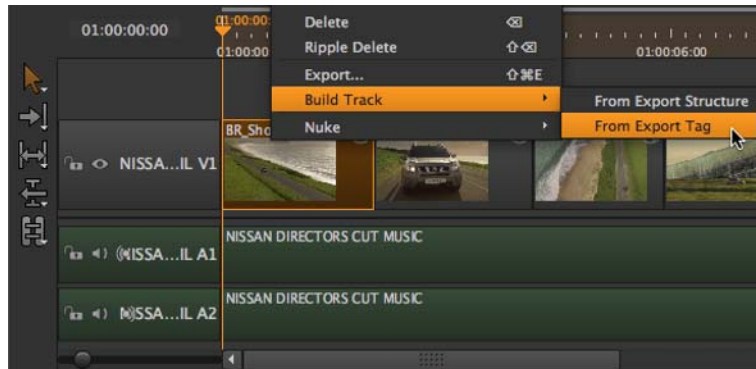
The clips are automatically updated when work is complete as long as they are saved with the expected name and location, as specified in the shot template.

## Tracks From Export Tags

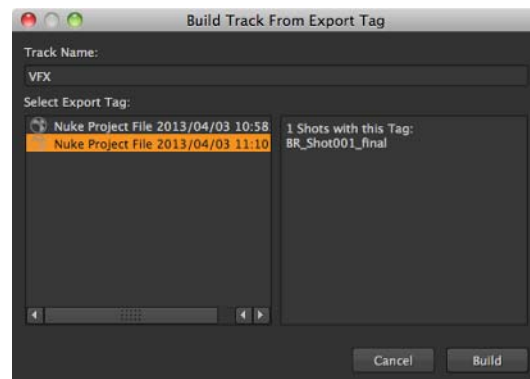
1. Select the required clips on the timeline and right-click to display the context sensitive menu.



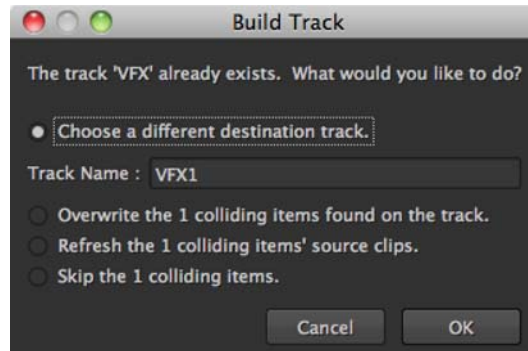
**TIP:** You may find it easier to select clips in the spreadsheet and then right-click on the timeline.



2. Click **Build Track > From Export Tag**.  
The **Build Track From Export Tag** dialog displays.

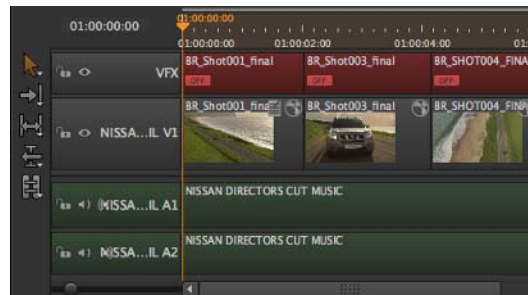


3. Enter a **Track Name** or use the default **VFX**.
4. Select the required export tag in the left-hand panel to display tag information in the right-hand panel.
5. Click **Build** to create the VFX track.
6. If a clip already exists in any of the target tracks, a dialog displays containing options on how Hiero should behave.



7. Select the required option and click **OK** to proceed.

Hiero automatically creates a new track containing the VFX clips, if they exist, or offline place holders if the clips are a work in progress.



## Round-Tripping Using Hiero<>Nuke

Selections in Hiero and HieroPlayer can be opened in Nuke using Hiero<>Nuke, which is an open port between the two applications. When the connection is established, Hiero<>Nuke “listens” for changes applied to clips, in either application, and updates them automatically with the latest version.



**NOTE:** Hiero and HieroPlayer rely on the locked **Project Shot Template** when you select **Open in Nuke**. Navigate to **Project > Edit Settings > Export / Roundtrip** to define the template using the **Local Nuke Roundtrip** settings.

HieroPlayer is limited to editing the **External Media Track Name** as there is no support for creating shot templates in HieroPlayer. You cannot use **Open in Nuke** if the project was created in HieroPlayer.

Once established, the link operates in three distinct ways:

- [Open in Nuke](#)—allows you to open your selections in single or multiple new Nuke scripts, depending on context.

- [Send to Nuke](#)—sends your selections to an existing Nuke script. This option is only available when a connection to an open Nuke script has been established.
- [Send to Hiero](#)—allows you to send a rendered Write node from Nuke to Hiero, creating a new bin.

## Connecting Hiero<>Nuke

To connect Hiero<>Nuke:

1. Navigate to **Window > Hiero<>Nuke** and then click **Start Server** to begin “listening” for new Nuke output.
2. Click **Install Nuke Scripts** and follow the on-screen instructions to edit your **init.py** file.

The application then installs **hiero\_tools.py** in your **.nuke** directory.

3. Click **OK** to dismiss the install dialog and then click **Launch Nuke** to start the application.

Once the connection has been verified, enable **Start server on startup** in Hiero or HieroPlayer and **Start connection on startup** in Nuke to establish the link automatically in future.



**NOTE:** Hiero<>Nuke is configured to run between applications on the same machine, but if you know the address and port number of a remote machine, click **Edit Server Address** and enter the appropriate details to connect the applications.

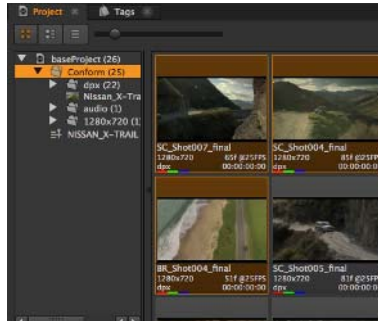
### Open in Nuke

**Open in Nuke** operates differently depending on whether you’re opening clips or track items. Clips are opened independently, whereas track items are opened with additional nodes to produce a timeline position relative to a specified master track item.

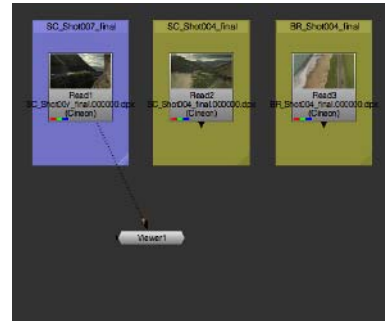
### To open bin clips in Nuke

1. Select the clip(s) in the bin view.
2. Right-click a highlighted clip and select **Open in Nuke**.

The selected clips are opened in the Nuke application specified in the Preferences > Nuke / Export > Nuke Path field.



These selections from Hiero...

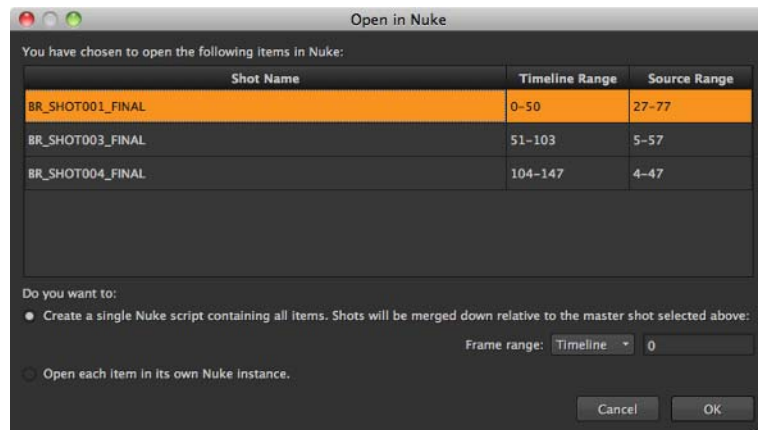


...Opened in Nuke

### To open track items in Nuke

1. Select the track items in the timeline view.
2. Right-click a highlighted item and select **Open in Nuke**.

The **Open in Nuke** dialog displays.



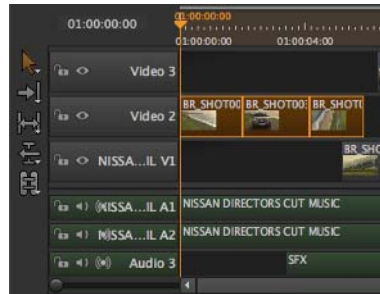
3. Select the track item to use as the master, that is, the item to use to create the relative timeline positions of the other track items.
4. Select the frame range to use from the dropdown menu:
  - **Timeline**—use the frame range occupied by the track item on the timeline.
  - **Source**—use the frame range from the source file.
  - **Custom**—use a custom frame range by entering the required start frame in the field provided.

5. Click **OK**.

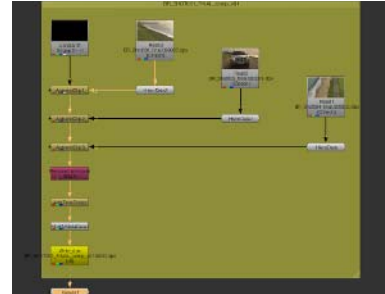


**NOTE:** If you haven't set a valid **Project Root**, a dialog prompts you for a file path.

The selected track items are opened in the Nuke application specified in the **Preferences > Nuke / Export > Nuke Path** field.



These selections from Hiero...



...Opened in Nuke

Hiero also adds a single offline track item to receive the incoming VFX work.



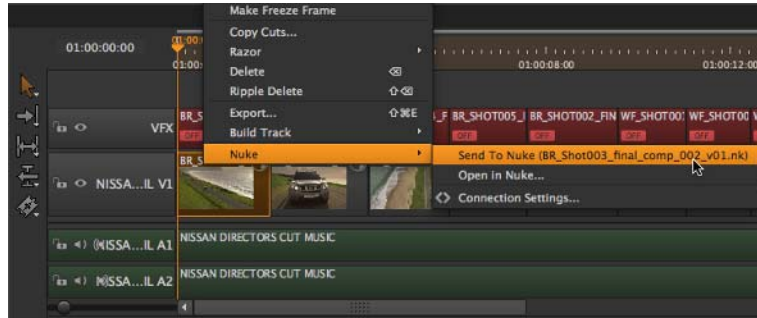
**NOTE:** If you selected **Open each item in its own Nuke instance**, in the example above you'd get three clips, each in a separate Nuke.

### Send to Nuke

**Send to Nuke** enables you to add clips and track items to existing Nuke scripts that are connected to Hiero using Hiero<>Nuke. **Send to Nuke** operates similarly to **Open in Nuke**, in that clips are opened independently and track items are opened with additional nodes, but they are added to an existing script.

1. Select the required clip(s) or track item(s).
2. Right-click a highlighted item and select **Send to Nuke**.

A list of available scripts is displayed in the submenu.

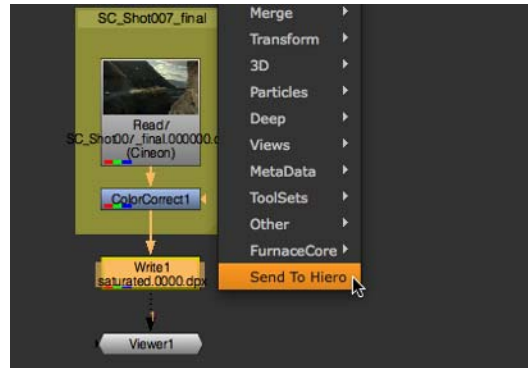


3. Select the required script to receive the additional items.  
Hiero adds the items to the selected script.

### Send to Hiero

**Send to Hiero** enables you to send rendered Write nodes from Nuke back into Hiero using Hiero<>Nuke.

1. Select the required Write node(s) in Nuke's Node Graph.
2. Right-click a highlighted node and select **Send to Hiero**.



The selected files are added to Hiero in a new Nuke bin.

### Using Hiero<>Nuke in HieroPlayer

Hiero projects loaded in HieroPlayer are read-only, but Hiero<>Nuke creates a link between the two applications in the same way.

Because the project was exported from Hiero, important information is stored in tags on the individual track items. The tags contain the filepath to the Nuke script for each shot as well as the location of the source files and the path to the VFX clips that don't exist yet.

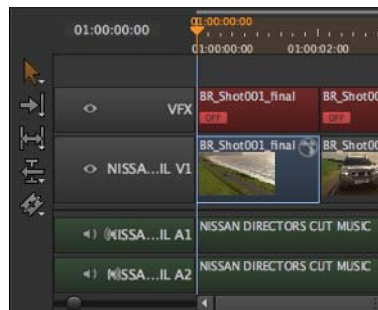
## Open in Nuke

**Open in Nuke** enables you to open track items using an existing Nuke script stored in a track item tag using Hiero<>Nuke.

### To open a track item in Nuke

1. Select the track item(s) in the timeline view.
2. Right-click a highlighted item and select **Open in Nuke**.

The selected track items are opened in the Nuke application specified in the **Preferences > Nuke / Export > Nuke Path** field. Each track item is opened in a separate Nuke.



This selection from HieroPlayer...



...Opened in Nuke

3. Once you've completed the VFX work in Nuke, render the clip using the Write node supplied in the script. The new clip is automatically picked up by HieroPlayer, superseding the placeholder clip.
4. You can create multiple versions of the same clip by incrementing the filepath in the Write node's Properties panel:
  - Use the **Alt+↓↑** hotkeys to increment the version up and down as required.
  - OR
  - Manually edit the file name. For example:  
/renders/BR\_SHOT001\_FINAL\_comp\_v02.mov
5. You can create as many versions of a clip as required and cycle through the available files in HieroPlayer to select the latest version. See [Using Versions](#) for more information.

