ASSIMILATE

SCRATCH User Guide

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Contents

01 - Introduction

01 - SCRATCH + SCRATCH Lab

GENERAL

SCRATCH® and SCRATCH Lab™ are digital imaging and file-based workflow tools for post-production, offering a wide variety of features from high performance playback to conform, editing, color grading, compositing and finishing. All in a single system with advanced data-management and software interfaces for third party integration. The next paragraph contains a feature matrix on the difference between SCRATCH®and SCRATCH Lab™.

As of version 6, SCRATCH is available on both Windows and OS X. Projects are **interchangeable** between different platforms as well as different products. However, featured used in a project created on one product which are not available on the other product will not render. Product licenses are linked to a single system and are not interchangeable.

It is recommended that you read this manual carefully when planning DI projects with SCRATCH. This manual is available both on-line on the Assimilate Support site at www.assimilatesupport.com and as a pdf download from that same site. Only the on-line version is updated when updates are released for the same version. The pdf is created only with the first release of a new version. The Support Site requires you to register but is open to anyone.

Next to this manual and the Support Site there are additional sources of information to learn about SCRATCH and to post questions you might have.

TECHNICAL SUPPORT

For Technical Support for SCRATCH, send an email to support@assimilateinc.com . Indicate your company, what build of SCRATCH you are running, your hardware configuration, and a clear description of the problem you are experiencing, with steps for reproducing the problem. This service is only available if you have a valid SCRATCH support contract.

SCRATCH-LIST

To keep up to date about the latest developments, tips and tricks, and general SCRATCH information, join the SCRATCH User Group list. Register at http://groups.google.com/group/**scratch-list** with the email account you wish to use. Once you are authorized, you will receive emails that are posted to the Scratch-List group. Each email is identified with [SCRATCH-LIST] in the message subject, so they can be easily identified and sorted in your email reader.

The Scratch-List is an excellent resource for users of any level. Post questions, opportunities, recent projects, or any other SCRATCH-related topics; then watch for feedback from SCRATCH users around the world.

ACKNOWLEDGEMENTS

The following non-proprietary code is used within SCRATCH and derived applications:

FreeType (uses version 2.3.10)

Copyright (c) 1996-2002 The FreeType Project (www.freetype.org)

All rights reserved.

The OpenGL Extension Wrangler Library (1.3.3)

Copyright (C) 2002-2008, Milan Ikits <milan.ikits@ieee.org>

Copyright (C) 2002-2008, Marcelo E. Magallon <mmagallo@debian.org>

Copyright (C) 2002, Lev Povalahev <levp@gmx.net>

All rights reserved.

Half float pixel format type

This is the format used on the graphics hardware, and the conversion from, and to this format is provided through software, which is:

Copyright (c) 2002, Industrial Light & Magic, a division of Lucas Digital Ltd. LLC

All rights reserved.

OpenEXR image format

Copyright (c) 2004, Industrial Light & Magic, a division of Lucasfilm Entertainment Company Ltd. Portions contributed and copyright held by others as indicated. All rights reserved.

XML toolkit from the GNOME project (libXML2 version 2.6.11)

Copyright (C) 1998-2003 Daniel Veillard. All Rights Reserved.

Additional notices for files contributed to the libXML project:

Copyright (C) 2001 Bjorn Reese <breese@users.sourceforge.net>

Tiff library:

Copyright (c) 1988-1997 Sam Leffler

Copyright (c) 1991-1997 Silicon Graphics, Inc.

Jpeg library:

The Independent JPEG Group's JPEG software

This software is copyright (C) 1991-1998, Thomas G. Lane.

JPEG 2000 Format image format support is handled through:

Kakadu V6.1, License 00845

Copyright (c) 2001, David Taubman, The University of New South Wales (UNSW)

JasPer

Current version: 1.701.0

JasPer License Version 2.0

Copyright (c) 1999-2000 Image Power, Inc.

Copyright (c) 1999-2000 The University of British Columbia

Copyright (c) 2001-2003 Michael David Adams

All rights reserved.

OFX : Open Plug-Ins For Special Effects

Basic Host implementation uses the specification headers provided by the OFX project, which are:

Copyright (c) 2003-2009, Open Effects Association.

All rights reserved.

SCRATCH DNxHD MXF - Patent and third party libraties

For its implementation of (DNxHD) MXF format, SCRATCH uses a number of third party Patents and software libraries.

AVID

DNxHD Patent rights and Notices. The MXF DNxHD implementation in SCRATCH is manufactured by ASSIMILATE INC under license to pending patent applications and issued patents: [U.S. Patent Application 10/817,209, allowed. U.S. Patent 7,403,561. U.S. Patent Application No. 12/215,228, currently pending. Canadian Patent Application 2521467, allowed. European Patent 1629675. European Patent Application 07121939, published as European patent publication 1892965, currently pending.]

AAF SDK

The Source Code version of the AAF SDK used in SCRATCH is available from the Advanced Media Wokflow Association, Inc., under the terms of the AAF SDK Public Source License Version 2.0. A copy of this license is available at www.amwa.tv The terms of the SCRATCH End User License Agreement do not apply to the AAF SDK, neither is any Contributors to the AAF SDK responsible or liable for the terms and conditions in the SCRATCH License Agreement.

APPLE ProRes Encoder

Apple Licenses the Apple Technology to Assimilate on an "AS IS" basis. APPLE MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT, REGARDING THE APPLE TECHNOLOGY OR ITS USE AND OPERATION ALONE OR IN COMBINATION WITH OTHER SOFTWARE OR HARDWARE. APPLE DOES NOT WARRANT THAT THE FUNCTIONS CONTAINED IN THE APPLE TECHNOLOGY WILL MEET PARTICULAR REQUIREMENTS, OR THAT THE OPERATION OF THE APPLE TECHNOLOGY WILL BE UNINTERRUPTED OR ERROR-FREE, OR THAT DEFECTS INT HE APPLE TECHNOLOGY WILL BE CORRECTED.

FFmpeg

SCRATCH uses code of FFmpeg licensed under the LGPLv2.1 and its source can be downloaded here.
Assimilate Inc does not own any of the FFmpeg source code. More information on the ownership of FFmpeg can be found at http://www.ffmpeg.org/index.html.

Various web libraries

- mpeg4ip from the mp4creator - lib v1.6.1c - (MPL 1.1). Portions of this library were created by Cisco Systems Inc. are Copyright (C) Cisco Systems Inc. 2001. All Rights Reserved.

- OpenSSL - Copyright (c) 1998-2011 The OpenSSL Project. All rights reserved. This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (http://www.openssl.org/).

- libfaac v1.28 - (LGPL) Copyright (C) 2001 Menno Bakker, Copyright (C) 2002, 2003 Krzysztof Nikiel. libfaac uses KISS FFT, Copyright (c) 2003-2004, Mark Borgerding.

- Parson - Copyright (c) 2013 Krzysztof Gabis.

- ftplib - Copyright (c) 2000-2006, The Perl Foundation - (AL 2.0)

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02 - Products Features Difference Matrix

GENERAL

Throughout this manual, all sections describing functionality that is not available in SCRATCH Lab are marked with [Lab]. This can either be a single paragraph or a whole chapter; in the latter case the symbol is placed at the first paragraph of the chapter. In case a section applies only to SCRATCH Lab it is marked with [Lab].

The table below shows the differences between both SCRATCH products, as well as the difference between the Windows and OS X versions.

Products Features Difference matrix	SCRATCH®	SCRATCH Lab™
CONstruct Tools		
De-Construct	✔	O
Grading and Compositing:		
Multiple (3D) layering	✔	O
Staging - data management dimension	✔	O
Structure View - composite tree	✔	O
6-Vectors secondary grading	✔	O
Tracker	✔	O
Stabilize	✔	✔
Qualifiers	✔	O
Masks - multiple 2D Shapes	✔	O
Textures	✔	O
Camera	✔	O

Products Features Difference matrix	SCRATCH®	SCRATCH Lab™
Other modules		
Vector Paint utility	✔	**O**

Platform differences	Windows	OS X
SDI	NVIDIA Quadro / AJA / Bluefish / DeckLink	AJA / Bluefish / DeckLink

02 - Getting Started

01 - Software Installation

SOFTWARE INSTALLATION

Getting SCRATCH up and running takes just three easy steps:

1. Install the SCRATCH software

2. Generate an initial log file and send it to the ASSIMILATE licensing email address

3. Activate the license file you receive back from ASSIMILATE

SYSTEM REQUIREMENTS

SCRATCH's performance relies primarily on the speed of the graphics accelerator and disk sub-system in your host computer system. System RAM and CPU type are also important but in general with more latitude. Below is a list of requirements, recommendations and considerations when setting up a new system.

HARDWARE

- Graphics accelerator. SCRATCH will work with most modern graphics cards with OpenGL and OpenCL support. SCRATCH is tested on high-end NVidia Quadro and AMD Firepro cards. Please see for an up to date overview of tested graphics cards and recommended drivers - in the Driver Chart available on the Support Site. The exact requirement of the graphics cards also depends on the type of media that you work with: some media require a GPU for debayer while other rely more on CPU decompressing. Some media will benefit from multiple graphic cards in the same system. The recommended minimum resolution to work on is 1920x1200. SCRATCH supports various SDI output cards: NVIDIA, Bluefish, AJA and DeckLink.

- High-speed disk sub-system. SCRATCH plays back media files directly from the disk drives without converting to an intermediate file format; therefore the performance of SCRATCH is tied directly to the performance of the disk sub-system. Depending on the type of footage you are planning to process, you will need more or less bandwidth / throughput from your disk system.

    o For real-time playback of 2k DPX material you need at least 350 - 400 Mb/s.

    o For compressed material (like e.g. RED r3d; 35-60 Mb/s) disk throughput requirements is less but more processing power is required from the CPU. Note that to render / write uncompressed material you will need 350-400 Mb/s write speed again.

    o If you are planning stereo projects or using 4k uncompressed footage, disk performance requirements will more than double.

- x86 64bit compatible CPU. Even though SCRATCH relies in general more heavily on the GPU than the CPU, the choice of CPU is important. Some file formats require substantial CPU power for decoding next to GPU power for debayer: e.g. RED, Sony. Another factor might be that certain plug-ins you are planning to use require CPU processing.

- 12GB Memory minimum. In a 64 bit operating system there is virtually no limit to the amount of memory that can be used. However, the marginal utility of increasing quantities of memory do diminish; more memory will allow SCRATCH to cache more data. However, you will primarily benefit from that larger cache as long as your media working-set fits in the cache completely.

- PCI slots. Make sure the system has enough expansion slots to accommodate current and future needs; e.g. professional sound card, disk controllers, capture card, RS422 connector for deck control on play-out, decoder cards (r3d), etc. For the MAC - you can use an Extension Chassis.

OPERATING SYSTEM

As of version 6.0 SCRATCH is released as a 64bit application on both **Windows** and **OS X**. For Windows - either version 7 or 8 or higher is required. Windows Server variants have not been actively tested. The minimum supported version for OS X is 10.6.6.

INSTALLING THE SCRATCH SOFTWARE

SCRATCH is typically downloaded from the Assimilate Support Site as a .zip or .pkg file. In the case of a .zip file, you need to unzip the file before you can begin the installation. The file can be unzipped using a default zip utility. Once the file is unzipped, there is a folder with two files in it. In case of the Windows installer these are AssimSetup64.msi and ReleaseNotes.txt. The OS X installer comes in the form of a .pkg file instead of a .msi file. The ReleaseNotes.txt file is copied into the main SCRATCH install directory by the installer. See below for more information about this file.

WINDOWS INSTALLATION

SCRATCH is installed using the .msi file. Double-clicking on this file launches the SCRATCH installer program. When the installer first launches, an initial dialog is shown, indicating that you are about to install SCRATCH on your system.

Installing SCRATCH is a standard Windows install:

- read the license agreement and confirm / agree to the terms

- set the install folder

- copy and install the program files

Note that as of version 8 - the Codec Support Pack (CSP) for additional media format support and the AMT library (for creating AVID compatible MXF) are included in the installer, where as before these were separate installers.

MAC OS X INSTALLATION

The install program in OS X is started by double-clicking the .pkg file and goes through a similar series of steps as the Windows install, standard to an OS X installation.
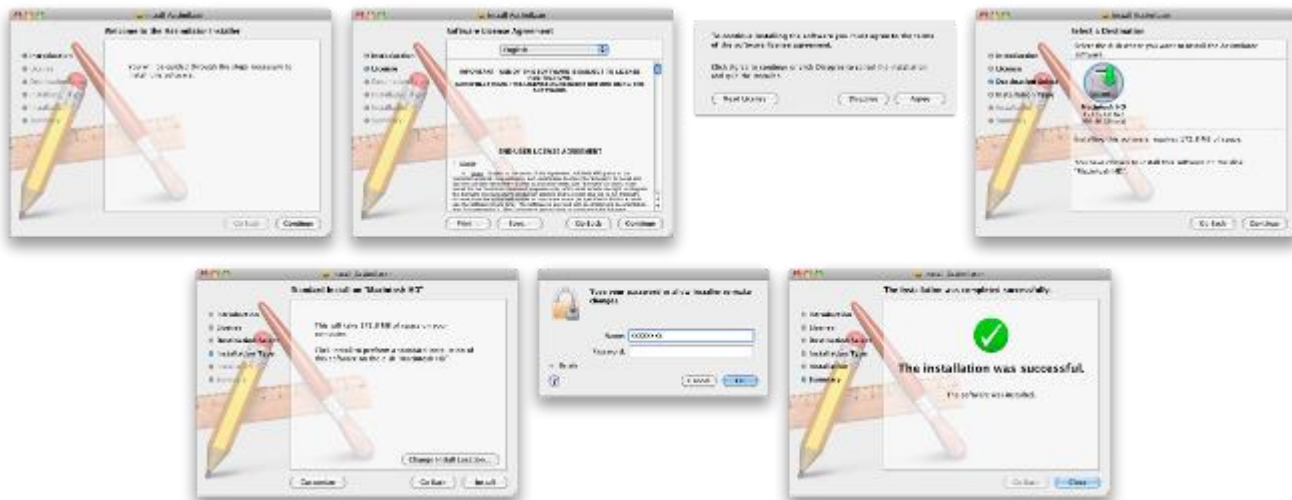

Installing SCRATCH is a standard OS X install:

- read the license agreement and confirm / agree to the terms

- set the install folder

- enter administrator credentials for installation

- copy and install the program files

INSTALLED FILES

PROGRAM DATA

WINDOWS

The default installation folder for **Windows** is C:\Program Files\Assimilate which contains three sub-folders:

- **Bin64 -** This folder contains the SCRATCH executable application and all supporting .dll files. There are also three additional executable programs in the bin64 folder; acopy.exe, diskio.exe and crypt3dl.exe. These are command-line utilities that are used for copying media, analyzing disk performance and encrypting 3D LUTs respectively. See Chapter 10 – Utilities and Customization for details on these utilities.

- **Fonts -** The SCRATCH UI can be customized to use any font loaded under Windows. These fonts are loaded simply to ensure that a default font is available. See Chapter 10 – Utilities and Customization for more information about customizing the SCRATCH UI.

- **Settings -** Containing the default configuration files and a number of predefined *Look-Up-Tables* (LUT files). Do not modify any of these files directly. Configuration and customization of SCRATCH is covered in detail in Chapter 10 – Utilities and Customization.

OS X

On **OS X** the installation folder is /Applications and in the /Library/Application Support/Assimilator/Defaults/ the default configuration files are stored.

APPLICATION DATA

Once the software is launched, a folder is created in (Win) C:\ProgramData\Assimilator / (OS X) /Library/Application Support/Assimilator/ for storing application data that carry over between software versions. These files and folders are not modified when the SCRATCH software is updated.

Note: The Application Data folder is hidden by default in Windows. In order to see this folder you may need to modify the Windows Explorer settings so that hidden files are shown.

Project

Everything pertaining to a particular SCRATCH Project is contained within that Project's folder, allowing for easy backup and transportation of SCRATCH Projects. The SCRATCH Project folder contains a sub-folder per project created. The individual project sub-folder in turn contains - among others:

- **Project.db8**; the database containing all project data. Project data is saved automatically on time intervals or when changing between modules. Note that in prior versions this file had the **.db** extension. When opening an existing project, a new database file is created and the project data is copied into that. The old database file remains in the folder but is no longer updated.

- **Project.bak / Project.$.bak**; backup files - when entering a project a copy of the project database is created and renamed to .bak. Any previous backups are renamed with a version number. There is a maximum of 3 backups, older ones are removed.

- **ProjectCrash.bak / CrashLog.log**; when entering a new a session after a crash, SCRATCH will automatically try to create a backup of the last project database that was used and make a copy of the log file that was written when the crash occurred.

- **Project.dbl**; file used for database locking so as to prevent others from entering the same project at the same time possibly causing write conflicts.

- Additional **sub-folders** with a specific project:

    - conform - default location for loading / saving conform files.
    - Constructs - default location for import / export of project data.
    - Colors - default location for saving / loading shot color settings.
    - Temp - default location to store xml data to work with the custom command and project auto-export function.
    - Init - used with XML scripting options for updating a project data through the Watch folder.
    - Animation - default location for saving / loading animation or tracker data.

- Snapshot - default folder for saving snapshot images in the Player.
- plugins - default location for storing / loading plug-in preset files specific to your project.

Users

This folder contains:

- A sub folder for each local SCRATCH user created. Each user folder contains a user settings file, any gallery items (looks & grades) that the user saved and possibly customized panel mappings.

- A Settings folder that contains an Output and Plugins sub-folder. Both are used to store templates and presets that are available to all local users and are not specific to any particular project.

Note: The location of the Project- and Users- sub folders can be customized (see Chapter 3 – The Start-up Screen) and optionally be located on a network drive. that way they can be shared by multiple SCRATCH systems.

Settings

This folder contains several configuration files, none of which should be edited directly. For information on customizing and adjusting these setting files, see Chapter 10 – Utilities and Customization. This folder also contains the **LOGS** sub-folder: each time SCRATCH is run, a new log file is generated in this folder. The Assimilator.log file is the most current log from the last time SCRATCH was run. Previous versions are numbered from 1 to 10 with 1 being more recent and 10 being the oldest. Only the last 10 log files are kept. Older log files are removed each time SCRATCH is run.

Tip: The log files are used to troubleshoot issues with the SCRATCH software. Any time you have strange behavior from SCRATCH, exit the program and copy the Assimilator.log file from the LOGS folder to another location. This allows you to preserve it and send it to Technical Support.

UPGRADING SCRATCH

The SCRATCH software is updated regularly to add new functionality and improve existing features. To upgrade to a new version of the software, follow these steps:

1. **Back-up** all project and user information. This information should be backed up regularly, but it is most important to have a backup version of your project information before installing a new version should you ever need to revert back to a previous version for any reason.

2. Remove the SCRATCH software using Add/Remove Programs in the Windows Control Panel.

3. Install the new version of software by running the .msi installer that was provided.

Note: A new SCRATCH license may be required when upgrading to new versions of the software. Check the Release Notes that are included with new versions of the software for information about licensing before beginning the install process.

Note: It is most **important** that you check the **Release notes** of a new version to make sure it is fully **backward compatible** with the current version you are running. It is discouraged to switch to a new version while working on a project but rather wait to install the new version when starting a new project .

02 - Licensing the Software

ACTIVATING THE SOFTWARE

In order to run SCRATCH, you need a license. When you launch SCRATCH the first time a dialog will show for entering a license key.

License Activation		
Lic. Key	xxxxx-xxxxx-xxxxx-xxxxx-xxxxx-xxxxx-xxxxxx	Paste
Email	*to activate the free Player, enter your email here*	
There are 60 days left on the license..		
Cancel	Log Files..	Activate Key..
Activate Free Player version..		
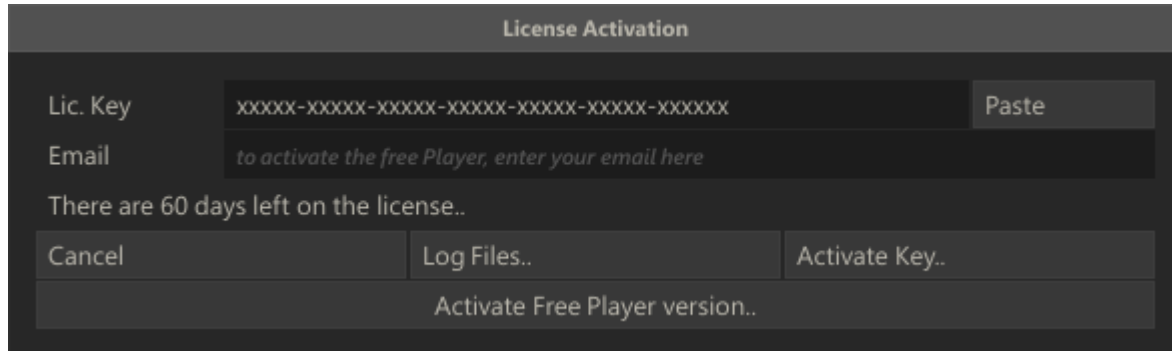
A license key is formatted as "xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx" - a total of 36 characters including the separators. You can enter that manually or copy the key from the source document (eg. email) to the clipboard and use the **Paste** button in the dialog. After entering a proper key the **Activate** button will turn into an enabled state.

When you click the **Activate** button SCRATCH will contact the Assimilate activation server over the internet and send the key along with your system's details to validate the key and generate a license for the specific system. If the key validates, the license is then automatically installed. A second dialog will pop up asking you to restart SCRATCH. On Windows this restart will be done automatically - on OS X SCRATCH will just close down and needs to be started manually again.

Note: The system needs a working internet connection for on-line activation.