## Send to Nuke

**Send to Nuke** enables you to add a track item to an existing Nuke script that is connected to HieroPlayer using Hiero<>Nuke. **Send to Nuke** operates similarly to **Open in Nuke**, in that track items are opened with additional nodes, but they are added to an existing script.

1. Select the required track item.
2. Right-click the highlighted item and select **Send to Nuke**.  
A list of available scripts is displayed in the submenu.
3. Select the required script to receive the additional track item.  
HieroPlayer adds the item to the selected script.



This selection from HieroPlayer...



...Sent to Nuke

You can create as many versions of a clip as required and cycle through the available files in HieroPlayer to select the latest version. See [Using Versions](#) for more information.

## Advanced Send to Nuke

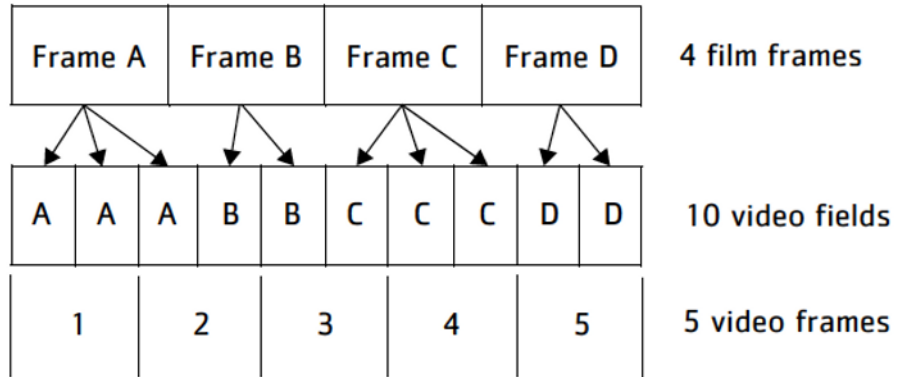
Hiero provides a single clip or bin **Advanced Send to Nuke** option along with its other export functionality.

## About 3:2 Pulldown

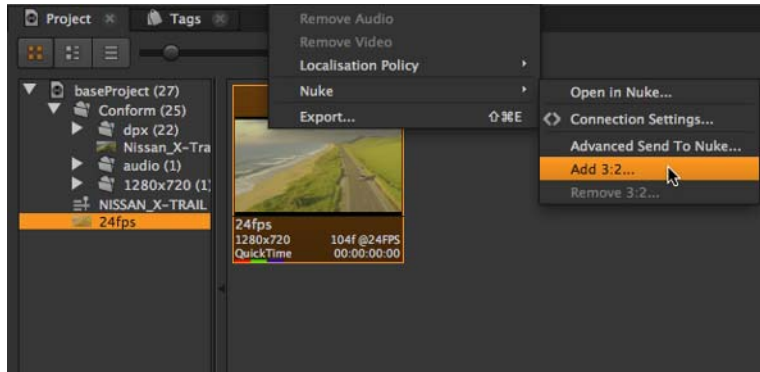
3:2 pulldown is the process of converting 24 fps film to 29.97 fps interlaced video and vice-versa. Hiero uses Nuke's Add and Remove 3:2 Pulldown nodes to achieve this, but only offers the option to do so when the selected clip is 24 or 30 fps.

When adding 3:2 pulldown, the film is first slowed down 0.1% to match the speed difference between 29.97 fps and 30 fps. Then, film frames are distributed across video fields in a repeating 3:2 pattern in order to make 24 film frames fill the space of 30 video frames per second:

- The first frame of film is copied to 3 fields of video,
- the second frame of film is copied to 2 fields of video,
- the third frame of film is again copied to 3 fields,
- the fourth frame of film is copied to 2 fields, and so on.

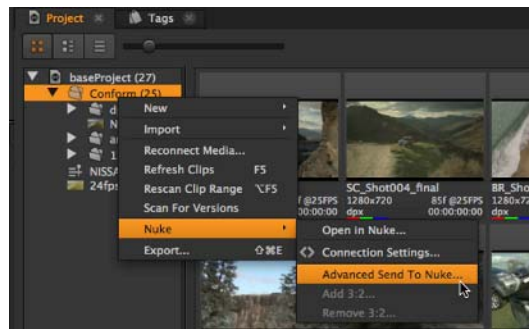


The opposite process is used to remove 3:2 pulldown. Hiero allows you to employ 3:2 pulldown from inside the **Advanced Send to Nuke** dialog, or directly from a bin clip:

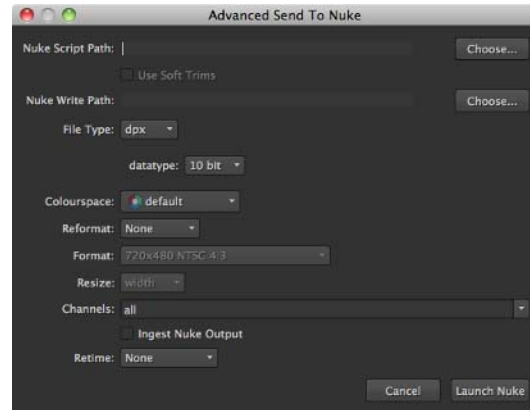


To send a clip or bin to Nuke using Advanced send:

1. Locate the required source clip or bin in the bin view.
2. Right-click the clip or bin and select **Advanced Send to Nuke**.



The **Advanced Send to Nuke** dialog displays.



3. Enter the output script name and location in **Nuke Script Path** field.
4. If the clips you're exporting have Soft Trims enabled, check **Use Soft Trims** to adjust the frame range accordingly.
5. Enter the Nuke output location in the **Nuke Write Path** field.
6. Select the **File Type** to transcode to within Nuke. The available transcode options depend on the **File Type** selected.
7. Set the controls common to all file types as described in [Round-Tripping Using the Export Dialog](#).
8. If you intend to bring the transcoded clips back into Hiero, check **Ingest Nuke Output**.
9. If your selection requires retiming, choose the retime to apply:
  - **None**—no retimes are applied.
  - **Add 3:2 Pulldown**—converts 24 fps clips to 30 fps clips.
  - **Remove 3:2 Pulldown**—converts 30 fps clips to 24 fps clips.
  - **To Timebase**—enter the retime to apply as frames per second.
  - **Speed**—enter the retime to apply as a percentage.



**NOTE:** The 3:2 Pulldown options are only displayed when applicable.

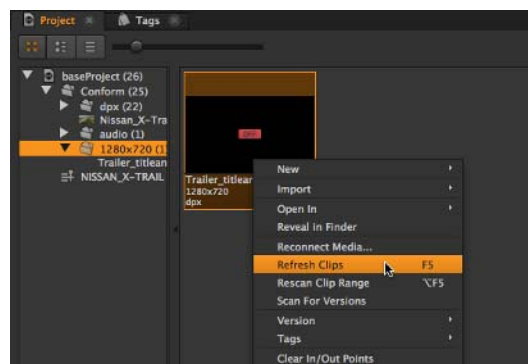
10. Click **Launch Nuke** to send the clip to the Nuke specified in **Preferences > Nuke / Export > Nuke Path**.

Nuke starts up with Read and Write nodes for each clip incorporating the selected **File Type** settings and **Write Path**.



**NOTE:** The Nuke script is saved in the directory specified as the **Write Path**.

When **Ingest Nuke Output** is enabled, offline placeholders are added to the bin view. Once the VFX work is complete, right-click a placeholder and select **Refresh Clips**, or press **F5**, to ingest the VFX clips.



## Transcoding

Transcoding in Hiero can use a specified external Nuke application, HieroNuke, or a specified background render process to convert one file format to another.

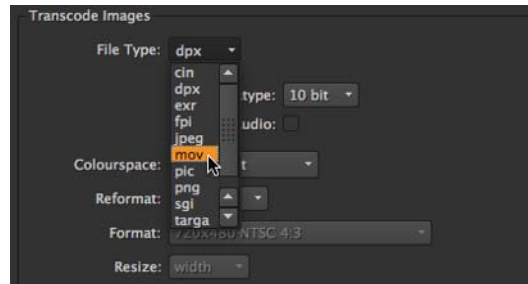


**TIP:** If you don't want to use HieroNuke, select the required Nuke application using the **Preferences > General** tab as described in [Workspace Preferences](#).

### Transcoding a Sequence or Shots

#### Transcoding a sequence

1. Select a sequence in the bin view and navigate to **File > Export**. The **Export** dialog displays.
2. Select **Process as Sequence** and click the **Content** column to select a format to transcode to using the **File Type** dropdown.



The controls exposed depend on the transcode you're applying.

3. Complete the **File Type** specific controls. For example, selecting **.dpx** exposes the **datatype**, **timecode**, and **edge\_code** settings.
4. Complete the general controls common to all file types:
  - **Include Audio**—when enabled, any audio tracks are exported alongside the video.
  - **Colourspace**—use the dropdown to set the colourspace to render, such as **linear**, **REDLog**, or **raw**.
  - **Reformat**—select the required reformatting option to enable the **Format** dropdown.
  - **Format**—sets the format to render out in Nuke, such as **1920x1080 HD 1080**.

Select **Custom...** to create formats that don't appear in the list of presets.

- **Resize**—sets the method by which you want to preserve or override the original aspect ratio:
    - **width**—scales the original until its width matches the format's width. Height is then scaled in such a manner as to preserve the original aspect ratio.
    - **height**—scales the original until its height matches the format's height. Width is then scaled in such a manner as to preserve the original aspect ratio.
    - **fit**—scales the original until its smallest side matches the format's smallest side. The original's longer side is then scaled in such a manner as to preserve original aspect ratio.
    - **fill**—scales the original until its longest side matches the format's longest side. The input's shorter side is then scaled in such a manner as to preserve original aspect ratio.
    - **distort**—scales the original until all its sides match the lengths specified by the format. This option does not preserve the original aspect ratio, so distortions may occur.
5. Select the **Channels** to export from the dropdown. The default, **all**, exports all channels in the image.

If you want to export a non-standard channel, type the name of the channel into the field manually.


6. Select the **Retime Method** to apply, if applicable.
7. Check **Keep Temporary Nuke Script** if you require the **.nk** files after the transcode operation.
8. Enable the **Burn-in Gizmo** to burn-in text using a Nuke gizmo. Click **Edit** to define the information applied during burn-in.  
See [Adding Burn-in Text to Exports](#) for more information.
9. Specify any **Additional Nodes** required during export by clicking **Edit**.  
See [Adding Additional Nuke Nodes During Export](#) for more information.
10. If you set In and Out points on the sequence, select **Range > In/Out Points** to export only the specified range.
11. Set the **Version** number, **Tracks For Export**, and **Tag Filter**, if applicable.




**NOTE:** See [Using Versions](#) for more information on how versioning works in Hiero.

12. If you're transcoding using a render farm, select the renderer from the **Render background task** dropdown.  
Hiero requires a Python script to pass exports to your render farm of choice. Scripts must be located in specific directories, dependent on platform, as listed in [Running Python During Startup](#). If no scripts exist, the dropdown is disabled.  
Some example scripts are included in the Hiero package in the following directories:
  - On Mac: /Applications/Hiero 1.7v1/Hiero 1.7v1.app/Contents/Plugins/site-packages/hiero/examples/
  - On Linux: /usr/local/Hiero 1.7v1/Plugins/site-packages/hiero/examples/
  - On Windows: drive letter:\Program Files\The Foundry\Hiero 1.7v1\plugins\site-packages\hiero\examples
13. Click **Export**.  
The **Export Queue** window displays an estimate of how long each component of the export is expected to take.  
Once the export is complete, the file structure specified in the shot template is created containing the transcoded files.

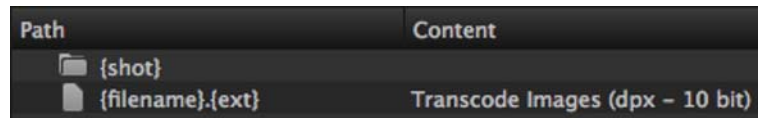


**TIP:** Click the  icon to reveal the exported file in a browser window.

## Transcoding shots

1. Select **Process as Shots** and use the defaults or build a shot template using the **Path** and **Contents** fields and the  buttons.

For example:



Creates a folder for each timeline item {shot}, containing a clip {filename} with the required file extension {ext}.

2. Enter the **Export To** directory or click **Choose...** and browse to the location.

The **Export To** directory is the starting point from which the shot template builds your shot hierarchy.

3. Complete the **File Type** specific and general controls common to all file types as described in [Transcoding a sequence](#).
4. Set the clip **Handles**:
  - **Clip Length**—exports the full clip length available, as if the clip was opened as a Viewer.
  - **Cut Length**—exports only the cuts included on the timeline.



**NOTE:** Selecting **Cut Length** allows you to add handles to each clip, up to the maximum available source clip length.

5. Check **Apply Retimes** to export any retimes present on the timeline.
6. Set how clip **Start Frames** are derived using the dropdown menu:
  - **Source**—use the source clip's start frame.
  - **Custom**—specify a start frame for all clips using the field to the right.
7. Set the **Version** number, **Tracks For Export**, and **Tag Filter**, if applicable.



**NOTE:** See [Using Versions](#) for more information on how versioning works in Hiero.

8. If you're transcoding using a render farm, select the renderer from the **Render background task** dropdown.

Hiero requires a Python script to pass exports to your render farm of choice. Scripts must be located in specific directories, dependent on platform, as listed in [Running Python During Startup](#). If no scripts exist, the dropdown is disabled.