LICENSE ACTIVATION AND PRIVACY POLICY

When Activating the software with a license key, SCRATCH will send information about your system over the internet to Assimilate' server in order to create a license. The information sent is the same data as that which is written in a standard SCRATCH log-file and contains information about the system hardware (CPU, Memory and GFX specifications), the Operating System (Type and version) and data items like system-name, system-id and disk-id to identify the system in order to generate a system specific license for it. All information is send over a secure (https) connection and is stored in the Assimilate database and only used for generating a license or referencing in case of a problem with SCRATCH and/or the license. This information will never be sold, traded, or otherwise distributed to another party.

LICENSING QUESTIONS OR ISSUES

For any licensing questions of issues contact licensing@assimilateinc.com and always include an Assimilator.log file with the request. If you experience problems with activating the software make sure:

- The system has a working internet connection - you can check this by opening an internet browser on the computer and open e.g. the Assimilate homepage at http://www.assimilateinc.com.

- Check if there are any firewalls blocking the system from connecting the Assimilate server. A firewall can be switched on on the system itself or can be located elsewhere in the network. In the former situation, try switching off the firewall temporarily in the latter case - contact your network administrator.

- In some cases you might get a 'key in use' message after activating. In that case you either used a key that is already used by another system or either the system-id or disk-id of the system you are activating from have changed. Contact Assimilate and include both the latest log file and the key you are using to activate.

UPDATING A LICENSE

To update an existing license file you navigate to the System Settings menu (discussed in detail in the next chapter) and select the **License** button on the far right of the menu panel to open the License dialog.

03 - Starting the Software

THE SCRATCH USER INTERFACE

In broad terms, the SCRATCH software is divided into three sections: The Startup Screen, the CONstruct and the Player. Throughout each of these sections, the SCRATCH User Interface (UI) remains consistent.

The UI itself is divided into two distinct areas. The Main Menu panel occupies the lower portion of the screen and has a Menu Bar across the entire top. Above this is the main workspace area of the UI, called the View Port.
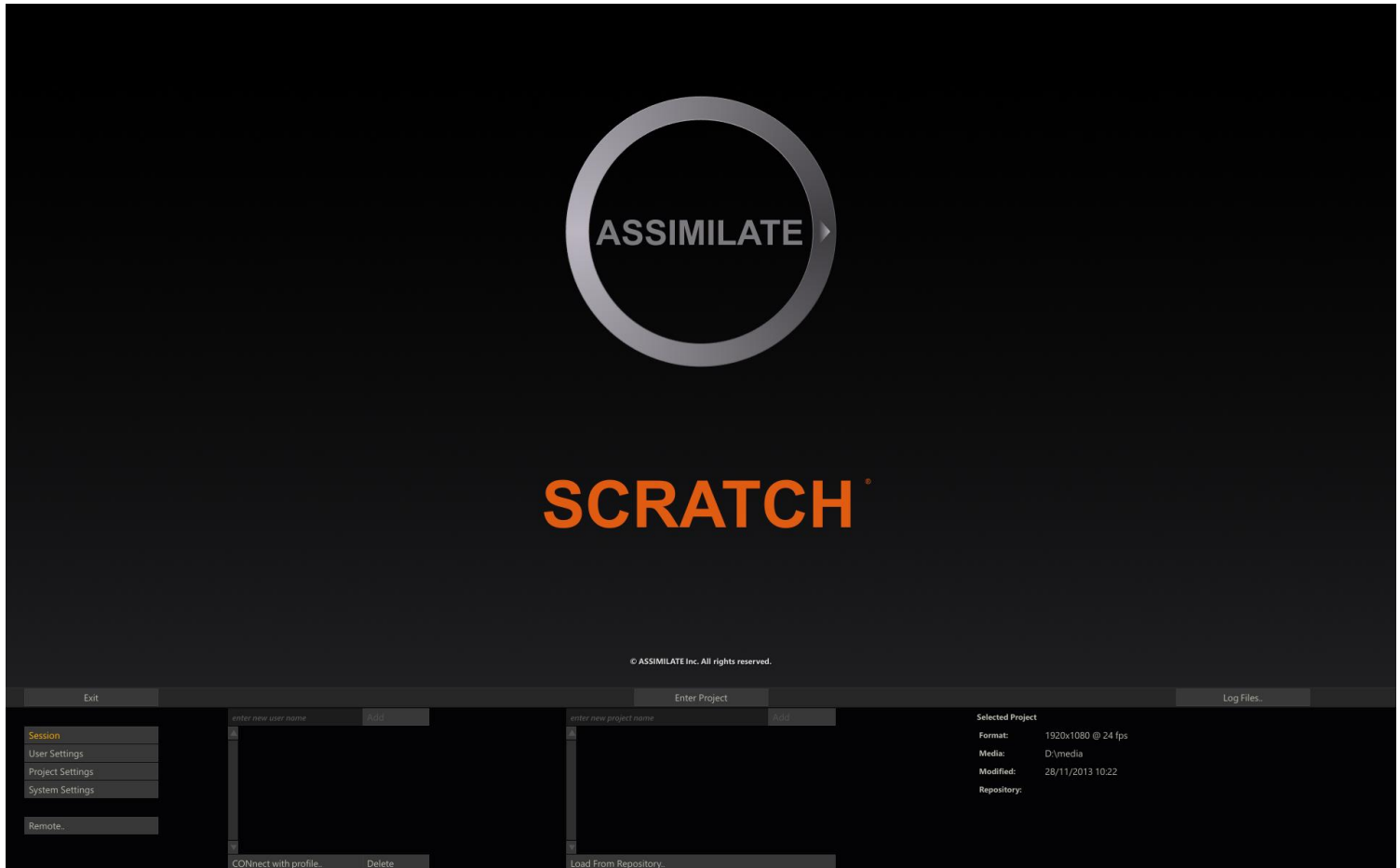
When SCRATCH is launched, the first screen you will see is the Startup Screen. The Main Menu displays Session, User, Project, and System Settings options.

Tip: The View Port area of the Startup Screen can be customized with your own logo. See Chapter 11 – CUSTOMIZING SCRATCH for more information.

UI COMPONENTS

Navigating through the SCRATCH UI is done with several types of elements and functions:

- Gestures
- Single-Action Buttons
- Menu Buttons
- Pull-Down Menus
- Text-Entry Slates
- Text Selection Slates
- Numerical Slates
- On-screen Calculators
- Color Selection Palettes
- Special Purpose Interface Elements
- Quick Keys

GESTURES

SWIPING

SCRATCH uses a method called 'swiping' to control various UI elements. A swipe simply means to move the cursor quickly off one edge of the UI. When the cursor hits the edge of the UI, whatever swipe action is attached to that edge of the UI will be executed. This may consist of revealing a menu or clearing a selection. You'll see swiping referred to in many places throughout this manual.

CONTROL GEARING

Control Gearing is a gesture for incrementing and decrementing Numerical Slates, similar to using a radio dial. See the section NUMERICAL SLATES for details on how Control Gearing is used.

SINGLE-ACTION BUTTONS

A single-action button performs one action when clicked. Examples of these are the EXIT and ENTER PROJECT buttons shown on the Startup Screen. If a button is grayed out, then the function that button performs is not currently available.

CONFIRMING SINGLE-ACTION BUTTONS

Some single-action buttons will require a confirmation to ensure that you really do want to perform the operation. In these cases, the button will be replaced by a confirmation button, which is really two buttons in one.

Click on the Yes / OK / Accept part of the button to confirm the action or click on the No / ESC / Abort part of the button to cancel the action.

The Enter key on the keyboard can also be used to confirm the action.

Moving your cursor off the button will cancel the action automatically.

• Quick Key: Enter	» Confirm Action
• Quick Key: Esc	» Cancel Action

MENU BUTTONS

Menu Buttons are used to select between different sub-menus within the Main Menu. The Menu Button will highlight to indicate which sub-menu has been selected and the Main Menu will update to display that sub-menu.

An example of this are the four Menu Buttons on the left side of the Startup Screen; Session, User Settings, Project Settings, System Settings. Each of these will call up a different sub-menu.

PULL-DOWN MENUS

Clicking on a pull-down menu will open a list of options for that button.
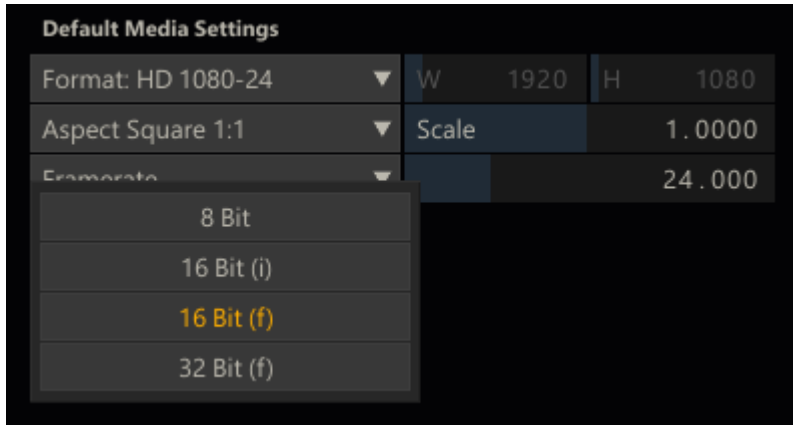
The currently selected option will have its text highlighted. The option under the cursor will have the background of the button highlighted. Options that are not available will be grayed out.

Click on any option to select it and close the list.

Tip: Pull-down menus will stay open after a single click with the mouse or pen. There is no need to keep the mouse or pen pressed while selecting from a pull-down menu. This makes the SCRATCH UI easier to use with less strain on the muscles of the hand.

TEXT ENTRY SLATES

Text Entry Slates are areas where specific alpha-numeric information can be entered. They are flat, non-shaded areas. Examples of Text Entry Slates are the New User and New Project areas on the Startup Screen.

Clicking on a Text Entry Slate will change the cursor from the default cross to an I-Beam, indicating that the software is ready for text input. Text can then be entered from the keyboard and confirmed with the ENTER key, which will end the text input.

Note: Be sure to hit ENTER after completing a text entry. Clicking on another part of the UI will revert the text entry back to its previous version and cancel any new text entry.

Tip: Text Entry Slates follow all of the usual text editing rules for Windows such as Cut and Paste (using CTRL-C and CTRL-V), partial selection, backspace etc.

Note: SCRATCH maintains a history of values entered in Text Entry Slates. Using the Up and Down arrow keys while a Text Slate is selected will scroll through previous values entered in any other Text Slate in SCRATCH. The history is maintained until exiting a Project. This function can be very useful when updating multiple Text Slates with more or less similar values - e.g. renaming a number of shots.

• Quick Key: Up / Down arrow	» scroll through values previously entered in other Text Entry Slates

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TEXT SELECTION SLATES

Text Selection Slates are lists of options that can be selected. They are similar to a pull-down menu except all options are visible at all times rather than having to click on a single button to reveal the list.
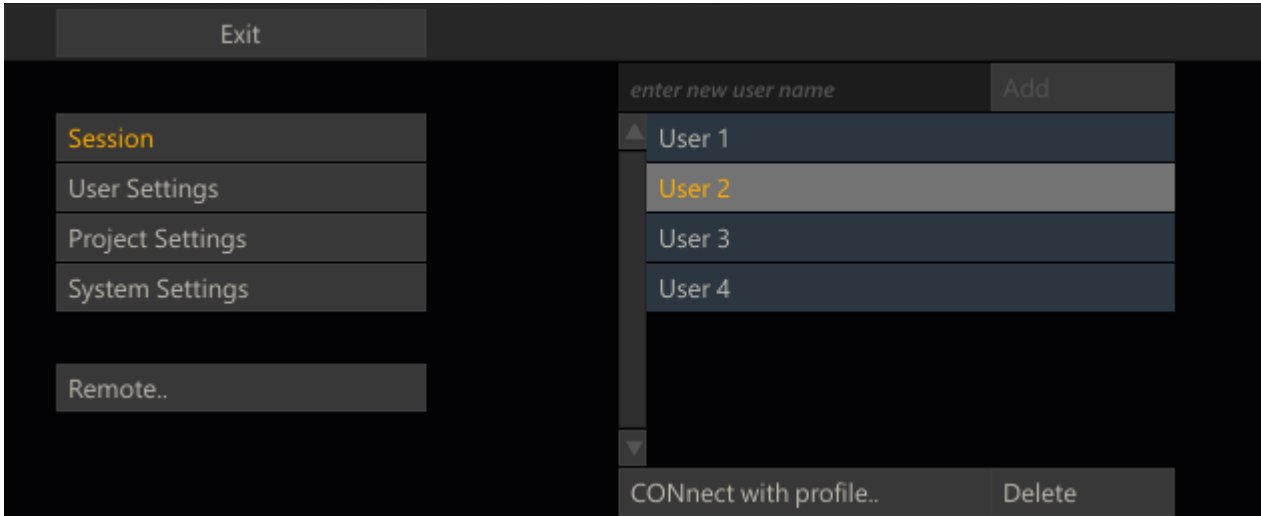
Text Selection Slates cannot be directly edited; however, the text they contain is usually controlled by a Text Entry Slate. Examples of Text Selection Slates are the Users and Projects lists on the Startup Screen.

NUMERICAL SLATES

Numerical Slates are used for inputting numerical data for various properties. You can input or change a value of a Numerical Slate in several ways.

CONTROL GEARING

To use Control Gearing, click and hold over the current number in a Numerical Slate and make a circular motion with the cursor. This will act as a control dial which will increment (clockwise motion) or decrement (counter clockwise motion) the numerical value. You can hold down the Quick Key: Shift to change the sensitivity of the control gearing.

- Quick Key: Shift   » Changes the sensitivity of Control Gearing

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The sensitivity of the Control Gearing and Shift-modifier can be customized as a User Setting. See Chapter 3 – THE STARTUP SCREEN for information about how to change these values for each User.

The Numerical Slates have a Fill Gauge that indicates where in the overall range of values the current number falls. The Fill Gauge will gradually fill in the area behind the Numerical Slate's label. Once the Fill Gauge moves to the right edge of the label, the maximum value has been reached and the value cannot be incremented any further.
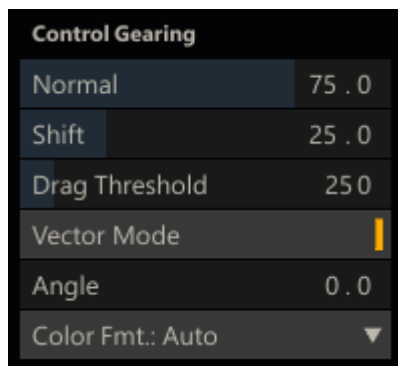
CALCULATOR

Clicking once on the number in a Numerical Slate will invoke the SCRATCH Calculator.
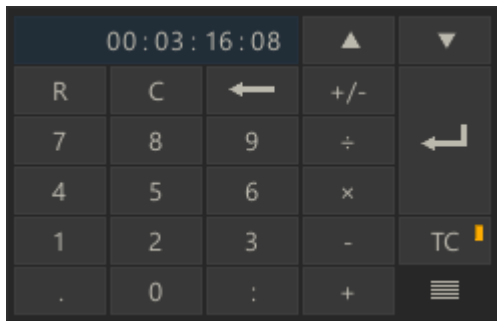
Tip: You can move the Calculator's position by clicking down on the gripper in the lower right of the Calculator panel. If you hover over the gripper, the main cursor will change to a translate cursor, indicating that repositioning is possible.

To enter a new value, simply click on the appropriate numbers and click the enter arrow. You can also use the number pad on the computer's keyboard to enter values. The numerical entry will update after the Enter key is pressed.

To remove a single digit entry, click on the backspace arrow; or, to clear the Calculator's entire Entry Slate, click on the C button.

Illegal Value Indicator

If you attempt to exceed a value's upper or lower limit, the Calculator displays the number in red. Use **Clear** or **Backspace** to set the Slate to a legal value. If you hit ENTER, the maximum or minimum value will be inserted automatically.

Increment and Decrement

To increment or decrement an existing value by a pre-defined amount, first enter the amount and then click on either the up or down arrow at the top right of the Calculator panel. Each click on the arrow will increase or decrease the current value by the amount you typed in, and the Calculator will display an equation representing the current increment or decrement.

Tip: By default, the increment and decrement are set to 1.

You can also use the following Quick Keys to achieve the same effect:

• Quick Key: Up Arrow	» Increments the value
• Quick Key: Down Arrow	» Decrements the value
• Quick Key: Right Arrow	» Increments the value
• Quick Key: Left Arrow	» Decrements the value

Calculations

Normal calculations can be made on numbers by using the ÷, x, - and + buttons. For example, to divide the current number in half, click on the ÷ button and then click on 2 and Enter.

Numbers can also be quickly swapped from positive to negative or vice-versa by using the +/- button.

Time Code and Frames

The TC button toggles the Calculator between Frame Mode and Time Code Mode. When in Time Code Mode, values are entered as HH:MM:SS:FF, rather than as pure frame counts. This only applies to Numerical Slates that accept time codes as a value. The TC button highlights when the Calculator is in Time Code Mode.

Reset

An individual value can be reset back to its default by clicking on the **R** button, located on the top left of the Calculator's panel.

Magic Number Picker

The Calculator has the ability to recognize and grab any number that exists on the current menu page and place it as the current value in the Calculator. For example, if a Scale X Numerical Slate has a value of 90, and a Scale Y Numerical Slate has a value of 50, you can set the Scale X value to 50 by clicking on the current value of Scale X to open the Calculator;

then click on the Scale Y value of 50 and the value of 50 is immediately entered into the Numerical Slate for Scale X. This is a quick way of matching values between different parameters without typing the entire value.

Exiting

To close the Calculator and accept the current value, press the Enter button or use the Quick Key: Enter on the keyboard.

• Quick Key: Enter	» Accept the current value and close the On-screen Calculator

To remove the Calculator without changing any values, use the Quick Key: Esc or swipe the cursor off the edge of the UI.

• Quick Key: Esc	» Clear the On-screen Calculator
• Swipe Action: Left or Right	» Clear the On-screen Calculator

LOCKING AND UNLOCKING LINKED SLATES

Some Numerical Slates, such as Scale X and Scale Y, are locked together so that modifying the value of one will automatically modify the value of the other. This is particularly convenient for parameters, such as Scale, which typically are modified together.

However, there are instances when these values need to be modified separately. To do this, first the Slates must be unlocked from one another.

Locked Slates are indicated by a white Link Bar between the two Slates. In the image below, the Scale X and Scale Y values are linked.

Trans X	0.000	Scale X	100.000	Rotate X	0.000	Pivot X	0.000	Softness	0.000
Trans Y	0.000	Scale Y	100.000	Rotate Y	0.000	Pivot Y	0.000	Smooth	
Trans Z	0.000			Rotate Z	0.000	Pivot Z	0.000	50.0	100.0
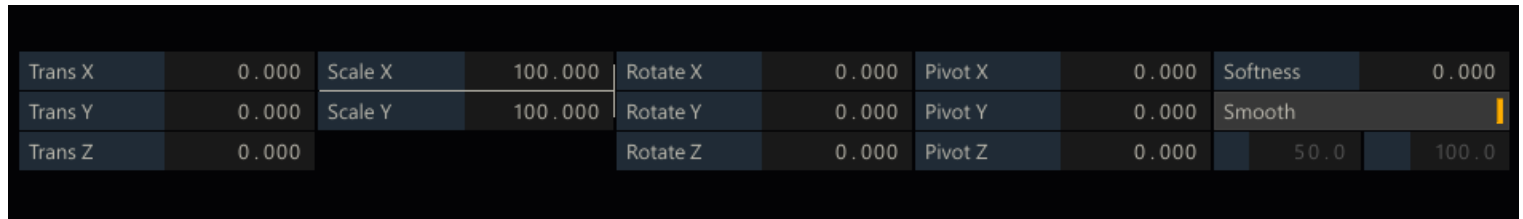
To unlock the Slates, you must drag from an empty area of the UI across the Link Bar.

Trans X	0.000	Scale X	100.000	Rotate X	0.000	Pivot X	0.000	Softness	0.000
Trans Y	0.000	Scale Y	100.000	Rotate Y	0.000	Pivot Y	0.000	Smooth	
Trans Z	0.000			Rotate Z	0.000	Pivot Z	0.000	50.0	100.0
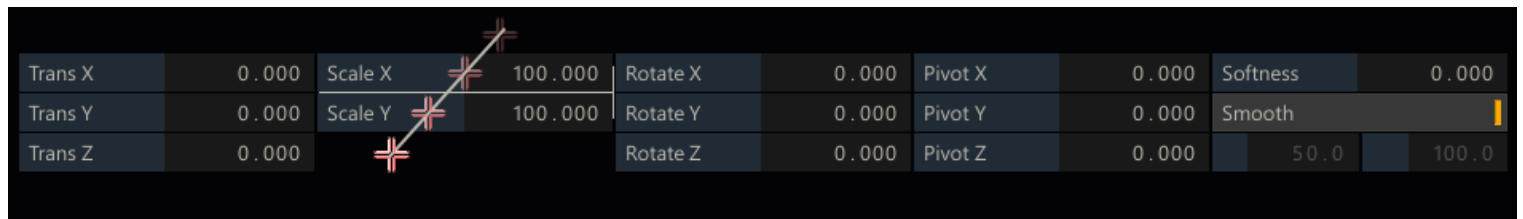
While you are dragging, a line is drawn to indicate that you are unlocking the Slates. Once the line crosses the white Link Bar, you can release the mouse or pen button. The Link Bar disappears and the Slates are unlocked. This can be done in any direction, but you must start dragging from an area of the UI that has no other interface elements on it. If the indicator line does not appear, then your start point was not valid.