Some example scripts are included in the Hiero package in the following directories:


- On Mac: /Applications/Hiero 1.7v1/Hiero 1.7v1.app/Contents/Plugins/site-packages/hiero/examples/
- On Linux: /usr/local/Hiero 1.7v1/Plugins/site-packages/hiero/examples/
- On Windows: drive letter:\Program Files\The Foundry\Hiero 1.7v1\plugins\site-packages\hiero\examples

9. Click **Export**.

The **Export Queue** window displays an estimate of how long each component of the export is expected to take.

Once the export is complete, the file structure specified in the shot template is created containing the transcoded files.

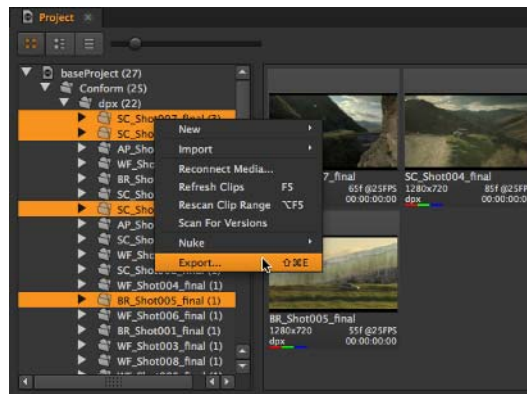


**TIP:** Click the  icon to reveal the exported file in a browser window.

## Transcoding from the Bin View

To transcode directly from the bin view:

1. Select the bin(s) to export from the bin view.
2. Right-click a highlighted bin and select **Export**.



The **Export** dialog displays.

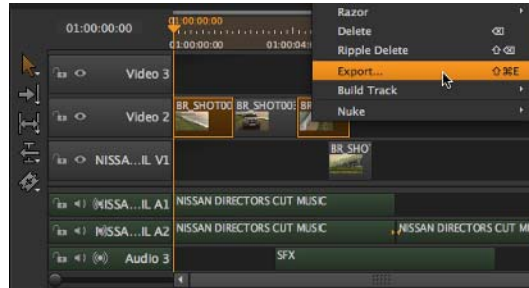
3. Select **Process as Clips** and modify the shot template, if required.
4. Follow the steps under [Transcoding a Sequence or Shots](#) to complete the export.

## Transcoding Timeline Selections

Transcoding an entire timeline can be time consuming, or even unnecessary, if all you're looking for is a new version of a selection of track items.

To transcode a selection of clips from a timeline:

1. Select the required track items on the timeline.
2. Right-click a highlighted item and select **Export**.



The **Export** dialog displays.

3. Refer to [Transcoding a sequence](#) or [Transcoding shots](#) as appropriate, to complete the export.

## Ad Hoc Exports

This section covers exports that you might not perform on a per project basis, such as EDL or XML exports.

### Exporting EDLs and XMLs

Hiero supports export to EDL and XML using very similar methods, the main difference being that EDL doesn't support multiple video tracks in a single file whereas XML does.

To export to EDL or XML:

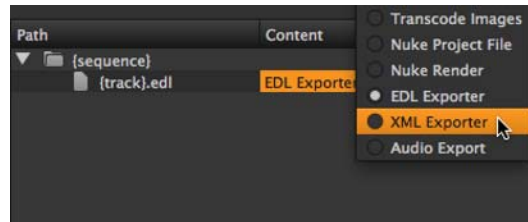
1. Select a sequence in the bin view and navigate to **File > Export**.


The **Export** dialog displays.

2. Select **Process as Sequence** from the Processors list.
3. Enter the **Export To** directory or click **Choose...** and browse to the location.

The **Export To** directory is the starting point from which the shot template builds your shot hierarchy.

- Click the **Contents** column to display a list of available presets and the associated **Export Controls**.



**NOTE:** You can build a custom shot template using **Path** tokens, the **Contents** field, and the  buttons.

- Select the **EDL Exporter** or **XML Exporter** as required.



**NOTE:** When exporting EDLs, check the additional EDL Exporter controls if required:

- **Include Absolute Path**—adds the full filepath for each clip to the EDL comments field.
- **Truncate Reel Name**—restricts the **Reel** name to eight characters.
- **From Clip Name**—define the text appended to “from” comment fields in EDLs, such as **\*FROM CLIP NAME**.



**NOTE:** EDLs only support one video track per file. If you have more than one track, include the **{track}** token in the shot template to write out an EDL for each track preset.


For example, **{filename}\_{track}.{ext}** might produce a separate EDL for each track on your timeline called **myTimeline\_Video1.edl**, **myTimeline\_Video2.edl**, and so on.

- If you set In and Out points on the sequence, select **Range > In/Out Points** to export only the specified range.
- Set **Start Frame** to **Custom** if you want to specify a particular frame.
- Set the **Version** number and **Tracks For Export**.
- Click **Export**.

The **Export Queue** window displays an estimate of how long the export is expected to take.

Once the export is complete, the file structure specified in the shot template is created. You can then import the EDL or XML into other applications.



**TIP:** Click the  icon to reveal the exported file in a browser window.

## Using the Copy Exporter

Copying media from various locations is very time consuming and can waste disk space. Hiero's Copy Exporter allows you to consolidate sequences containing only your project media in a named file structure using the shot template.





To copy media to a named location:

1. Select a sequence in the bin view and navigate to **File > Export**.

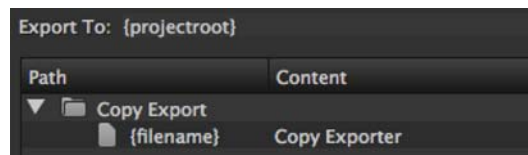
The **Export** dialog displays.

2. Select **Process as Shots** from the Processors list.
3. Enter the **Export To** directory or click **Choose...** and browse to the location.

The **Export To** directory is the starting point from which the shot template builds your shot hierarchy.

4. Create a new preset by clicking  or copy an existing preset.
5. Build a custom shot template using **Path** tokens, the **Contents** field, and the    buttons.

An example shot template is shown below:



6. Set the **Handles**, if required:
  - **Clip Length**—exports the full clip length available, as if the clip was opened from the bin.
  - **Cut Length**—exports only the cuts included on the timeline.



**NOTE:** Selecting **Cut Length** allows you process retimes and add handles to each clip, up to the maximum available source clip length.

7. Check **Apply Retimes**, if **Cut Length** is enabled, to export any retimes present on the timeline.
8. Set how clip **Start Frames** are derived using the dropdown menu:
  - **Source**—use the source clip’s start frame.
  - **Custom**—specify a start frame for all clips using the field to the right.
9. Set the **Version** number, **Tracks for Export**, and **Tag Filter**, if applicable.




**NOTE:** See [Using Versions](#) for more information on how versioning works in Hiero.

10. Click **Export**.

The **Export Queue** window displays an estimate of how long the export is expected to take.

Once the export is complete, the file structure specified in the shot template is created.



**TIP:** Click the  icon to reveal the exported file in a browser window.

## 13 CUSTOMISING HIERO AND HIEROPLAYER

This chapter provides a basic overview and some simple examples to get you started, but more information is available in the dedicated Python API document included in the Hiero package. See **Help > Python Dev Guide** for more information.

### Environment Variables

Environment variables are used to store values that influence the behaviour of Hiero and HieroPlayer, such as adding additional filepaths to check at startup for plug-in scripts.

#### Setting Environment Variables

##### On Mac OS X and Linux

1. The first step is to determine the type of the shell you're using. Launch a terminal and enter:

```
echo $SHELL
```

Your shell type is printed to the screen. For example, `/bin/bash` indicates that your shell is "bash".

2. Depending on the output of the `$SHELL` command, do one of the following:

- **csh** or **tcsh**—add the following command to the `.cshrc` or `.tcshrc` file in your home directory:

```
setenv VARIABLE value
```

Replace `VARIABLE` with the name of the environment variable and value with the value you want to give it, for example:

```
setenv HIERO_PLUGIN_PATH /SharedDisk/Hiero
```

- **bash** or **ksh**—add the following command to the `.bashrc` or `.kshrc` file in your home directory:

```
export VARIABLE=value
```

Replace `VARIABLE` with the name of the environment variable and value with the value you want to give it, for example:

```
export HIERO_PLUGIN_PATH=/SharedDisk/Hiero
```



**NOTE:** The steps above set the environment variable until you manually remove it from the file in your home directory. If you want to set a variable for a single session, you can simply type the variable in the terminal then run Hiero from the same session.

### On Windows

1. Right-click on **My Computer** and select **Properties**.
2. Click the **Advanced** tab.
3. Click the **Environment Variables** button.  
The **Environment Variables** dialog opens.
4. Click the **New** button under either **User variables** or **System variables**, depending on whether you want to set the variable for the current user or all users.



**NOTE:** You must have administrator privileges to set system-wide variables.

5. In the **Variable** name field, enter the name of the environment variable you want to set.
6. In the **Value** field, enter the value for the variable. The value can be a directory path, for example.
7. Click **OK** to save the variable.

The following table lists the environment variables that Hiero recognises:

Environment Variable	Description
_GL_SYNC_DISPLAY_DEVICE	On Linux, set this variable to the name of screen device to synchronise in dual screen setups. See <a href="#">Syncing to VBlank</a> for more information.
HIERO_DISABLE_THUMBNAIL_CACHE	Set this variable to TRUE to stop Hiero caching thumbnails. <b>Note:</b> This variable does not clear the cache, you must remove cached files manually.
HIERO_PLUGIN_PATH	Set this variable to the location of additional scripts to run at startup. You can use <b>&lt;folder&gt;</b> to point to hidden folders, for example <b>.myPlugins</b> . For example, you could create a facility-wide location to share presets and use this variable to point multiple Hiero's to it. See <a href="#">Sharing Presets</a> for more information. Use the following method to display set paths: <pre>print hiero.core.pluginPath()</pre>
HIERO_SINGLE_THREADED_PLAYBACK	This variable launches Hiero in single-thread mode, which can solve playback issues on various Linux Fedora flavours.
FOUNDRY_LOG_FILE	This variable specifies the location of Hiero's logfile. If you don't specify a logfile, all output is to screen.

Environment Variable	Description
FOUNDRY_LOG_LEVEL	<p>This variable sets the level of logging Hiero produces during operation. There are four levels of detail, on a sliding scale from minimal to verbose:</p> <ul style="list-style-type: none"> <li>• error</li> <li>• warning</li> <li>• message</li> <li>• verbose</li> </ul> <p><b>Note:</b> Setting the logging level to verbose can produce large log files when FOUNDRY_LOG_FILE is specified.</p>
OCIO	<p>Set this variable to the location of your OCIO configuration file for colour conversion.</p> <p><b>Note:</b> If you plan to use the OCIO config file specified in Hiero or HieroPlayer, ensure that the <b>Preferences &gt; Colour Management &gt; Use OCIO nodes when exporting in Nuke</b> checkbox is enabled.</p>

## Sharing Presets

Hiero and HieroPlayer support facility-wide preset sharing by pointing multiple seats to a single network location using the `HIERO_PLUGIN_PATH`. As long as the folder hierarchy mirrors what the application expects, you can place this repository anywhere on your network.

To setup sharing:

1. Create the shared repository directory, for example:

```
/Volumes/myFacility/Shared/
```

2. Follow the instructions under [Setting Environment Variables](#) to point individual machines to the shared location. For example, if you're using a **bash** shell, you could use:

```
export HIERO_PLUGIN_PATH=/Volumes/myFacility/Shared/
```

Any file that can be read locally can be placed in the shared path. For example:

```
/Volumes/myFacility/Shared/TaskPresets/Processors/  
hiero.exporters.FnTimelineProcessor.TimelineProcessor/  
MyPreset.xml
```

## Startup Projects

Hiero and HieroPlayer search `<path>/StartupProjects/Hiero`, `<path>/StartupProjects/HieroPlayer` and `<path>/Templates` for preset projects

saved as `.hrox` files. See [Mac OS X](#), [Linux](#), and [Windows](#) for a description of the `<path>` variable by platform.

Projects placed in these folders behave differently, depending on which folder they are read from:

- **StartupProjects/Hiero** or **HieroPlayer**—projects in these folders are displayed in the bin view at startup and are read only. An example project, **Tag Presets**, is included in the **Tags** tab.
- **Templates**—projects in this folder appear in a dropdown menu when you open a new project. Select the template to use for the new project.



**NOTE:** You may need to create the **StartupProjects/Hiero**, **StartupProjects/HieroPlayer**, and **Templates** folders manually in the chosen path.

To remove a startup project, either:

- Remove it from `<path>/StartupProjects/Hiero`, `<path>/StartupProjects/HieroPlayer` or `<path>/Templates`, or
- Rename the file extension so the application doesn't recognise it on startup. For example, `myStartup.hrox_hidden`.

To modify a startup project:

1. Load the project using **File > Open**.
2. Make any required edits and save over the original in the same location.  
The edited project loads at startup.

## Using the Python API

Hiero and HieroPlayer ship with a comprehensive Python application programming interface (API) enabling you to perform most user interface actions using Python scripting.

This chapter provides a basic overview and some simple examples to get you started, but more information is available in the dedicated Python API document included in the Hiero package. See **Help > Python Dev Guide** for more information.

## Running Python During Startup

On startup, Hiero and HieroPlayer scan various directories for Python scripts that customise the behaviour of the application. These scripts can be downloaded from online resources and placed in specific locations on disk, depending on the platform you're using.

If you're familiar with Python scripting, you can place custom startup scripts in the same locations, though bear in mind that you should take care as mistakes can produce performance issues.