Slates can be locked back together using the same method.

COLOR SELECTION PALETTES

There are several areas in SCRATCH where you will either need to sample a color from an image or designate a specific color. In these situations, the Color Selection Palette appears. This UI element allows you to designate a color in several ways.

RGB SLIDERS

The top row contains Sliders for Red, Green, and Blue levels. These can be adjusted by clicking inside the color area and dragging the indicator to the desired level. You can also use the Quick Key: Shift to modify the sensitivity of the sliders.

• Quick Key: Shift	» Modify slider sensitivity

Note: The sliders response is based on the settings for Control Gearing in the User Settings menu of the Startup Screen. By default, the Quick Key: Shift will increase the sensitivity of the sliders. However, if the values for Control Gearing have been altered, the sliders will behave in accordance with those settings.

CURRENT COLOR POT

In the center of the top row of the Color Selection Palette is the Current Color Pot. This area displays the currently selected color and has the values for each color channel superimposed over it. The values displayed are based on the Color Format that is selected. See below for more details about Color Format.

Color Picker

Whenever the Color Selection Palette is visible, you can select colors directly from the View Port. When the cursor is over the View Port, it changes to the Color Picker cursor.

Click down on any area in the View Port; the color beneath the cursor will be sampled. You can also hold down the mouse or pen button and continuously sample colors from the View Port. Releasing the mouse or pen button keeps the last sample as the current color.

Note: Pan and Zoom controls are deactivated while the Color Selection Palette is open.

COPY

To the right of the Current Color Pot is the Copy button, which copies the value from the Average Color Pot into the Current Color Pot.

AVERAGE COLOR POT

The Average Color Pot is a running average of all colors that have been sampled since the Color Selection Palette was opened. This can be useful for sampling black areas to get an average black level for a particular portion of an image, or for selecting a median value for a Qualifier. This is covered later in Chapter 8 – SCAFFOLDS. This color can easily be copied to the Current Color Pot using the Copy button.

SAMPLE

The sample button determines how many samples will be taken around a certain point when the Color Picker is used. This is another way of quickly averaging a selection. Using more samples from around the selected pixel reduces the effect of variations caused by film grain or color sub-sampling, and gives you a more representative value for a particular area of an image. If very precise pixel value measurements are required, a sample of 1 should be used to ensure that the values returned are exactly the values of the sampled pixel.

RESET

The Reset button returns the Color Selection Palette to its default, middle-gray color. It also resets the Average Color Pot.

HSV SLIDERS

Along the bottom of the Color Selection Palette are the Hue, Saturation and Value sliders. The current color can be modified by adjusting these sliders if you are more comfortable working in an HSV space as opposed to an RGB space. The Hue slider is larger than the others in order to provide more accurate selection.

COLOR FORMAT

To the right of the HSV sliders is the Color Format pull-down. This pull-down changes how color ranges are expressed within the Color Selection Palette. The actual bit depth is not changed; it simply alters the value ranges that are displayed in the Current Color Pot.

- 8-bit values range from 0 to 255

- 10-bit values range from 0 to 1023

- 16-bit values range from 0 to 65535

- 0.0-1.0 values range from 0.0 to 1.0

COLOR SPACE

This pull-down will change the color space that is used to display values in the Current Color Pot. The options are RGB, HSV, YUV and RGB-LOG.

NUMERIC

The Numeric button will toggle Numerical Slates on and off for RGB and HSV values so that you can enter these values directly in addition to using the sliders.

OK/CANCEL

On the left side of the Color Selection Palette are the OK and Cancel buttons.

To accept the current color selection, you must either press the OK button, use the Quick Key: Enter, or swipe the cursor off the left or right side of the screen.

• Quick Key: Enter	» Accept the current color selection.
• Swipe Action: Left or Right	» Accept the current color selection.

To cancel the current color selection and return to the previous selection, you must either press the Cancel button, use the Quick Key: Escape, or swipe the cursor off the top or bottom of the screen.

• Quick Key: Escape	» Cancel the current color selection.
• Swipe Action: Up or Down	» Cancel the current color selection.

SPECIAL PURPOSE INTERFACE ELEMENTS

There are many other interface elements in SCRATCH that are dedicated to a specific purpose; for example, the Tracker Ball interface in the COLOR toolset.
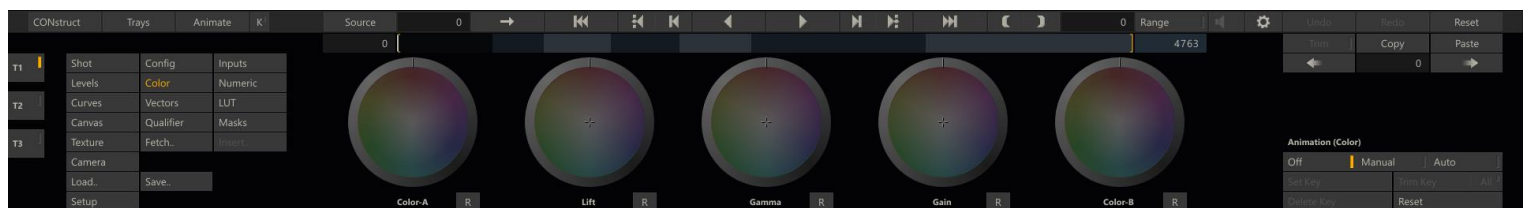
The specifics of these interface elements is described in their respective chapters.

DRAG MENU

In the Structure view - when dragging an element and hovering over another element - a circular menu will appear around the drop target with one or more drop actions.

You can either select one of the actions by clicking on it or click in the middle part on the drop target, which will trigger the default action. The default action is highlighted when hovering the middle part of the menu.

THE SCRATCH BROWSER

SCRATCH uses a custom File Browser for navigating the file system. This Browser provides specialized functions for working with image sequences and folders. The Browser will pop up over the View Port area whenever SCRATCH requires you to navigate to a particular file or folder.
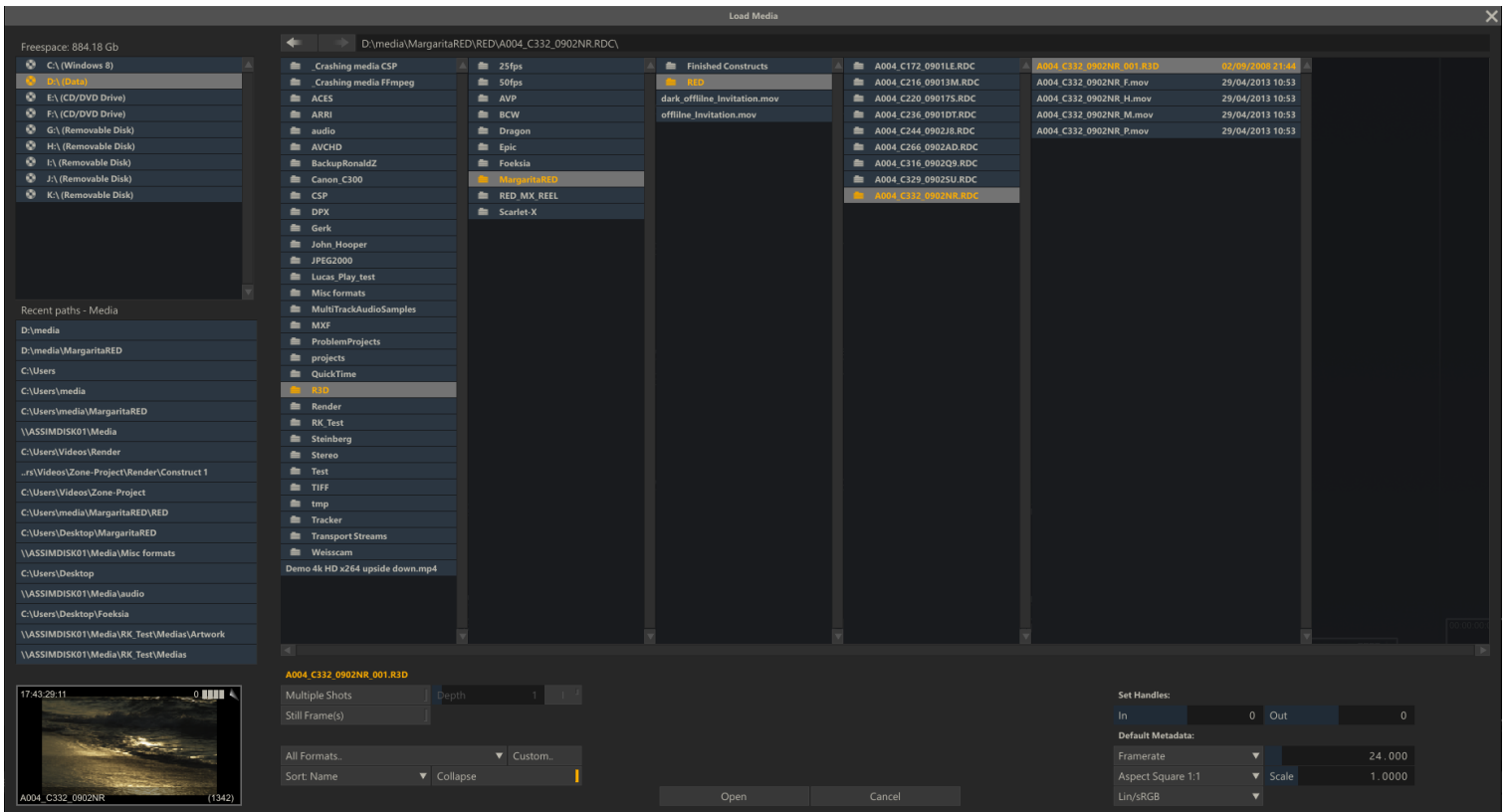
NAVIGATION

Each sub-folder is shown in its own column. Select a sub-folder to open the next column and show the folders/files contained within.

You can also use the following Quick Keys to navigate through folders:

- Quick Key: Up Arrow   » Select the next folder or file up in the current column

- Quick Key: Down Arrow   » Select the next folder or file down in the current column

- Quick Key: Right Arrow   » Expand the current sub-folder into the next column

- Quick Key: Left Arrow   » Close the current sub-folder and go back to the parent folder in the previous column

SCRATCH automatically detects image sequences and groups them into single entries within the Browser.
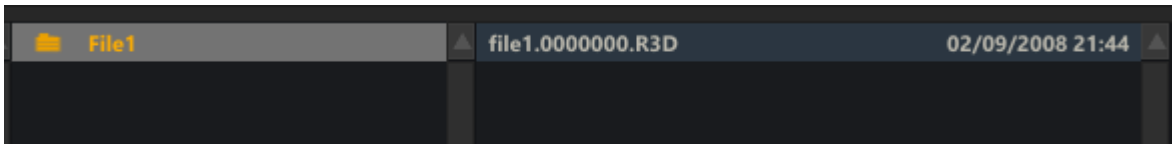
Each entry shows the base file name, number of frames in the sequence, and the date and time the files were created/modified.