**NOTE:** Some example scripts are included in the application package in the following directories:

- On Mac:  
/Applications/Hiero 1.7v1/Hiero 1.7v1.app/Contents/Plugins/site-packages/hiero/examples/  
/Applications/HieroPlayer 1.7v1/HieroPlayer 1.7v1.app/Contents/Plugins/site-packages/hiero/examples/
- On Linux:  
/usr/local/Hiero 1.7v1/Plugins/site-packages/hiero/examples/  
/usr/local/HieroPlayer 1.7v1/Plugins/site-packages/hiero/examples/
- On Windows:  
drive letter:\Program Files\The Foundry\Hiero 1.7v1\plugins\site-packages\hiero\examples  
drive letter:\Program Files\The Foundry\HieroPlayer 1.7v1\plugins\site-packages\hiero\examples

At startup, Hiero and HieroPlayer search **<path>/Python/Startup** and **<path>/Python/StartupUI** for any Python **.py** modules or packages containing **\_init\_.py**. Scanning is done in two passes—all the Startup folders are searched and then all the StartupUI folders.

Each package or module discovered is imported and added to the built-in package **hiero.plugins**.



**NOTE:** Python startup scripts are imported in alphabetical order so you can force ordering if necessary.

The **<path>** varies by platform as follows:

#### Mac OS X

- /Applications/Hiero 1.7v1/Hiero 1.7v1.app/Contents/Plugins
- /Applications/HieroPlayer 1.7v1/HieroPlayer 1.7v1.app/Contents/Plugins
- /Library/Application Support/TheFoundry/Hiero
- ~/Library/Application Support/TheFoundry/Hiero
- ~/.hiero

**Linux**

- /usr/local/Hiero1.7v1/Plugins
- /usr/local/HieroPlayer1.7v1/Plugins
- ~/.hiero

**Windows**

- drive letter:\Program Files\Hiero\plugins\hieroscripts
- drive letter:\Program Files\HieroPlayer\plugins\hieroscripts
- drive letter:\Program Files (x86)\Hiero\plugins\hieroscripts
- drive letter:\Program Files (x86)\HieroPlayer\plugins\hieroscripts

You can specify any number of user-defined paths using the environment variable HIERO\_PLUGIN\_PATH, separating them with : just like the standard unix PATH environment variable and Nuke's NUKE\_PATH. See [Setting Environment Variables](#) for more information.

## Using the Script Editor

Hiero and HieroPlayer include a Python **Script Editor**, accessible from the user interface, allowing you to enter Python statements directly.

To access the Script Editor:


1. Navigate to **Window > Script Editor**.  
The **Script Editor** displays.
2. Enter scripts in the lower half of the editor and press **Ctrl/Cmd + Enter** to execute the script.











The results are displayed at the top of the editor. A simple example might be:

```
from hiero.core import *
bin = projects()[-1].clipsBin()
bin.addItem(Bin("Plates"))
bin["Plates"].importFolder("/Footage/Hiero/finalshots")
```

Which imports **hiero.core**, defines **bin** in the last project opened, creates a bin called **Plates** at root level, and imports the specified folder into **Plates**.

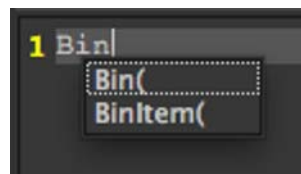
Script Editor buttons and commands are described below:

Icon	Hotkeys	Description
	Ctrl/Cmd+[	Go to the previous script.

Icon	Hotkeys	Description
	Ctrl/Cmd+] ]	Go to the next script.
	n/a	Clear the script history.
	n/a	Load and execute a script.
	n/a	Load an existing script.
	n/a	Save a script as a .py file.
	Ctrl/Cmd+ enter	Run the current script.
	n/a	Show the input pane only.
	n/a	Show the output pane only.
	n/a	Show both the input and output panes.
	Ctrl/Cmd+ Backspace	Clear the output pane.

The Script Editor also features auto-completion and help for commands. Classes, attributes and so on are discoverable by:

- Entering the beginning of an object name and pressing the **Tab** key. For example, typing **Bin** and pressing **Tab** displays a list of objects starting with Bin:



- Using the **help** command for a known object. For example, **help(Clip)** returns a list of useful information on Clip:

```

Script Editor
from hiero.core import *
# Result: help(Clip)
# Result: Help on class Clip:

class Clip(SequenceBase)
| Object representing a clip.
|
| Initialization:
|   Clip(mediaSource)
|   Clip(mediaSource, first, last)
|   mediaSource may be a MediaSource object or a string containing the
|
| help(Clip)
    
```

Scroll down in the top pane to see more information relating to **Clip**.

- Using the **dir** command for a known object.  
For example, **dir(Project)** returns a concise list of useful information on Project:

```

Script Editor
dir(Project)
# Result: ['__class__', '__copy__', '__delattr__', '__dict__', '__doc__',
'__eq__', '__format__', '__go__', '__getattr__', '__gt__',
'__hash__', '__init__', '__le__', '__lt__', '__ne__', '__new__',
'__reduce__', '__reduce_ex__', '__repr__', '__setattr__', '__sizeof__',
'__str__', '__subclasshook__', 'audioTracksItems', 'audioTracks',
'beginUndo', 'bins', 'buildTrackName', 'cancelUndo',
'clearUnusedLocalFiles', 'clips', 'clipsBin', 'close', 'deletable',
'editable', 'endUndo', 'extractSettings', 'guid', 'isLocalizationEnabled',
'isNull', 'isRestricted', 'kAllProjects', 'kStartupProjects',
'kUserProjects', 'lutSettingEdit', 'lutSettingBit', 'lutSettingFloat',
...
| dir(Project)
    
```



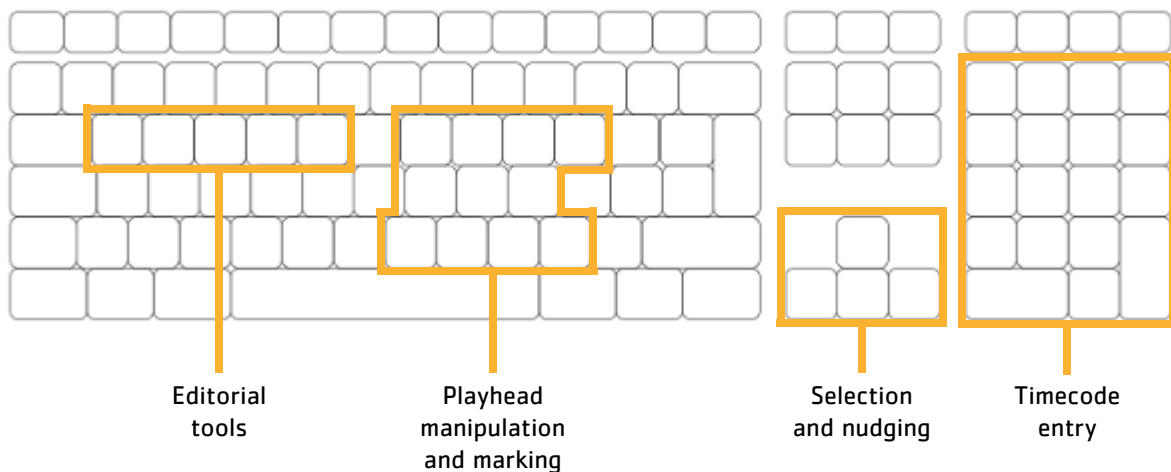
**NOTE:** The last entry in the Script Editor is restored at startup by default, but you can disable this behaviour by navigating to **Preferences > General** and deselecting **Save and restore script editor history**.

For more information on Python scripting, see **Help > Python Dev Guide**.














# APPENDIX A






## Hiero and HieroPlayer Hotkeys






This appendix lists the hotkeys used by both applications, along with their function. In general, contiguous areas of the keyboard are assigned to related functionality. The left-hand keys on a QWERTY keyboard are used for tool selection and actions, the right-hand side for playhead manipulation including source/record and insert/overlay, the arrow keys for selection and nudging, and the numeric pad for timecode entry.





Hotkeys	Button	Menubar	Function
<b>Viewer</b>			
Shift + Ctrl/Cmd + 1	n/a	View > Zoom to Actual Size	Zoom the contents of the Viewer to actual size.
Shift + Ctrl/Cmd + 2	n/a	View > Zoom to Half Size	Zoom the contents of the Viewer to half size.
H	n/a	View > Zoom to Fill	Fit the current clip to the height of the Viewer.
F	n/a	View > Zoom to Fit	Zoom to fit the clip to the Viewer.
= (equals)	n/a	View > Zoom In	Zoom in to the Viewer.
- (minus)	n/a	View > Zoom Out	Zoom out of the Viewer.
Ctrl/Cmd + F	n/a	View > Full Screen	Toggle Full Screen mode.
Ctrl/Cmd + Shift + F	n/a	View > Full Quality 1:1	Toggle Full Screen mode at Full Quality 1:1 zoom.
Esc	n/a	n/a	Exit full screen mode.
E		View > Clipping Warning	Toggle the Level Warning tool on and off.
I		View > Mark In	Set the In Point at the current frame.






Hotkeys	Button	Menubar	Function
<b>O</b>		View > Mark Out	Set the Out Point as the current frame.
<b>Alt + I</b>	n/a	View > Clear In Point	Clear the In point for the current clip or timeline.
<b>Alt + O</b>	n/a	View > Clear Out Point	Clear the Out point for the current clip or timeline.
<b>Alt + U</b>	n/a	View > Clear In and Out Points	Clear the In and Out points for the current clip or timeline.
<b>Home</b>		View > Go to Start	Go to the start of all clips.
<b>End</b>		View > Go to End	Go to the end of all clips.
<b>Shift + I</b>	n/a	View > Go to In Point	Go to the In Point in the current clip.
<b>Shift + O</b>	n/a	View > Go to Out Point	Go to the Out Point in the current clip.
<b>, (comma) (K + J)</b>		View > Frame Backwards	Skip one frame backwards.
<b>. (full stop) (K + L)</b>		View > Frame Forwards	Skip one frame forwards.
<b>Shift + , (comma)</b>		View > Skip Backwards	Skip backwards by the frame increment value specified in the Viewer tools.
<b>Shift + . (full stop)</b>		View > Skip Forwards	Skip forwards by the frame increment value specified in the Viewer tools.
<b>Alt + , (comma)</b>		View > Previous Edit	Go to the previous clip in the Viewer.
<b>Alt + . (full stop)</b>		View > Next Edit	Go to the next clip in the Viewer.
<b>Alt + Shift + , (comma)</b>	n/a	View > Previous Tag	Go to previous frame tag.
<b>Alt + Shift + . (full stop)</b>	n/a	View > Next Tag	Go to next frame tag.
<b>Space</b>		View > Play	Play the clip or sequence currently in the Viewer.
<b>P</b>		n/a	Pause RAM caching in the Viewer.
<b>J</b>		View > Play Backward	Play clip or sequence currently in the Viewer backward (click multiple times to increase playback speed).
<b>K</b>		View > Pause	Pause playback.

Hotkeys	Button	Menubar	Function
<b>L</b>		View > Play Forward	Play clip or sequence currently in the Viewer forward (click multiple times to increase playback speed).
<b>Return</b> (main keyboard)	n/a	View > Swap Inputs	Controls the AB inputs: <ul style="list-style-type: none"> <li>• <b>Stack</b> - swaps which input is visible.</li> <li>• <b>Horizontal</b> - swaps the inputs horizontally.</li> <li>• <b>Vertical</b> - swaps the inputs vertically.</li> </ul>
<b>Alt + left-click + drag</b> <b>(middle-click and drag on Linux)</b>	n/a	n/a	Pan the contents of the Viewer.
Scroll wheel (over Viewer or Viewer timeline)	n/a	n/a	Zoom the Viewer or Viewer timeline.
Scroll wheel <b>middle-click + drag</b> (over Viewer timeline or timeline)	n/a	n/a	Zoom the Viewer timeline to the indicated frame range.
Scroll wheel <b>Alt + middle-click + drag</b> (over Viewer or Viewer timeline)	n/a	n/a	Zoom the contents of the Viewer or Viewer timeline.
<b>middle-click</b> (over Viewer timeline or timeline)	n/a	n/a	Zoom to fit the Viewer timeline to Viewer contents. <b>Note:</b> If your mouse preferences are not set to <b>Button 3</b> for the middle mouse button, you may have to use <b>Ctrl/Cmd + middle-click</b> .
<b>PgUp</b>		n/a	Scroll up and down through available layers in the Viewer.
<b>PgDn</b>		n/a	
<b>R, G, B, A, Y</b>		View > Channels	Set the Viewer output channel.
<b>W</b>		View > Toggle SplitWipe	Toggle the SplitWipe compare mode on and off.
<b>\</b> (back slash)	n/a	View > Show Overlays	Toggle the HUD overlays.
<b>Alt + close Viewer</b>		n/a	Close the Viewer and any linked timeline and spreadsheet panes.
<b>Bin</b>			
<b>Ctrl/Cmd + B</b>	n/a	Project > New Bin	Create a new bin in the current bin.
<b>Ctrl/Cmd + Y</b>	n/a	Project > New Tag	Create a new tag in the current bin (tags can only be created in the <b>Tags</b> tab).

Hotkeys	Button	Menubar	Function
Ctrl/Cmd + N	n/a	Project > New Sequence	Create a new sequence in the current bin.
Ctrl/Cmd + X	n/a	Edit > Cut	Cut the selected item(s) and place in the buffer.
Ctrl/Cmd + C	n/a	Edit > Copy	Copy the selected item(s) to the buffer.
Ctrl/Cmd + V	n/a	Edit > Paste	Paste item(s) from the buffer.
Backspace / Delete	n/a	Edit > Delete	Delete selected item(s).
Ctrl/Cmd + A	n/a	Edit > Select All	Select all files in the current bin.
Shift + Ctrl/Cmd + A	n/a	Edit > Clear Selection	Deselect all files in the current bin.
Ctrl/Cmd + D	n/a	Edit > Duplicate	Duplicate the selected object(s).
<b>Spreadsheet</b>			
Alt + left-click	n/a	n/a	Move the playhead to the selected clip's <b>In</b> point on the timeline.
Alt + double left-click	n/a	n/a	Move the playhead to the selected clip's <b>In</b> point on the timeline and zoom to fit the clip in the timeline view.
<b>Timeline</b>			
Q		n/a	Cycles between the available move tools: <ul style="list-style-type: none"> <li>• <b>Multi Tool</b></li> <li>• <b>Move/Trim</b></li> <li>• <b>Select</b></li> </ul>
W		n/a	Cycles between the available selection tools: <ul style="list-style-type: none"> <li>• <b>Select Track to Right/Left</b></li> <li>• <b>Select All in Track</b></li> <li>• <b>Select All Tracks Right/Left</b></li> </ul>
E		n/a	Cycles between the <b>Slip Clip</b> and <b>Slide Clip</b> tools.
R		n/a	Cycles between the available edit tools: <ul style="list-style-type: none"> <li>• <b>Roll Edit</b></li> <li>• <b>Ripple Edit</b></li> <li>• <b>Retime Clip</b></li> </ul>
T		n/a	Cycles between the available razor tools: <ul style="list-style-type: none"> <li>• <b>Razor</b></li> <li>• <b>Razor All</b></li> <li>• <b>Join</b></li> </ul>
<b>Note:</b> See <a href="#">Timeline Editing Tools</a> for more information on modal editing in Hiero and HieroPlayer.			
left-click	n/a	n/a	Select a clip including any linked tracks.
Alt + left-click	n/a	n/a	Select a clip, ignoring linked tracks (for example, audio only).
Shift + drag clip	n/a	n/a	Disable snap to transition when dragging clips.

Hotkeys	Button	Menubar	Function
<b>F</b>	n/a	View > Zoom to Fit	Zoom to fit the clips on the timeline to the available space.
<b>Backspace / Delete</b>	n/a	n/a	Remove the selected clip(s) or razor cut.
<b>Shift + Delete</b>	n/a	Timeline > Ripple Delete	Remove the selected clip(s) and ripple clips down stream to close gaps in the timeline.
<b>Ctrl/Cmd + X</b>	n/a	Edit > Cut	Cut the selected clip(s) and place in the buffer.
<b>Ctrl/Cmd + C</b>	n/a	Edit > Copy	Copy the selected clip(s) to the buffer.
<b>Ctrl/Cmd + V</b>	n/a	Edit > Paste	Paste clip(s) from the buffer to the selected track at the play-head position.
<b>Ctrl/Cmd + A</b>	n/a	n/a	Select all clips on the timeline.
<b>left-click then Shift + left-click</b>	n/a	n/a	Select all clips between the left-clicks (use <b>Shift + Alt + left-click</b> to ignore linked tracks).
<b>Alt + ↑</b>	n/a	Clip > Version Up	Cycle up through the available clip versions.
<b>Alt + ↓</b>	n/a	Clip > Version Down	Cycle down through the available clip versions.
<b>Alt + Ctrl/Cmd + ↑</b>	n/a	Clip > Max Version	Jump to the maximum known version or scan for new versions if the max version is already reached.
<b>Alt + Ctrl/Cmd + ↓</b>	n/a	Clip > Min Version	Jump to the minimum known version or scan for new versions if the min version is already reached.
<b>F5</b>	n/a	Clip > Refresh Clips	Reload the clip or track item when the source file location has not changed, such as when work has been done on the clip offline. Selecting refresh only refreshes the clip's current frame range.
<b>Alt + F5</b>	n/a	Clip > Rescan Clip Range	Similar to <b>Refresh Clips</b> , above, but rescan also checks for additional frames that may have been added to the source file and adds them to the track item's frame range.
<b>N</b>	n/a	Clip > Insert	Insert the contents of a source Viewer into the timeline at the current playhead position and ripple existing track items downstream to accommodate the change.
<b>M</b>	n/a	Clip > Overwrite	Insert the contents of a source Viewer into the timeline at the current playhead position overwriting existing track items.
<b>Shift + U</b>	n/a	Timeline > Mark Selection	Place the In and Out markers around the selected track item or track items on the timeline.
<b>U</b>	n/a	Timeline > Mark Clip	Place the In and Out markers around the upper-most timeline clip under the current playhead position.
<b>C</b>	n/a	Timeline > Razor Selected	Apply the Razor tool to the currently selected track(s) within the selected clip(s).
<b>Shift + C</b>	n/a	Timeline > Razor All	Apply the Razor tool to all tracks within the selected clip(s).
<b>drag then Alt</b>	n/a	n/a	Activate Ripple mode while dragging track item.
<b>Alt then drag</b>	n/a	n/a	Duplicate the dragged track item.
<b>Alt and drag</b>	n/a	n/a	Ripple and duplicate the dragged track item.
<b>Alt and left-click</b>	n/a	n/a	Select a clip, ignoring linked tracks.

Hotkeys	Button	Menubar	Function
Spacebar		View > Play/Pause	Play through the sequence currently in the Viewer.
Ctrl/Cmd + ←	n/a	Timeline > Nudge > Nudge Left	Trim, roll, or nudge a selected transition or track item to the left (within the available handles for trim and roll).
Ctrl/Cmd + →	n/a	Timeline > Nudge > Nudge Right	Trim, roll, or nudge a selected transition or track item to the right (within the available handles for trim and roll).
Shift + Ctrl/Cmd + ←	n/a	Timeline > Nudge > Nudge Left More	Trim, roll, or nudge a selected transition or track item to the left by the frame increment value specified in the Viewer tools (within the available handles for trim and roll).
Shift + Ctrl/Cmd + →	n/a	Timeline > Nudge > Nudge Right More	Trim, roll, or nudge a selected transition or track item to the right by the frame increment value specified in the Viewer tools (within the available handles for trim and roll).
Ctrl/Cmd + ↑	n/a	Timeline > Nudge > Nudge Up	Nudge the selected track item(s) up one track.
Ctrl/Cmd + ↓	n/a	Timeline > Nudge > Nudge Down	Nudge the selected track item(s) down one track, where possible.
Ctrl/Cmd + T	n/a	Timeline > Add Transition > Dissolve	Add a dissolve between two selected track items.
D	n/a	n/a	Enable or disable the selected clip(s) or track(s).
Alt + Ctrl/Cmd + A	n/a	Timeline > Select All in Track	Select all the track items on the current track.
Shift + Ctrl/Cmd + A	n/a	Timeline > Clear Selection	Deselect all track items.
Alt + close timeline		n/a	Close the timeline and any linked Viewer and spreadsheet panes.
<b>User Interface</b>			
Shift + F1	n/a	Window > Workspace > Conforming/Editing	Switch to Hiero's Conforming workspace or HieroPlayer's Editing workspace.
Shift + F2	n/a	Window > Workspace > Editing/Flipbook	Switch to Hiero's Editing workspace or HieroPlayer's Flipbook workspace.
Shift + F3	n/a	Window > Workspace > Reviewing	Switch to the Reviewing workspace.
Shift + F4	n/a	Window > Workspace > Timeline	Switch to the Timeline workspace.
Shift + F<num>	n/a	Windows > Workspace > Custom Workspace Name	Switch to the custom workspace associated with the number selected.
Ctrl/Cmd + , (comma)	n/a	Hiero 1.7v1 > Preferences, HieroPlayer 1.7v1 > Preferences, or Edit > Preferences	Open the <b>Preferences</b> dialog.
` (backtick)	n/a	n/a	Toggle between full screen and preset pane size for the pane currently under the mouse pointer.

Hotkeys	Button	Menubar	Function
Ctrl/Cmd + Shift + ]	n/a	n/a	Jump between tabs in the current pane.
Ctrl/Cmd + Shift + [	n/a	n/a	
Ctrl/Cmd + Alt + ` (backtick)	n/a	n/a	Cycle forwards through all current panes.
Ctrl/Cmd + Alt + Shift + ` (backtick)	n/a	n/a	Cycle backwards through all current panes.
Shift + Ctrl/Cmd + N	n/a	File > New Project	Open a new project.
Ctrl/Cmd + O	n/a	File > Open	Open an existing project.
Ctrl/Cmd + W	n/a	File > Close	Close the current project.
Ctrl/Cmd + S	n/a	File > Save	Save the current project.
Shift + Ctrl/Cmd + S	n/a	File > Save As...	Save the current project with a different name.
Ctrl/Cmd + I	n/a	File > Import Clips	Import a clip or clips.
Shift + Ctrl/Cmd + I	n/a	File > Import Folder	Import a folder or folders.
Alt + Shift + Ctrl/Cmd + I	n/a	File > Import EDL/XML	Import an EDL or XML sequence.
Shift + Ctrl/Cmd + E	n/a	File > Export	Export the selected sequence.
V	n/a	n/a	Display the available versions of a clip or sequence.
Alt + close Spreadsheet		n/a	Close the spreadsheet and any linked timeline and Viewer panes.
Alt + Shift <num>	n/a	File > Open Recent > Project Name	Open a previously saved project from the list.
<b>Bin View Searchbox</b>			
left-click	n/a	n/a	Select a tag search criteria.
Ctrl/Cmd + left-click	n/a	n/a	Toggle select individual tag search criteria.
Shift + left-click	n/a	n/a	Select a range of tag search criteria.
<b>Script Editor</b>			
Ctrl/Cmd + [		n/a	Go to the previous script.
Ctrl/Cmd + ]		n/a	Go to the next script.
Ctrl/Cmd + Enter		n/a	Execute current script.
Ctrl/Cmd + Backspace		n/a	Clear the output pane.

## APPENDIX B

### Supported Image Formats

The following table lists supported image formats.

Format Name	Bit Depths	Read/Write	Extension
ARRIRAW	12	read only	ari
AVI	n/a	read only	avi
CIN	10 (log)	read and write	cin
DPX (see the notes below)	8, 10, 12, and 16	read and write	dpx
Radiance	16	read only	hdr, hdri
JPEG	8	read and write	jpg, jpeg
Maya IFF	8 and 16	read only	iff
OpenEXR (see the notes below)	16 and 32	read and write	exr
PNG	8 and 16	read and write	png (8-bit) png16 (16-bit)
PSD	8	read only	psd
QuickTime	n/a	read and write	mov
RAW	n/a	read only	n/a
REDCODE (see the notes below)	16	read only	r3d
SGI	8 and 16	read and write	sgi, rgb, rgba (8-bit sequences) sgi16 (for 16-bit sequences)
SoftImage® PIC	8	read and write	pic
TIFF	8, 16, and 32	read and write	tif, tiff (8-bit sequences) tif16, tiff16 (16-bit sequences) ftif, ftiff (32-bit sequences)
Truevision® TARGA	8	read and write	tga, targa
Wavefront® RLA	8	read only	rla
XPM	8	read only	xpm
YUV	8	read only	yuv

## Optimised Formats and Limitations

Hiero and HieroPlayer play most formats as fast as they can be read from the file system. The frames are cached in RAM up to the cache limit specified in the **Preferences** dialog. When the cache is full, frames are ejected and must be re-read from disk if needed again.

The playback system supports automatic resolution switching, which enables realtime playback of source clips on typical desktop and graphics card combinations.

Most file formats are read through the same image I/O library used by The Foundry's Nuke. Formats are optimised for realtime playback based on user feedback about what is most frequently used. The following formats have been optimised, so that the only limiting factor in achieving realtime playback is the rate at which files can be read from the file system:

### R3D

In conjunction with a RED Rocket, Hiero and HieroPlayer can take advantage of the lower scale/quality available from the RED SDK based on the current Viewer zoom level.

### EXR

EXR reads have been partially optimised. They currently still load more slowly if any part of the data window lies outside the display window, or if the data window is smaller than the display window and aligned to one of the edges of the display window. This reduction in speed is most noticeable for large data windows.



**NOTE:** OpenEXR 2.0 images containing Deep data are not supported in this release.

### DPX

8-, 10-, 12-, and 16-bit RGB and RGBA reads are optimised, if the channels are all stored in the same element. Reads of other formats may be optimised depending on the number, bit depth and layout (within elements) of the channels. Future releases will handle more formats.

## Supported Audio Formats

The following table lists supported audio formats.



**NOTE:** Although Hiero and HieroPlayer support the import and editing of multi-channel audio, during playback audio is currently mixed to 48 KHz stereo output.

Additionally, audio mixdown takes into account the total number of tracks present and averages the contribution of each to prevent clipping.

Format Name	Extension
<b>All platforms</b>	
RED Audio	n/a
Wave	wav
Audio interchange format	aiff
<b>Mac and Windows</b>	
QuickTime Audio	.m4a

## APPENDIX C

### Third Party Licences

This appendix lists third party libraries used in Hiero and HieroPlayer, along with their licences.