RECENT PATHS

The left bottom list shows a number of recently used paths. Each time a file of directory is selected, the folder is added to the list. There are however different lists maintained, indicated by the label above the list. There are separate lists for different groups of file and folder types; image files, construct files, color and LUT files, plug-in and template files and lastly a general category.

FILE TYPE FILTER

The current folder can be filtered to only show files of a certain type.

SORT

The order in which files and folders are displayed can be controlled with the SORT button. The options for sort are By Date and By Type.
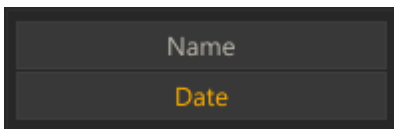
COLLAPSE

By default, SCRATCH groups image sequences into a single entry in the Browser. However, you can expand the group by de-selecting the COLLAPSE button. This shows each file on its own line in the Browser.
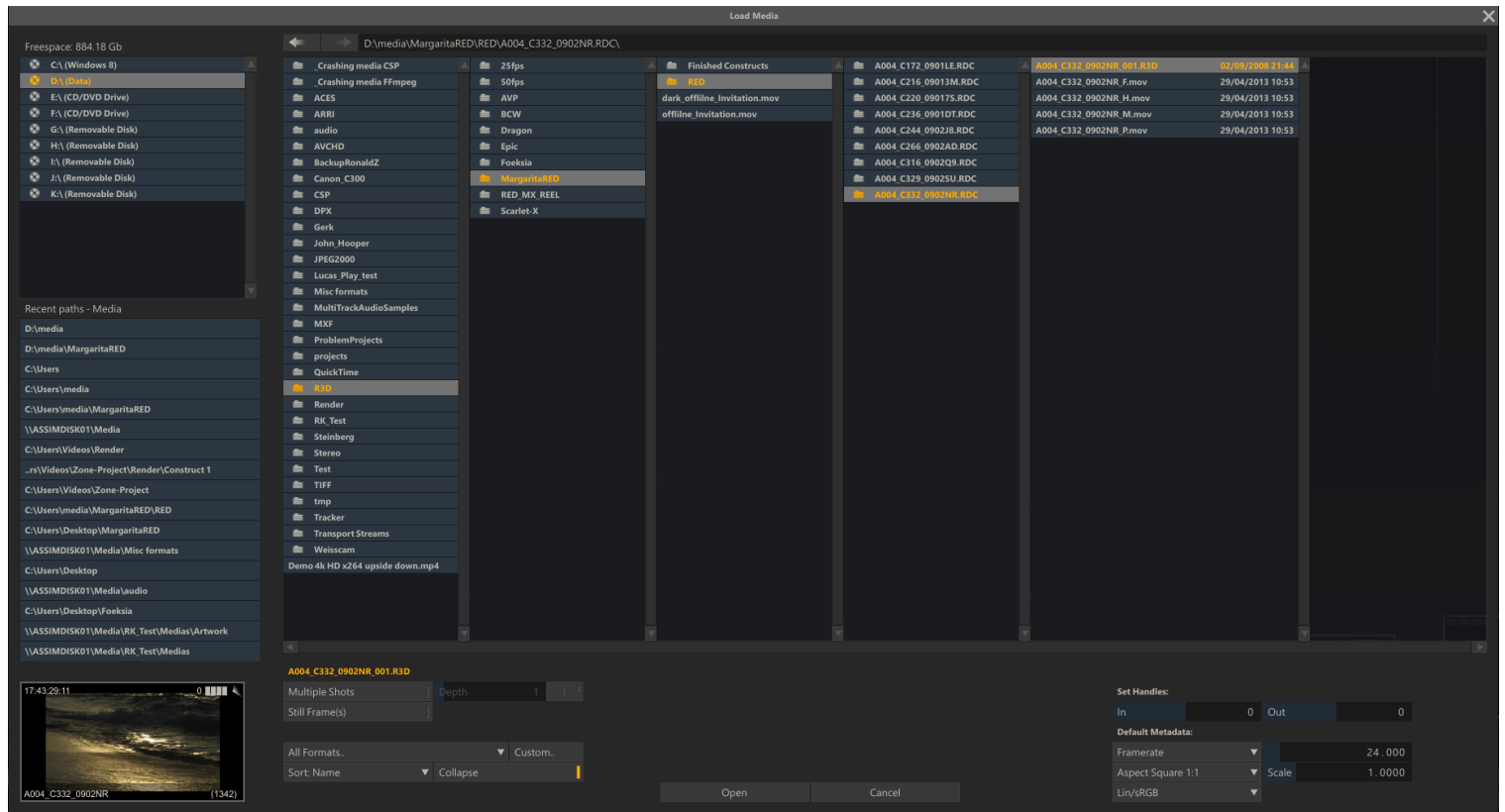
Tip: Sometimes you may receive multiple files that are not meant to be grouped together. For example, QuickTime files with names such as; Reference_1.mov, Reference_2.mov etc. These will get grouped together by the COLLAPSE function. To see each file, de-select the COLLAPSE button.

ERROR LOG

Pressing Quick Key: Ctrl + E anywhere from within SCRATCH, will popup the Error Log panel. Any irregularities that accured, e.g. unable to load a file, will be displayed. They will also be recorded in the general log. The Clear button will only remove items from the active list in the panel. The general log is not affected.
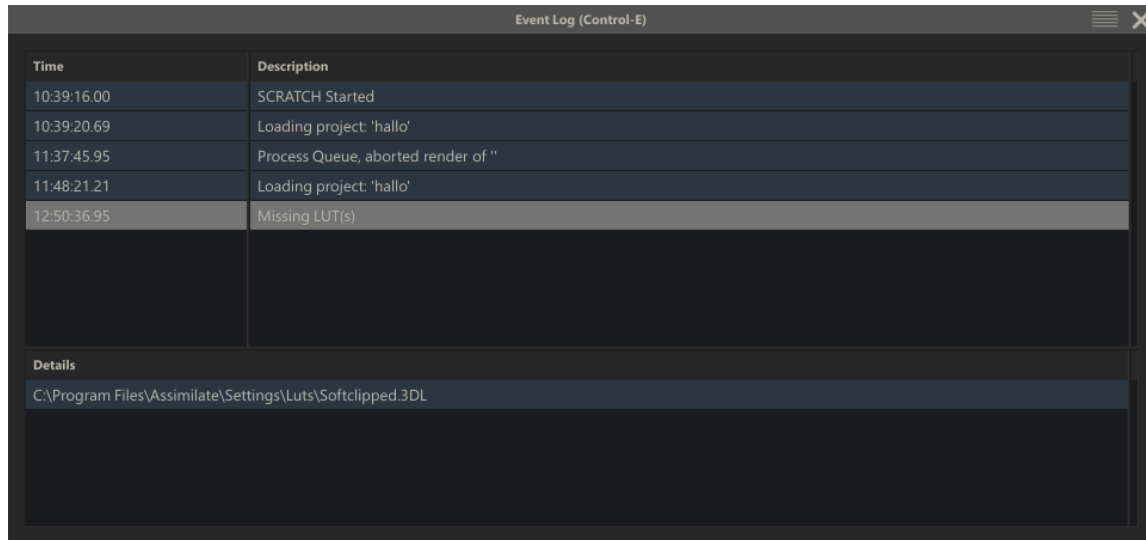
Quick Key: Ctrl + E	» Show Error Log panel.

QUICK KEYS

SCRATCH uses keyboard Quick Keys as shortcuts to many of the UI functions.
A list of these Quick Keys can be called up at any time from within the SCRATCH UI by pressing the Quick Key: H.

Quick Key: H	» Activate context-sensitive Help list.

This list is context-sensitive and shows only the Quick Keys that apply to that particular area of the software.
To clear the list, press the Quick Key: H again or swipe off any side of the screen.

Swipe Action: Any side	» Clear the context-sensitive Help list.

A complete list of all Quick Keys is available in Appendix A.

03 - The Startup Screen

01 - Introduction

GENERAL

This chapter introduces you to the Start-up Screen in detail, showing you how to configure Users, Projects, and SCRATCH Settings. When SCRATCH is launched, the Start-up Screen shows the Assimilate logo & product designation in the View Port area and by default the Session menu in the bottom Main Menu area.
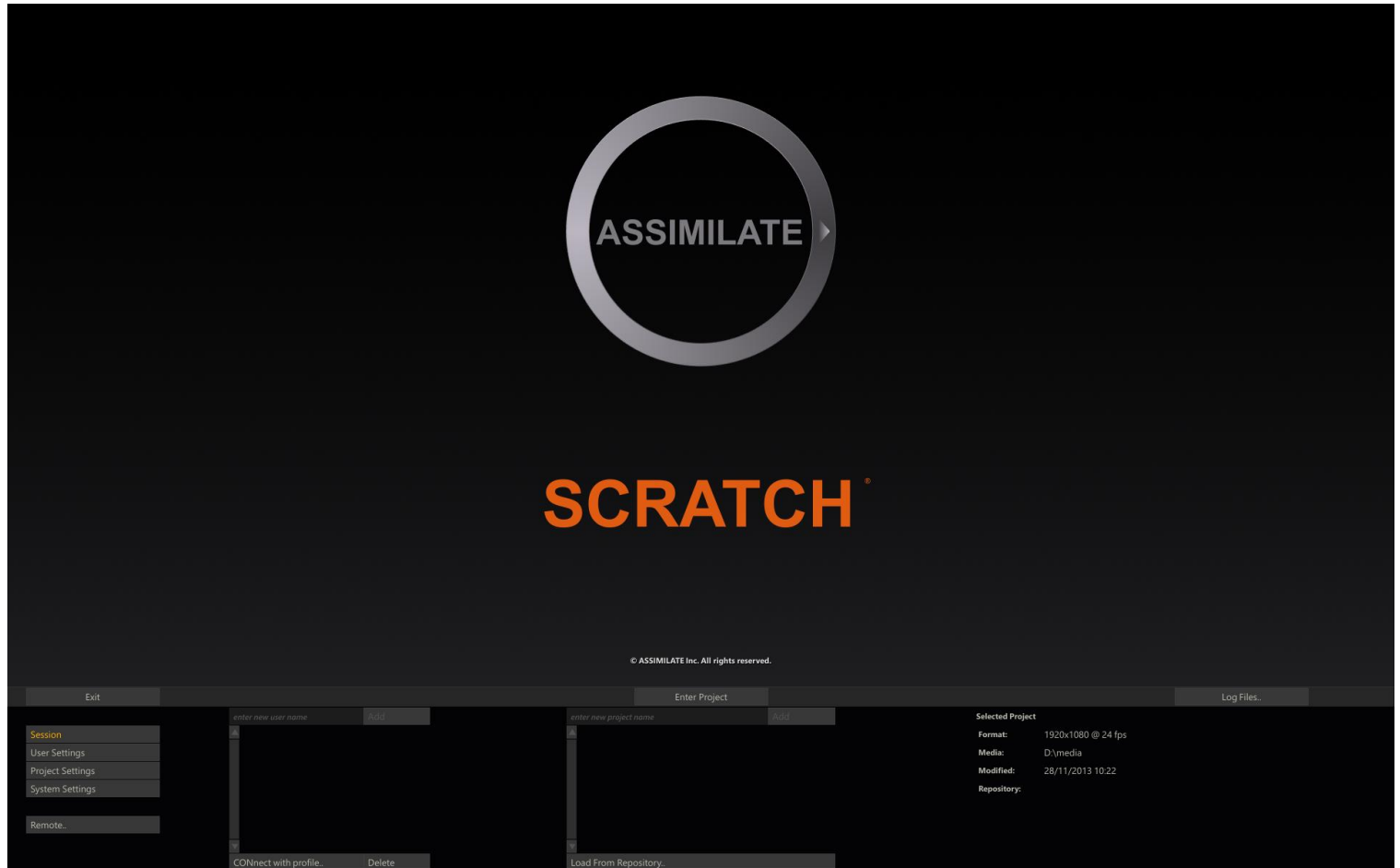
When the Start-up screen is inactive for 15 seconds or when you click in the View Port area, an overlay is displayed with system- and software version information. This info is also available in the log files maintained by SCRATCH but the overlay is more readily available. Next to system information - the ASSIMILATE News section might contain one of more links to on-line content: the links are displayed in blue and clicking them will open your default web browser.

If you click anywhere on the overlay it will be lifted, leaving the normal logo view again.

In the Main Menu area, the four buttons on the left side: Session, User Settings, Project Settings and System Settings switch the Main Menu between the different configuration menus. They are discussed in detail later in this chapter.

MENU BAR BUTTONS
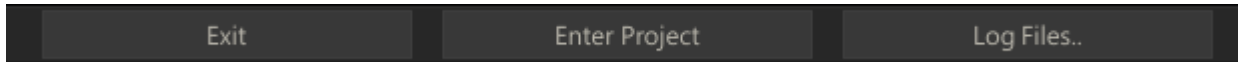
ACCESSING LOG FILES

The **Log Files** button, located on the right side of the Menu Bar, allows quick access to the SCRATCH log files. Clicking on this button opens a separate Windows Explorer to the location of the SCRATCH log files. You may occasionally be asked to send a log file to Technical Support or ASSIMILATE Licensing. This is a quick way to access the logs without having to browse to a specific location.

ENTERING A PROJECT

In the middle of the Menu Bar is the **Enter Project** button. This button is grayed out unless a User and Project are selected.

Clicking on the ENTER PROJECT button opens the selected Project, using the User's settings that you've selected. SCRATCH will keep the Project files locked when entering a project, preventing other other stations from opening the same project.

Note: If you attempt to open a Project that does not have a Media Directory defined, you will get an error message. Use the Project Settings Menu to define the Media Directory and then enter the Project.

If you upgraded SCRATCH you might be asked to upgrade any existing project before entering. In that case the **Enter Project** button will be grayed out and the **Upgrade Project** button will be active.
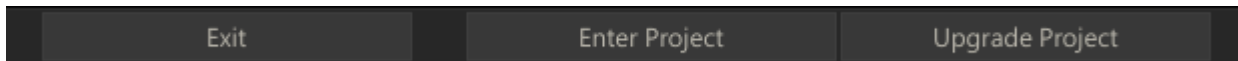
Make sure you always have created a backup of your projects before upgrading. After selecting the **Upgrade Project** button SCRATCH will convert the project database and the **Enter Project** button will become available.

EXIT

On the left side of the Menu Bar is the **Exit** button. The Start-up Screen is the only location from which you can access the **Exit** button. If you are already in a Project, you must first exit the Project and return to the Start-up Screen. Then you can exit SCRATCH. The **Exit** button requires a confirmation.

Note: The **Exit** button is only available when the User/Project Menu Button is selected on the left side of the Start-up Screen Main Menu. If any other Menu Button is active, the **Exit** button is grayed out.

02 - Session

GENERAL

In the Session Menu you select a User Profile, create and open Projects and can start a Remote session with other SCRATCH systems.
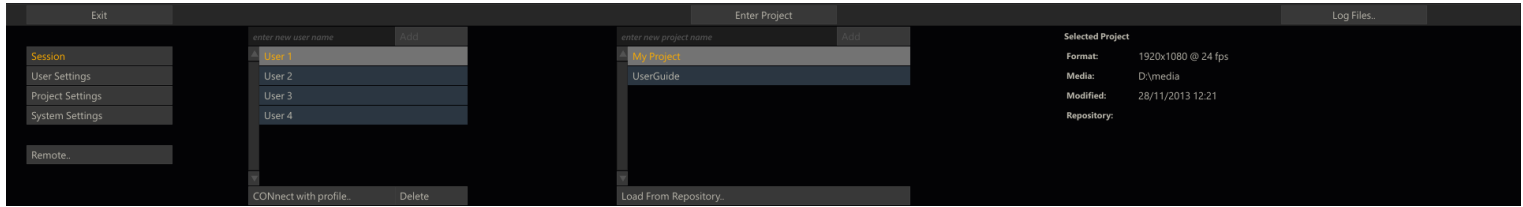
REMOTE SESSION

The option to start a remote creative session - where you can link multiple SCRATCH systems to interactively collaborate on the same project - is discussed in detail in Chapter 10 - Collaboration Tools.

USER PROFILE

A SCRATCH User Profile holds UI settings and preferences, customized panel settings and all galleries with grades and looks created by the user. A SCRATCH Profile can be linked to an online ASSIMILATE account to maintain all these settings online and have them available on any SCRATCH system.

The **Manage Profiles** button opens a dialog where you can create a new Profiles, switch between Profiles or synchronize the local Profile with the online account. For more information on linking and synchronizing a Profile to an ASSIMILATE account please see Chapter 10 - Collaboration tools.

DIALOG IMAGE

To create a new Profile you select the <Create New Profile> option in the Profiles dropdown and enter a new Profile name. Next you enter your ASSIMILATE account username (email) and password. The **Mem** button will remember the password for future use so you do not have to re-enter it. When you select the Create button, the new Profile is created and SCRATCH will start synchronizing the local profile with the ASSIMILATE account.

Note that you are not required to link a profile to an ASSIMILATE account. If you can leave the ASSIMILATE account username empty, the local Profile is still created. If you do enter the ASSIMILATE account username but leave the password empty SCRATCH will link the Profile but will not start a synchronization action.

To switch between existing Profiles, just select the profile in the dropdown and simply click the **Close** button to exit the dialog. The Session menu will now show the selected Profile.

PROJECT LIST

New Projects are created by entering a new name in the textslate next to the **Add** button. Project names have to be unique. If an already existing name or an invalid name is entered
the **Add** button is disabled. You can select an existing project from the list just by clicking it.

Tip: The list of SCRATCH projects can become long; to quickly navigate the list you can just type the (first characters of the) name of a project - the project-list will automatically scroll to that correct position and select the project. Subsequently using the Quick Key: Enter is equivalent to clicking the **Enter Project** button.

After adding a new project or selecting an existing project the info section on the right of the Project List will show some of the project properties: default resolution, media path, last modified. In certain cases the info section will display warning or message about the status of the project: e.g. if no or an invalid media path has been or when xml script for a project update is pending.

The **Load From Repository** and **Change Log** functions are discussed in detail in Chapter 10 - Collaboration Tools.

03 - User Settings

GENERAL

In the User Settings Menu you customize how the SCRATCH User Interface (UI) looks and acts. All settings are stored in the current selected User Profile.
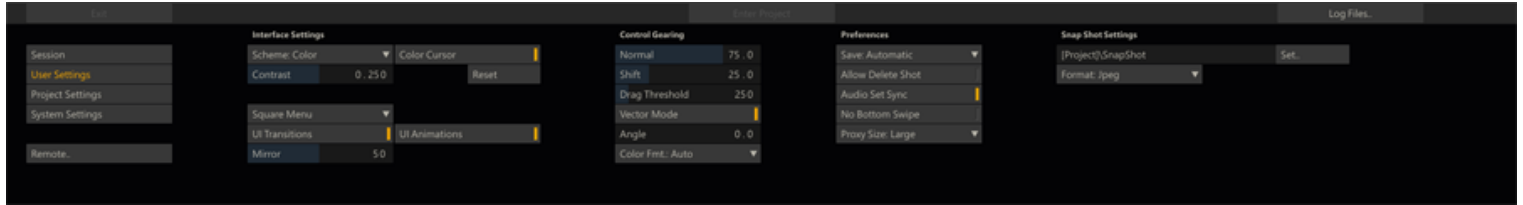
INTERFACE SETTINGS

CONTROLS

There are three options: ROUND, SQUARE and SHADED. The default style of ROUND gives the SCRATCH UI buttons rounded edges and a soft shade across them. The SQUARE style has sharper edges, a slight outline, and omits the shading. The SHADED style has the rounded borders with a more expressive shading across the buttons.

SCHEME

There are four options in the pull-down menu for Scheme:

- Color

- Mono

- Shaded

- Custom

These select the overall color scheme for the UI. Color applies the default color scheme for the UI. Mono changes the UI color scheme to a monochromatic style which creates less intrusion on the eyes while doing color work. Shaded is a alternative colored scheme provided by ASSIMILATE which is used as the default scheme in derivative SCRATCH producs. Color Custom allows you to customize the color of individual elements of the UI and modify the overall text size and font for the UI. This is covered in detail in Chapter 11 – CUSTOMIZING SCRATCH.

COLOR CURSOR

This toggle switches the cursor between the standard color style and a monochrome style. This is also useful for minimizing the intrusion on the eyes while doing color work.

Note: Warning and confirmation dialogs still appear in color. Also other specialized interface elements are not monochromatic since their color appearance is critical to their operation.

CONTRAST

When using a Custom color scheme, this numerical control adjusts the overall contrast of the UI.

RESET

This resets any changes made to a Custom color scheme back to the default values.

SQUARE/CIRCULAR MENU

These options control the appearance of the SCRATCH Command Menu. The Command Menu is a floating, pop-up menu that allows you to navigate between the various menus in the SCRATCH Player. See Chapter 5 – THE PLAYER for more details on the Command Menu.

UI TRANSITIONS

When switching between the three sections of SCRATCH -- the Start-up Screen, the CONstruct and the Player -- the interface cross-fades to the new section rather than just changing instantly. This makes the transition smoother on the eyes. Disabling this button turns off the fade effect and the interface switches instantaneously to the new section.

UI ANIMATIONS

This toggle activates the auto-panning mode for the CONstruct. When this is active, you can click, drag and release and the CONstruct will continue to pan as if it has momentum from the 'push' you've given it. The CONstruct continues to coast along until you click on the interface or until the beginning or end of the CONstruct is reached.

MIRROR

This set the amount of mirror effect on shots at the bottom of the slots in a CONstruct.

CONTROL GEARING

The next section of the User Menu determines how the Control Gearing behaves in Normal Mode and Shift Mode. These two values determine the sensitivity of the Control Gearing throughout the UI.