Library	Description	Licence
Boost/1.46.0	Source code function / template library	<p>Boost Software License - Version 1.0 - August 17th, 2003</p> <p>Permission is hereby granted, free of charge, to any person or organisation obtaining a copy of the software and accompanying documentation covered by this license (the "Software") to use, reproduce, display, distribute, execute, and transmit the Software, and to prepare derivative works of the Software, and to permit third-parties to whom the Software is furnished to do so, all subject to the following:</p> <p>The copyright notices in the Software and this entire statement, including the above license grant, this restriction and the following disclaimer, must be included in all copies of the Software, in whole or in part, and all derivative works of the Software, unless such copies or derivative works are solely in the form of machine-executable object code generated by a source language processor.</p> <p>THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NON-INFRINGEMENT. IN NO EVENT SHALL THE COPYRIGHT HOLDERS OR ANYONE DISTRIBUTING THE SOFTWARE BE LIABLE FOR ANY DAMAGES OR OTHER LIABILITY, WHETHER IN CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.</p>

Library	Description	Licence
Breakpad/1.0	Multi-platform crash reporting system	<p>Copyright © 2010, Google Inc. All rights reserved.</p> <p>Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.</li> <li>• Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.</li> <li>• Neither the name of the organization nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.</li> </ul> <p>THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.</p>
bzip2	Data compressor	<p>Copyright © 1996–2000 Julian R Seward. All rights reserved.</p> <p>Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:</p> <ol style="list-style-type: none"> <li>1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.</li> <li>2. The origin of this software must not be misrepresented; you must not claim that you wrote the original software. If you use this software in a product, an acknowledgment in the product documentation would be appreciated but is not required.</li> <li>3. Altered source versions must be plainly marked as such, and must not be misrepresented as being the original software.</li> <li>4. The name of the author may not be used to endorse or promote products derived from this software without specific prior written permission.</li> </ol> <p>THIS SOFTWARE IS PROVIDED BY THE AUTHOR "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.</p>

Library	Description	Licence
Curl/7.21.1	URL transfer library	<p>Copyright © 1996 - 2010, Daniel Stenberg, &lt;daniel@haxx.se&gt;.</p> <p>All rights reserved.</p> <p>Permission to use, copy, modify, and distribute this software for any purpose with or without fee is hereby granted, provided that the above copyright notice and this permission notice appear in all copies.</p> <p>THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OF THIRD PARTY RIGHTS. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.</p> <p>Except as contained in this notice, the name of a copyright holder shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization of the copyright holder.</p>
EuCon/2.5.5	Software development kit	<p>The EUCON specification and trademark are property of Avid Technology, Inc. Used under license.</p>
Expat/2.0.1	XML parser	<p>Copyright © 1998, 1999, 2000 Thai Open Source Software Center Ltd and Clark Cooper</p> <p>Copyright © 2001, 2002, 2003, 2004, 2005, 2006 Expat maintainers.</p> <p>Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:</p> <p>The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.</p> <p>THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.</p>
FBX/2010.2	File format support	<p>This software contains Autodesk® FBX® code developed by Autodesk, Inc. Copyright 2008 Autodesk, Inc. All rights, reserved. Such code is provided "as is" and Autodesk, Inc. disclaims any and all warranties, whether express or implied, including without limitation the implied warranties of merchantability, fitness for a particular purpose or non-infringement of third party rights. In no event shall Autodesk, Inc. be liable for any direct, indirect, incidental, special, exemplary, or consequential damages (including, but not limited to, procurement of substitute goods or services; loss of use, data, or profits; or business interruption) however caused and on any theory of liability, whether in contract, strict liability, or tort (including negligence or otherwise) arising in any way out of such code.</p>

Library	Description	Licence
FFmpeg/r15261	File format support	<p>Copyright © 2001 Fabrice Bellard</p> <p>This file is part of FFmpeg.</p> <p>FFmpeg is free software; you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2.1 of the License, or (at your option) any later version.</p> <p>FFmpeg is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details.</p> <p>You should have received a copy of the GNU Lesser General Public License along with FFmpeg; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA</p>
GLEW/1.5.8	OpenGL support	<p>The OpenGL Extension Wrangler Library Copyright © 2002-2008, Milan Ikits &lt;milanikits@ieee.org&gt;</p> <p>Copyright © 2002-2008, Marcelo E. Magallon &lt;mmagallo@debian.org&gt;</p> <p>Copyright © 2002, Lev Povalahev All rights reserved.</p> <p>Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.</li> <li>• Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.</li> <li>• The name of the author may be used to endorse or promote products derived from this software without specific prior written permission.</li> </ul> <p>THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.</p>

Library	Description	Licence
Google BSD	Testing Framework	<p>Copyright © 2009, Google Inc. All rights reserved.</p> <p>Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.</li> <li>• Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.</li> <li>• Neither the name of Google Inc. nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.</li> </ul> <p>THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.</p>
JPEG/6b	File format support	This software is based in part on the work of the Independent JPEG Group.
Libexif/0.6.20	Metadata parser	<p>Author Lutz Mueller lutz@users.sourceforge.net date 2001-2005</p> <p>This library is free software; you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.</p> <p>This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details.</p>

Library	Description	Licence
Libpng/1.2.25	File format support	<p>This copy of the libpng notices is provided for your convenience. In case of any discrepancy between this copy and the notices in the file png.h that is included in the libpng distribution, the latter shall prevail.</p> <p><b>COPYRIGHT NOTICE, DISCLAIMER, and LICENSE:</b></p> <p>If you modify libpng you may insert additional notices immediately following this sentence.</p> <p>libpng versions 1.2.6, August 15, 2004, through 1.2.25, February 18, 2008, are Copyright © 2004, 2006-2008 Glenn Randers-Pehrson, and are distributed according to the same disclaimer and license as libpng-1.2.5 with the following individual added to the list of Contributing Authors: Cosmin Truta.</p> <p>libpng versions 1.0.7, July 1, 2000, through 1.2.5 - October 3, 2002, are Copyright © 2000-2002 Glenn Randers-Pehrson, and are distributed according to the same disclaimer and license as libpng-1.0.6 with the following individuals added to the list of Contributing Authors: Simon-Pierre Cadieux, Eric S. Raymond, Gilles Vollant.</p> <p>Including the following additions to the disclaimer:</p> <p>There is no warranty against interference with your enjoyment of the library or against infringement. There is no warranty that our efforts or the library will fulfill any of your particular purposes or needs. This library is provided with all faults, and the entire risk of satisfactory quality, performance, accuracy, and effort is with the user.</p> <p>libpng versions 0.97, January 1998, through 1.0.6, March 20, 2000, are Copyright © 1998, 1999 Glenn Randers-Pehrson, and are distributed according to the same disclaimer and license as libpng-0.96, with the following individuals added to the list of Contributing Authors: Tom Lane, Glenn Randers-Pehrson, Willem van Schaik.</p> <p>libpng versions 0.89, June 1996, through 0.96, May 1997, are Copyright © 1996, 1997 Andreas Dilger Distributed according to the same disclaimer and license as libpng-0.88, with the following individuals added to the list of Contributing Authors: John Bowler, Kevin Bracey, Sam Bushell, Magnus Holmgren, Greg Roelofs, Tom Tanner</p> <p>libpng versions 0.5, May 1995, through 0.88, January 1996, are Copyright © 1995, 1996 Guy Eric Schalnat, Group 42, Inc. For the purposes of this copyright and license, "Contributing Authors" is defined as the following set of individuals: Andreas Dilger, Dave Martindale, Guy Eric Schalnat, Paul Schmidt, Tim Wegner</p> <p>The PNG Reference Library is supplied "AS IS". The Contributing Authors and Group 42, Inc. disclaim all warranties, expressed or implied, including, without limitation, the warranties of merchantability and of fitness for any purpose. The Contributing Authors and Group 42, Inc. assume no liability for direct, indirect, incidental, special, exemplary, or consequential damages, which may result from the use of the PNG Reference Library, even if advised of the possibility of such damage.</p>

Library	Description	Licence
		<p>Permission is hereby granted to use, copy, modify, and distribute this source code, or portions hereof, for any purpose, without fee, subject to the following restrictions:</p> <ol style="list-style-type: none"> <li>1. The origin of this source code must not be misrepresented.</li> <li>2. Altered versions must be plainly marked as such and must not be misrepresented as being the original source.</li> <li>3. This Copyright notice may not be removed or altered from any source or altered source distribution.</li> </ol> <p>The Contributing Authors and Group 42, Inc. specifically permit, without fee, and encourage the use of this source code as a component to supporting the PNG file format in commercial products. If you use this source code in a product, acknowledgment is not required but would be appreciated.</p> <p>A "png_get_copyright" function is available, for convenient use in "about" boxes and the like:</p> <pre>printf("%s",png_get_copyright(NULL));</pre> <p>Also, the PNG logo (in PNG format, of course) is supplied in the files "pngbar.png" and "pngbar.jpg (88x31) and "pngnow.png" (98x31).</p> <p>Libpng is OSI Certified Open Source Software. OSI Certified Open Source is a certification mark of the Open Source Initiative.</p> <p>Glenn Randers-Pehrson glennrp at users.sourceforge.net February 18, 2008</p>
libresample/0.1.3	Realtime resampler	<p>All of the files in this package are Copyright 2003 by Dominic Mazzoni &lt;dominic@minorninth.com&gt;. This library was based heavily on Resample-1.7, Copyright 1994-2002 by Julius O. Smith III &lt;jos@ccrma.stanford.edu&gt;, all rights reserved.</p> <p>Permission to use and copy is granted subject to the terms of the "GNU Lesser General Public License" (LGPL) as published by the Free Software Foundation; either version 2.1 of the License, or any later version. In addition, Julius O. Smith III requests that a copy of any modified files be sent by email to jos@ccrma.stanford.edu so that he may incorporate them into the CCRMA version.</p> <p>This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details.</p>

Library	Description	Licence
libsndfile/1.0.25	Audio read/write	<p>Copyright © 1999-2011 Erik de Castro Lopo &lt;erikd@mega-nerd.com&gt; Copyright © 2005 David Viens &lt;davidv@plogue.com&gt;</p> <p>This program is free software; you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2.1 of the License, or (at your option) any later version.</p> <p>This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details.</p> <p>You should have received a copy of the GNU Lesser General Public License along with this program; if not, write to the Free Software Foundation, Inc., 59 Temple Place - Suite 330, Boston, MA 02111-1307, USA.</p>
Libtiff/3.9.4	File format support	<p>Copyright © 1988-1997 Sam Leffler Copyright © 1991-1997 Silicon Graphics, Inc.</p> <p>Permission to use, copy, modify, distribute, and sell this software and its documentation for any purpose is hereby granted without fee, provided that (i) the above copyright notices and this permission notice appear in all copies of the software and related documentation, and (ii) the names of Sam Leffler and Silicon Graphics may not be used in any advertising or publicity relating to the software without the specific, prior written permission of Sam Leffler and Silicon Graphics.</p> <p>THE SOFTWARE IS PROVIDED "AS-IS" AND WITHOUT WARRANTY OF ANY KIND, EXPRESS, IMPLIED OR OTHERWISE, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.</p> <p>IN NO EVENT SHALL SAM LEFFLER OR SILICON GRAPHICS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES OF ANY KIND, OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER OR NOT ADVISED OF THE POSSIBILITY OF DAMAGE, AND ON ANY THEORY OF LIABILITY, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.</p>

Library	Description	Licence
Msinttypes/r20	File format support	<p>Copyright © 2006 Alexander Chemeris</p> <p>Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.</li> <li>• Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.</li> <li>• The name of the author may not be used to endorse or promote products derived from this software without specific prior written permission.</li> </ul> <p>THIS SOFTWARE IS PROVIDED BY THE AUTHOR "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.</p>
OpenALSoft/1.13	Cross platform audio library	<p>Copyright © 1999-2007 by authors.</p> <p>This library is free software; you can redistribute it and/or modify it under the terms of the GNU Library General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.</p> <p>This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Library General Public License for more details.</p> <p>You should have received a copy of the GNU Library General Public License along with this library; if not, write to the Free Software Foundation, Inc., 59 Temple Place - Suite 330, Boston, MA 02111-1307, USA.</p> <p>Or go to <a href="http://www.gnu.org/copyleft/lgpl.html">www.gnu.org/copyleft/lgpl.html</a></p>

Library	Description	Licence
OpenColorIO/ 1.0.0	Color management library	<p>Copyright © 2003–2010 Sony Pictures Imageworks Inc., et al. All Rights Reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.</li> <li>• Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.</li> <li>• Neither the name of Sony Pictures Imageworks nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.</li> </ul> <p>THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.</p>
OpenEXR/cvs-03-03-2008	File format support	<p>Copyright © 2002, Industrial Light &amp; Magic, a division of Lucas Digital Ltd. LLC All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.</li> <li>• Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.</li> <li>• Neither the name of Industrial Light &amp; Magic nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.</li> </ul> <p>THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.</p>

Library	Description	Licence
OpenImageIO/ r1719	File format support	<p>Copyright © 2008 Larry Gritz and the other authors and contributors. All Rights Reserved.</p> <p>Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.</li> <li>• Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.</li> <li>• Neither the name of the software's owners nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.</li> </ul> <p>THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.</p>

Library	Description	Licence
OpenSSL/1.0.0a	A toolkit implementing the Secure Sockets Layer (SSL v2/v3) and Transport Layer Security (TLS v1) protocols as well as a full-strength general purpose cryptography library	<p>The OpenSSL toolkit stays under a dual license, i.e. both the conditions of the OpenSSL License and the original SSLeay license apply to the toolkit. See below for the actual license texts. Actually both licenses are BSD-style Open Source licenses. In case of any license issues related to OpenSSL please contact: openssl-core@openssl.org.</p> <p>OpenSSL License</p> <p>Copyright © 1998–2008 The OpenSSL Project. All rights reserved.</p> <p>Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:</p> <ol style="list-style-type: none"> <li>1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.</li> <li>2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials also provided with the distribution.</li> <li>3. All advertising materials mentioning features or use of this software must display the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (<a href="http://www.openssl.org/">http://www.openssl.org/</a>)"</li> <li>4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact openssl-core@openssl.org.</li> <li>5. Products derived from this software may not be called "OpenSSL" nor may "OpenSSL" appear in their names without prior written permission of the OpenSSL Project.</li> <li>6. Redistributions of any form whatsoever must retain the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<a href="http://www.openssl.org/">http://www.openssl.org/</a>)"</li> </ol> <p>THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.</p> <p>This product includes cryptographic software written by Eric Young (eay@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com).</p>

Library	Description	Licence
		<p>Original SSLeay License</p> <p>Copyright © 1995-1998 Eric Young (eay@cryptsoft.com)</p> <p>All rights reserved.</p> <p>This package is an SSL implementation written by Eric Young (eay@cryptsoft.com). The implementation was written so as to conform with Netscapes SSL.</p> <p>This library is free for commercial and non-commercial use as long as the following conditions are aheared to. The following conditions apply to all code found in this distribution, be it the RC4, RSA, lhash, DES, etc., code; not just the SSL code. The SSL documentation included with this distribution is covered by the same copyright terms except that the holder is Tim Hudson (tjh@cryptsoft.com).</p> <p>Copyright remains Eric Young's, and as such any Copyright notices in the code are not to be removed.</p> <p>If this package is used in a product, Eric Young should be given attribution as the author of the parts of the library used.</p> <p>This can be in the form of a textual message at program startup or in documentation (online or textual) provided with the package.</p> <p>Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:</p> <ol style="list-style-type: none"> <li>1. Redistributions of source code must retain the copyright notice, this list of conditions and the following disclaimer.</li> <li>2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.</li> <li>3. All advertising materials mentioning features or use of this software must display the following acknowledgement: "This product includes cryptographic software written by Eric Young (eay@cryptsoft.com)" The word 'cryptographic' can be left out if the routines from the library being used are not cryptographic related.</li> <li>4. If you include any Windows specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgement: "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"</li> </ol> <p>THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.</p>

Library	Description	Licence
		<p>The licence and distribution terms for any publically available version or derivative of this code cannot be changed. i.e. this code cannot simply be copied and put under another distribution licence [including the GNU Public Licence.]</p>
PortAudio	Portable Real-Time Audio Library	<p>Copyright © 1999-2011 Ross Bencina and Phil Burk.</p> <p>Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:</p> <ul style="list-style-type: none"> <li>• The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.</li> </ul> <p>THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT.</p> <p>IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.</p> <p>The text above constitutes the entire PortAudio license; however, the PortAudio community also makes the following non-binding requests:</p> <ul style="list-style-type: none"> <li>• Any person wishing to distribute modifications to the Software is requested to send the modifications to the original developer so that they can be incorporated into the canonical version. It is also requested that these non-binding requests be included along with the license above.</li> </ul>
PySide 1.0.9	Python bindings for the Qt cross-platform application and UI framework	<p>Copyright © 2009-2010 Nokia Corporation and/or its subsidiary(-ies).</p> <p>Contact: PySide team &lt;contact@pyside.org&gt;</p> <p>This library is free software; you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2.1 of the License, or (at your option) any later version.</p> <p>This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details.</p> <p>You should have received a copy of the GNU Lesser General Public License along with this library; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA</p>

Library	Description	Licence
PyString	C++ functions matching the interface and behavior of Python's string class methods	<p>Copyright © 2008–2010, Sony Pictures Imageworks Inc All rights reserved.</p> <p>Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.</li> <li>• Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.</li> <li>• Neither the name of the organization Sony Pictures Imageworks nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.</li> </ul> <p>THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.</p>
Python/2.6.5	Source code language	Copyright © 2001, 2002, 2003, 2004 Python Software Foundation; All Rights Reserved.
Qt/4.7.2	Application and UI framework	<p>The Qt GUI Toolkit is Copyright © 2010 Nokia Corporation and/or its subsidiary(-ies).</p> <p>Contact: Nokia Corporation (qt-info@nokia.com)</p> <p>Qt is available under the GNU Lesser General Public License.</p> <p>To see the GNU Lesser General Public License, go to <a href="http://www.gnu.org/licenses/">www.gnu.org/licenses/</a>.</p>
QuaZip/0.3	Qt ZIP wrapper	<p>Copyright © 2005 Sergey A. Tachenov</p> <p>This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.</p> <p>This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.</p> <p>Original ZIP package is copyrighted by Gilles Vollant, see quazip/(un)zip.h files for details.</p>
QuickTime/7.3	QuickTime player	Copyright © 1990–2006 by Apple Inc., all rights reserved.
R3D/4.3	Software Development Kit	<p>The R3D SDK and all included materials (including header files, libraries, sample code &amp; documentation) are Copyright © 2008–2011 RED Digital Cinema. All rights reserved. All trademarks are the property of their respective owners.</p> <p>This software was developed using KAKADU software.</p>

Library	Description	Licence
Skein/1.1	Hashing library	<p>Source code author: Doug Whiting, 2008.</p> <p>This algorithm and source code is released to the public domain.</p> <p>Copyright © 2003, Dr Brian Gladman, Worcester, UK. All rights reserved.</p> <p><b>LICENSE TERMS</b></p> <p>The free distribution and use of this software in both source and binary form is allowed (with or without changes) provided that:</p> <ol style="list-style-type: none"> <li>1. distributions of this source code include the above copyright notice, this list of conditions and the following disclaimer;</li> <li>2. distributions in binary form include the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other associated materials;</li> <li>3. the copyright holder's name is not used to endorse products built using this software without specific written permission.</li> </ol> <p>ALTERNATIVELY, provided that this notice is retained in full, this product may be distributed under the terms of the GNU General Public License (GPL), in which case the provisions of the GPL apply INSTEAD OF those given above.</p> <p><b>DISCLAIMER</b></p> <p>This software is provided 'as is' with no explicit or implied warranties in respect of its properties, including, but not limited to, correctness and/or fitness for purpose.</p>
TTB	Thread Building Blocks	<p>Copyright 2005-2010 Intel Corporation. All Rights Reserved.</p> <p>This file is part of Threading Building Blocks.</p> <p>Threading Building Blocks is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License version 2 as published by the Free Software Foundation.</p> <p>Threading Building Blocks is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.</p> <p>You should have received a copy of the GNU General Public License along with Threading Building Blocks; if not, write to the Free Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA.</p> <p>As a special exception, you may use this file as part of a free software library without restriction. Specifically, if other files instantiate templates or use macros or inline functions from this file, or you compile this file and link it with other files to produce an executable, this file does not by itself cause the resulting executable to be covered by the GNU General Public License. This exception does not however invalidate any other reasons why the executable file might be covered by the GNU General Public License.</p>

Library	Description	Licence
VXL/1.10.0	Computer vision	<p>Copyright © 2000–2003 TargetJr Consortium            GE Corporate Research and Development (GE CRD)            1 Research Circle            Niskayuna, NY 12309            All Rights Reserved            Reproduction rights limited as described below.</p> <p>Permission to use, copy, modify, distribute, and sell this software and its documentation for any purpose is hereby granted without fee, provided that (i) the above copyright notice and this permission notice appear in all copies of the software and related documentation, (ii) the name TargetJr Consortium (represented by GE CRD), may not be used in any advertising or publicity relating to the software without the specific, prior written permission of GE CRD, and (iii) any modifications are clearly marked and summarised in a change history log.</p> <p>THE SOFTWARE IS PROVIDED “AS IS” AND WITHOUT WARRANTY OF ANY KIND, EXPRESS, IMPLIED OR OTHERWISE, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL THE TARGETJR CONSORTIUM BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES OF ANY KIND OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER OR NOT ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, OR ON ANY THEORY OF LIABILITY ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.</p>
xmlrpcpp/0.7	C++ implementation of the XML-RPC protocol	<p>A full copy of the LGPL license is included in the file COPYING. The source code is Copyright © 2002–2003 by Chris Morley.</p> <p>This library is free software; you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2.1 of the License, or (at your option) any later version. This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details. You should have received a copy of the GNU Lesser General Public License along with this library; if not, write to the Free Software Foundation, Inc., 59 Temple Place, Suite 330, Boston, MA 02111-1307 USA.</p>

---

Library	Description	Licence
Zlib/1.2.5	Compression library	<p>Copyright © 1995–2010 Jean-loup Gailly and Mark Adler</p> <p>This software is provided 'as-is', without any express or implied warranty. In no event will the authors be held liable for any damages arising from the use of this software.</p> <p>Permission is granted to anyone to use this software for any purpose, including commercial applications, and to alter it and redistribute it freely, subject to the following restrictions:</p> <ol style="list-style-type: none"><li>1. The origin of this software must not be misrepresented; you must not claim that you wrote the original software. If you use this software in a product, an acknowledgment in the product documentation would be appreciated but is not required.</li><li>2. Altered source versions must be plainly marked as such, and must not be misrepresented as being the original software.</li><li>3. This notice may not be removed or altered from any source distribution.</li></ol>

## APPENDIX D

### End User License Agreement (EULA)

IMPORTANT: BY INSTALLING THIS SOFTWARE YOU ACKNOWLEDGE THAT YOU HAVE READ THIS AGREEMENT, UNDERSTAND IT AND AGREE TO BE BOUND BY ITS TERMS AND CONDITIONS. IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT DO NOT INSTALL, COPY OR USE THE SOFTWARE.

This END USER LICENSE AGREEMENT (this "Agreement") is made by and between The Foundry Visionmongers Ltd., a company registered in England and Wales, ("The Foundry"), and you, as either an individual or a single entity ("Licensee").

In consideration of the mutual covenants contained herein and for other good and valuable consideration (the receipt and sufficiency of which is acknowledged by each party hereto) the parties agree as follows:

#### SECTION 1. GRANT OF LICENSE.

Subject to the limitations of Section 2, The Foundry hereby grants to Licensee a limited, non-transferable and non-exclusive license to install and use a machine readable, object code version of this software program (the "Software") and accompanying user guide and other documentation (collectively, the "Documentation") solely for Licensee's own internal business purposes (collectively, the "License"); provided, however, Licensee's right to install and use the Software and the Documentation is limited to those rights expressly set out in this Agreement.

#### SECTION 2. RESTRICTIONS ON USE.

Licensee is authorized to use the Software in machine readable, object code form only, and Licensee shall not: (a) assign, sublicense, sell, distribute, transfer, pledge, lease, rent, share or export the Software, the Documentation or Licensee's rights hereunder; (b) alter or circumvent the copy protection mechanisms in the Software or reverse engineer, decompile, disassemble or otherwise attempt to discover the source code of the Software; (c) modify, adapt, translate or create derivative works based on the Software or Documentation; (d) use, or allow the use of, the Software or Documentation on any project other than a project produced by Licensee (an "Authorized Project"); (e) allow or permit anyone (other than Licensee and Licensee's authorized employees to the extent they are working on an Authorized Project) to use or have access to the Software or Documentation; (f) copy or install the Software or Documentation other than as expressly provided for herein; or (g) take any action, or fail to take action, that could adversely affect the trademarks, service marks, patents, trade secrets, copyrights or other intellectual property rights of The Foundry or any third party with intellectual property rights in the Software (each, a "Third Party Licensor"). Furthermore, for purposes of this Section 2, the term "Software" shall include any derivatives of the Software.

Licensee shall install and use only a single copy of the Software on one computer, unless the Software is

installed in a "floating license" environment, in which case Licensee may install the Software on more than one computer; provided, however, Licensee shall not at any one time use more copies of the Software than the total number of valid Software licenses purchased by Licensee.

Please note that in order to guard against unlicensed use of the Software a licence key is required to access and enable the Software. The issuing of replacement or substituted licence keys if the Software is moved from one computer to another is subject to and strictly in accordance with The Foundry's Licence Transfer Policy, which is available on The Foundry's website and which requires a fee to be paid in certain circumstances. The Foundry may from time to time and at its sole discretion vary the terms and conditions of the Licence Transfer Policy.

Furthermore, if the Software can be licensed on an "interactive" or "non-interactive" basis, licensee shall be authorized to use a non-interactive version of the Software for rendering purposes only (i.e., on a CPU, without a user, in a non-interactive capacity) and shall not use such Software on workstations or otherwise in a user-interactive capacity. Licensee shall be authorized to use an interactive version of the Software for both interactive and non-interactive rendering purposes, if available.

If Licensee has purchased the Software on the discount terms offered by The Foundry's Educational Policy published on its website ("the Educational Policy"), Licensee warrants and represents to The Foundry as a condition of this Agreement that: (a) (if Licensee is an individual) he or she is a part-time or full-time student at the time of purchase and will not use the Software for commercial, professional or for-profit purposes; (b) (if the Licensee is not an individual) it is an organisation that will use it only for the purpose of training and instruction, and for no other purpose (c) Licensee will at all times comply with the Educational Policy (as such policy may be amended from time to time).

Finally, if the Software is a "Personal Learning Edition," ("PLE") Licensee may use it only for the purpose of personal or internal training and instruction, and for no other purpose. PLE versions of the Software may not be used for commercial, professional or for-profit purposes including, for the avoidance of doubt, the purpose of providing training or instruction to third parties.

### **SECTION 3. SOURCE CODE.**

Notwithstanding that Section 1 defines "Software" as an object code version and that Section 2 provides that Licensee may use the Software in object code form only:

(1) The Foundry may also agree to license to Licensee (including by way of upgrades, updates or enhancements) source code or elements of the source code of the Software the intellectual property rights in which belong either to The Foundry or to a Third Party Licensor ("Source Code"). If The Foundry does so Licensee shall be licensed to use the Source Code as Software on the terms of this Agreement and: (a) notwithstanding Section 2 (c) Licensee may use the Source Code at its own risk in any reasonable way for the limited purpose of enhancing its use of the Software solely for its own internal business purposes and in all respects in accordance with this Agreement; (b) Licensee shall in respect of the Source Code comply strictly with all other restrictions applying to its use of the Software under this Agreement as well as any other restriction or instruction that is communicated to it by The Foundry at any time during this Agreement (whether imposed or requested by The Foundry or by any Third Party Licensor); and

(2) To the extent that the Software links to any open source software libraries ("OSS Libraries") that are provided to Licensee with the Software, nothing in this Agreement shall affect Licensee's rights under the licenses on which the relevant Third Party Licensor has licensed the OSS Libraries, as stated in the Software documentation. To the extent that Third Party Licensors have licensed OSS Libraries on the terms of v2.1 of the Lesser General Public License issued by the Free Software Foundation (see <http://www.gnu.org/licenses/lgpl-2.1.html>) (the "LGPL"), those OSS Libraries are licensed to Licensee on the terms of the LGPL and are referred to in this Section 3(2) as the LGPL Libraries. The Foundry will at any time during the three year period starting on the date of this Agreement, at the request of Licensee and subject to Licensee paying to The Foundry a charge that does not exceed The Foundry's costs of doing so, provide Licensee with the source code of the LGPL Libraries ("the LGPL Source") in order that Licensee may modify the LGPL Libraries in accordance with the LGPL, together with certain object code of the Software necessary to enable Licensee to re-link any modified LGPL Library to the Software ("the Object").

Notwithstanding any other term of this Agreement The Foundry shall have no obligation to provide support, maintenance, upgrades or updates of or in respect of any of the Source Code, the OSS Libraries (including the LGPL Libraries), the LGPL Source, the Object or any Modification. Licensee shall indemnify The Foundry against all liabilities and expenses (including reasonable legal costs) incurred by The Foundry in relation to any claim asserting that any Modification infringes the intellectual property rights of any third party.

#### **SECTION 4. BACK-UP COPY.**

Notwithstanding Section 2, Licensee may store one copy of the Software and Documentation off-line and off-site in a secured location owned or leased by Licensee in order to provide a back-up in the event of destruction by fire, flood, acts of war, acts of nature, vandalism or other incident. In no event may Licensee use the back-up copy of the Software or Documentation to circumvent the usage or other limitations set forth in this Agreement.

#### **SECTION 5. OWNERSHIP.**

Licensee acknowledges that the Software (including, for the avoidance of doubt, any Source Code that is licensed to Licensee) and Documentation and all intellectual property rights and other proprietary rights relating thereto are and shall remain the sole property of The Foundry and the Third Party Licensors. Licensee shall not remove, or allow the removal of, any copyright or other proprietary rights notice included in and on the Software or Documentation or take any other action that could adversely affect the property rights of The Foundry or any Third Party Licensor. To the extent that Licensee is authorized to make copies of the Software or Documentation under this Agreement, Licensee shall reproduce in and on all such copies any copyright and/or other proprietary rights notices provided in and on the materials supplied by The Foundry hereunder. Nothing in this Agreement shall be deemed to give Licensee any rights in the trademarks, service marks, patents, trade secrets, confidential information, copyrights or other intellectual property rights of The Foundry or any Third Party Licensor, and Licensee shall be strictly prohibited from using the name, trademarks or service marks of The Foundry or any Third Party Licensor in Licensee's promotion or publicity without The Foundry's express written approval.

---

**SECTION 6. LICENSE FEE.**

Licensee understands that the benefits granted to Licensee hereunder are contingent upon Licensee's payment in full of the license fee payable in connection herewith (the "License Fee").

**SECTION 7. UPGRADES/ENHANCEMENTS.**

The Licensee's access to support, upgrades and updates is subject to the terms and conditions of the "Annual Upgrade and Support Programme" available on The Foundry's website. The Foundry may from time to time and at its sole discretion vary the terms and conditions of the Annual Upgrade and Support Programme.

**SECTION 8. TAXES AND DUTIES.**

Licensee agrees to pay, and indemnify The Foundry from claims for, any local, state or national tax (exclusive of taxes based on net income), duty, tariff or other impost related to or arising from the transaction contemplated by this Agreement.

**SECTION 9. LIMITED WARRANTY.**

The Foundry warrants that, for a period of ninety (90) days after delivery of the Software: (a) the machine readable electronic files constituting the Software and Documentation shall be free from errors that may arise from the electronic file transfer from The Foundry and/or its authorized reseller to Licensee; and (b) to the best of The Foundry's knowledge, Licensee's use of the Software in accordance with the Documentation will not, in and of itself, infringe any third party's copyright, patent or other intellectual property rights. Except as warranted, the Software and Documentation is being provided "as is." THE FOREGOING LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, AND The Foundry DISCLAIMS ANY AND ALL IMPLIED WARRANTIES OR CONDITIONS, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF TITLE, NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, REGARDLESS OF WHETHER The Foundry KNOWS OR HAS REASON TO KNOW OF LICENSEE'S PARTICULAR NEEDS. The Foundry does not warrant that the Software or Documentation will meet Licensee's requirements or that Licensee's use of the Software will be uninterrupted or error free. No employee or agent of The Foundry is authorized to modify this limited warranty, nor to make additional warranties. No action for any breach of the above limited warranty may be commenced more than one (1) year after Licensee's initial receipt of the Software. To the extent any implied warranties may not be disclaimed under applicable law, then ANY IMPLIED WARRANTIES ARE LIMITED IN DURATION TO NINETY (90) DAYS AFTER DELIVERY OF THE SOFTWARE TO LICENSEE.

**SECTION 10. LIMITED REMEDY.**

The exclusive remedy available to the Licensee in the event of a breach of the foregoing limited warranty, TO THE EXCLUSION OF ALL OTHER REMEDIES, is for Licensee to destroy all copies of the Software, send The Foundry a written certification of such destruction and, upon The Foundry's receipt of such certification, The Foundry will make a replacement copy of the Software available to Licensee.

---

**SECTION 11. INDEMNIFICATION.**

Licensee agrees to indemnify, hold harmless and defend The Foundry, the Third Party Licensors and The Foundry's and each Third Party Licensor's respective affiliates, officers, directors, shareholders, employees, authorized resellers, agents and other representatives (collectively, the "Released Parties") from all claims, defense costs (including, but not limited to, attorneys' fees), judgments, settlements and other expenses arising from or connected with the operation of Licensee's business or Licensee's possession or use of the Software or Documentation.

**SECTION 12. LIMITED LIABILITY.**

In no event shall the Released Parties' cumulative liability to Licensee or any other party for any loss or damages resulting from any claims, demands or actions arising out of or relating to this Agreement (or the Software or Documentation contemplated herein) exceed the License Fee paid to The Foundry or its authorized reseller for use of the Software. Furthermore, IN NO EVENT SHALL THE RELEASED PARTIES BE LIABLE TO LICENSEE UNDER ANY THEORY FOR ANY INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, EXEMPLARY OR CONSEQUENTIAL DAMAGES (INCLUDING DAMAGES FOR LOSS OF BUSINESS OR LOSS OF PROFITS) OR THE COST OF PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES, REGARDLESS OF WHETHER THE RELEASED PARTIES KNOW OR HAVE REASON TO KNOW OF THE POSSIBILITY OF SUCH DAMAGES AND REGARDLESS OF WHETHER ANY REMEDY SET FORTH HEREIN FAILS OF ITS ESSENTIAL PURPOSE. No action arising out of or related to this Agreement, regardless of form, may be brought by Licensee more than one (1) year after Licensee's initial receipt of the Software; provided, however, to the extent such one (1) year limit may not be valid under applicable law, then such period shall be limited to the shortest period allowed by law.

**SECTION 13. TERM; TERMINATION.**

This Agreement is effective upon Licensee's acceptance of the terms hereof and Licensee's payment of the License Fee, and the Agreement will remain in effect until termination. If Licensee breaches this Agreement, The Foundry may terminate the License granted hereunder by notice to Licensee. In the event the License is terminated, Licensee will either return to The Foundry all copies of the Software and Documentation in Licensee's possession or, if The Foundry directs in writing, destroy all such copies. In the later case, if requested by The Foundry, Licensee shall provide The Foundry with a certificate signed by an officer of Licensee confirming that the foregoing destruction has been completed.

**SECTION 14. CONFIDENTIALITY.**

Licensee agrees that the Software (including, for the avoidance of doubt, any Source Code that is licensed to Licensee) and Documentation are proprietary and confidential information of The Foundry or, as the case may be, the Third Party Licensors, and that all such information and any communications relating thereto (collectively, "Confidential Information") are confidential and a fundamental and important trade secret of The Foundry or the Third Party Licensors. Licensee shall disclose Confidential Information only to Licensee's employees who are working on an Authorized Project and have a "need-to-know" of such Confidential Information, and shall advise any recipients of Confidential Information that it is to be used only as authorized in this Agreement. Licensee shall not disclose Confidential Information or otherwise make any Confidential Information available to any other of the Licensee's employees or to any third parties without the express written consent of The Foundry. Licensee agrees to segregate, to the extent it

can be reasonably done, the Confidential Information from the confidential information and materials of others in order to prevent commingling. Licensee shall take reasonable security measures, which such measures shall be at least as great as the measures Licensee uses to keep Licensee's own confidential information secure (but in any case using no less than a reasonable degree of care), to hold the Software, Documentation and any other Confidential Information in strict confidence and safe custody. The Foundry may request, in which case Licensee agrees to comply with, certain reasonable security measures as part of the use of the Software and Documentation. Licensee acknowledges that monetary damages may not be a sufficient remedy for unauthorized disclosure of Confidential Information, and that The Foundry shall be entitled, without waiving any other rights or remedies, to such injunctive or equitable relief as may be deemed proper by a court of competent jurisdiction.

### **SECTION 15. INSPECTION AND INFORMATION.**

Licensee shall advise The Foundry on demand of all locations where the Software or Documentation is used or stored. Licensee shall permit The Foundry or its authorized agents to inspect all such locations during normal business hours and on reasonable advance notice.

The Software may include mechanisms to collect limited information from Licensee's computer(s) and transmit it to The Foundry. Such information (the "Information") may include details of Licensee's hardware, details of the operating system(s) in use on such hardware and the profile and extent of Licensee's use of the different elements of the Software. The Foundry may use the Information to (a) model the profiles of usage, hardware and operating systems in use collectively across its customer base in order to focus development and support, (b) to provide targeted support to individual customers, (c) to ensure that the usage of the Software by Licensee is in accordance with this Agreement and does not exceed any user number or other limits on its use, and (d) to advise Licensee about service issues such as available upgrades and maintenance expiry dates. To the extent that any Information is confidential to Licensee it shall be treated as such by The Foundry. To the extent that any Information constitutes personal data for the purposes of the Data Protection Act 1998 it shall be processed by The Foundry in accordance with that Act and with The Foundry's privacy policy (see <http://www.thefoundry.co.uk/privacy/>).

### **SECTION 16. NONSOLICITATION.**

Licensee agrees not to solicit for employment or retention any of The Foundry's current or future employees who were or are involved in the development and/or creation of the Software.

### **SECTION 17. U.S. GOVERNMENT LICENSE RIGHTS.**

The Software, Documentation and/or data delivered hereunder are subject to the terms of this Agreement and in no event shall the U.S. Government acquire greater than RESTRICTED/LIMITED RIGHTS. At a minimum, use, duplication or disclosure by the U.S. Government is subject to the applicable restrictions of: (i) FAR §52.227-14 ALTS I, II and III (June 1987); (ii) FAR §52.227-19 (June 1987); (iii) FAR §12.211 and 12.212; and/or (iv) DFARS §227.7202-1(a) and DFARS §227.7202-3.

The Software is the subject of the following notices:

- \* Copyright © 2013 The Foundry Visionmongers, Ltd.. All Rights Reserved.
- \* Unpublished-rights reserved under the Copyright Laws of the United Kingdom.

**SECTION 18. SURVIVAL.**

Sections 2, 3, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20 shall survive any termination or expiration of this Agreement.

**SECTION 19. IMPORT/EXPORT CONTROLS.**

To the extent that any Software made available hereunder is subject to restrictions upon export and/or reexport from the United States, Licensee agrees to comply with, and not act or fail to act in any way that would violate, the applicable international, national, state, regional and local laws and regulations, including, without limitation, the United States Foreign Corrupt Practices Act, the Export Administration Act and the Export Administration Regulations, as amended or otherwise modified from time to time, and neither The Foundry nor Licensee shall be required under this Agreement to act or fail to act in any way which it believes in good faith will violate any such laws or regulations.

**SECTION 20. MISCELLANEOUS.**

This Agreement is the exclusive agreement between the parties concerning the subject matter hereof and supersedes any and all prior oral or written agreements, negotiations, or other dealings between the parties concerning such subject. This Agreement may be modified only by a written instrument signed by both parties. If any action is brought by either party to this Agreement against the other party regarding the subject matter hereof, the prevailing party shall be entitled to recover, in addition to any other relief granted, reasonable attorneys' fees and expenses of litigation. Should any term of this Agreement be declared void or unenforceable by any court of competent jurisdiction, such declaration shall have no effect on the remaining terms of this Agreement. The failure of either party to enforce any rights granted hereunder or to take action against the other party in the event of any breach hereunder shall not be deemed a waiver by that party as to subsequent enforcement of rights or subsequent actions in the event of future breaches. This Agreement shall be governed by, and construed in accordance with English Law.

The Foundry and Licensee intend that each Third Party Licensor may enforce against Licensee under the Contracts (Rights of Third Parties) Act 1999 ("the Act") any obligation owed by Licensee to The Foundry under this Agreement that is capable of application to any proprietary or other right of that Third Party Licensor in or in relation to the Software. The Foundry and Licensee reserve the right under section 2(3)(a) of the Act to rescind, terminate or vary this Agreement without the consent of any Third Party Licensor.

Copyright © 2013 The Foundry Visionmongers Ltd. All Rights Reserved. Do not duplicate.