NORMAL

This sets the default increment for all Control Gearing. The value is expressed in terms of a relative percentage.

SHIFT

This sets the increment for any Control Gearing that is done with the Quick Key: Shift depressed.

Tip: If you want the Quick Key: Shift to actually decrease sensitivity rather than increase it, you can do so by inverting the two values. The Shift value should be less than the Normal value.

DRAG THRESHOLD

This is the time required to hold the mouse button down before a drag action is started as opposed to a regular click action.

VECTOR MODE

This specifies the orientation of the Tracker Balls in the COLOR MODULE.
Normally the order is:
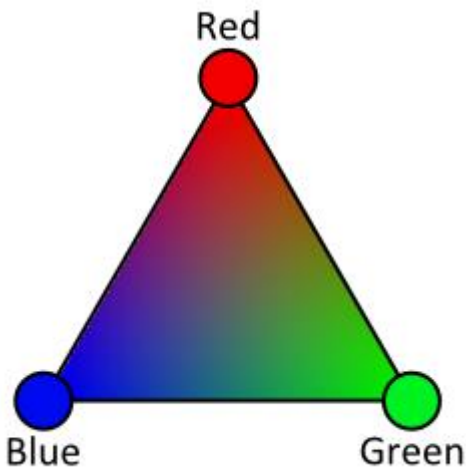
When Using Vector Mode, this becomes:
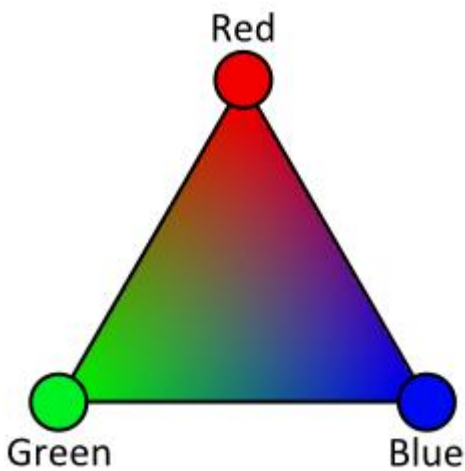
ANGLE

This control enables you to change the *angle* of the orientation of the Tracker Balls.

COLOR FORMAT

This pull-down changes how color ranges are expressed within SCRATCH. The actual bit depth is not changed; it simply alters the value ranges that are displayed within the interface.

- 8-bit values range from 0 to 255

- 10-bit values range from 0 to 1023

- 16-bit values range from 0 to 65535

- 0.0-1.0 values range from 0.0 to 1.0

PREFERENCES

SAVE

There are two options for saving: Automatic and Manual. When set to Automatic, SCRATCH automatically saves all changes made whenever navigating between different CONstructs, moving between a CONstruct and the Player (or vice versa) and when exiting a Project.

Both when set to Automatic or Manual, you can manually initiate a save at any time by using the Save All button or the Quick Key: Ctrl S .

• Quick Key: Ctrl + S   » Save current CONstruct

When set to Manual, SCRATCH will asks if changes should be saved or not when exiting a Project by displaying a dialog panel:
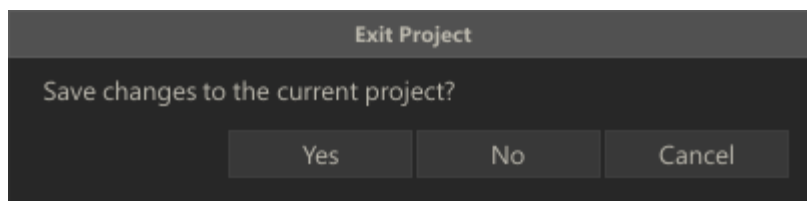
ALLOW DELETE SHOT

Normally, you cannot delete source media from within SCRATCH. The BIN MEDIA button in the CONstruct only bins (deletes) media that has been generated by SCRATCH, such as cache files. This is done as a precaution so that users can trust that no matter what, their original source media will remain intact.

However, there are some instances where being able to delete source media from within SCRATCH could be useful. Enabling ALLOW BIN SHOT replaces the normal BIN MEDIA button with BIN MEDIA & REF. This allows you to delete not only media that SCRATCH has created, but also the original reference (source) media.

Note: Because the ALLOW BIN SHOT option is so potentially destructive, it is not persistent between sessions. Once you exit from a Project, you must go to the User Settings Menu and enable ALLOW BIN SHOT again if you want to use it when entering another Project.

AUDIO SET SYNC

When playing back footage, SCRATCH automatically switches the Sync Mode of the Player to the most logical option, based on the system configuration. For example, if the NVIDIA SDI Option is present, the Player defaults to using VIDEO as the Sync Mode. There may be times where this automatic selection is not what is desired.

This option forces the Player's Sync Mode to Audio when you start playback, rather than automatically switching Sync Modes. This is useful for ensuring that playback always remains in sync with your audio. See Chapter 5 – THE PLAYER for more details on the Player's Sync Modes.

NO BOTTOM SWIPE

Enabling this setting will disable the cursor bottom swipe function which hides the menu panel and switches the shot being played to full screen mode. This way you can prevent any accidental resizing of the Player. You will still be able to switch to full screen mode by using the quick keys, and once in full screen mode the bottom swipe of the cursor will work to bring back the menu panel again.

PROXY SIZE

This setting determines the default size of the proxy images representing the source media in a project. The final proxy image size is related to the resolution of the footage, this settings only sets a base level; small, medium or large.

PLUGIN

This setting defines SCRATCH's behaviour when adding a plug-in to a shot. If it is set to Insert the original shot is kept and a copy with the plug-in applied is added below the original in the CONstruct. If set to Replace the shot with plug-in applied replaces the original shot. When the original shot is needed, it can be found in the Layer Stack.

SNAP SHOTS

SNAP SHOT DESTINATION DIRECTORY

This Text Slate determines where Snapshots are stored on the file system. By default, the path is set to the current Project's folder and a sub-folder called SnapShot . An absolute path can be specified using the SET button.

SNAP SHOT FORMAT

This chooses between JPEG and TIFF image formats for the resulting Snapshots.

04 - Project Settings

GENERAL

In the Project Setting Menu you can adjust the properties of the current selected Project. Note that many of the properties act as defaults. E.g. projects are not locked to a single resolution or frame rate; a single Project can contain multiple CONstructs / timelines with different resolutions and frame rates.
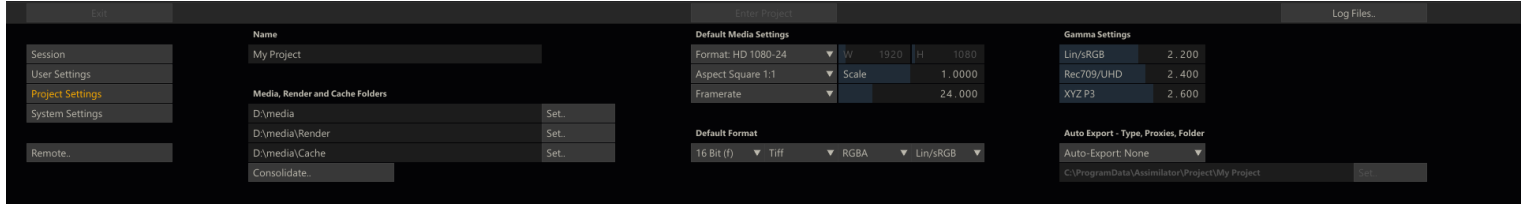
PROJECT PROPERTIES

PROJECT NAME

Click in this Text Slate to change the name of the currently selected Project. The change is reflected in the Project List in the Session menu and the actual Project folder is renamed.

Note: You must NOT have the Project folder open in any other application or Explorer / Finder window in order to change the name.

Tip: Be sure to press the ENTER key after changing this Text Slate or the change will not be accepted.

MEDIA DIRECTORY

The Media Directory Setting defines the root location that SCRATCH uses for resolving the path to source clips. Any clips loaded from a directory below this root has its location saved as a relative path from the Media Directory. This method allows you to easily change the location if the media gets moved to a different drive or sub-folder. After changing the Media Directory SCRATCH will continue to link to the source clips.

Note: You are not restricted to this Directory for loading clips! A clip may be loaded from anywhere. However, clips that are loaded from outside the Media Directory have their ABSOLUTE path saved. If this absolute path changes, SCRATCH is not able to link to those source clips automatically. As a result, it's a good practice to ensure that all media for a particular Project is contained below the Media Directory.

Use the SET button to browse for the Media Directory.

Note: The Media Directory must be set before a Project can be entered. If a Media Directory is not set, you will see an error saying **No MEDIA path configured...** when attempting to enter the Project. By default the media folder that was set for the projected created prior to the current is used - extended with the name of the current project.

RENDER DIRECTORY

The Render Directory Setting defines the root location for rendering output from the current project. You will be able to change any output path but the path here will be used as default root folder.

Note: The Render Directory is set by default to the ../render/ subfolder in the Media directory.

Tip: In many cases it might be more efficient to set the output to a different (physical drive) location than the media directory so read and write operations do not interfere.

CACHE DIRECTORY

The Cache Directory Setting defines the root location for rendering temporary output when working with the current project: e.g. processing effect plug-in output, media to be published.

Note: The Cache Directory is set by default to the ../cache/ subfolder in the Media directory.

CONSOLIDATE

This opens the project Consolidate dialog - discussed in detail later in this chapter.

Note: Because the Consolidate function has potentially far reaching consequences for projects and stored media, you can hide this option from the menu setting the Disable Consolidate option in the Advanced System Preferences (explained in the next paragraph).

FORMAT

Format defines the default resolution, frame rate and aspect ratio for each new CONstruct that is created in the Project. Clicking on the FORMAT button opens a pull-down menu with preset formats. Choose any of these formats and the resolution, frame rate, and aspect ratio information is automatically updated.

There is also a CUSTOM format that allows you to define each parameter independently. Once CUSTOM is selected, the Width and Height Numerical Slates will be active.

Note: The maximum size for a CONstruct is 65535 pixels by 65535 pixels and the minimum size is 32 pixels by 32 pixels.

Tip: You can define your own custom image formats that appear in the pull-down menu by editing the ImageFormats.cfg file. See Chapter 11 – CUSTOMIZING SCRATCH for more information.

ASPECT

The Aspect Ratio is defined in SCRATCH with two controls: Aspect and Scale.

Aspect defines the overall relationship of height to width in the image, while Scale defines the aspect ratio of each pixel within the image.

Certain formats such as NTSC and PAL do not have square pixels. They are actually rectangular. This difference must be taken into account so that images are presented without distortion on the screen.

Clicking on the ASPECT button opens a pull-down menu with preset aspect ratios that can be selected. These presets automatically set the SCALE value accordingly.

There is also a CUSTOM aspect allows you to set the pixel ratio manually.

Note: The Aspect Ratio (and thereby the Scale) are set as part of the FORMAT presets. Changing the FORMAT automatically changes the Aspect to the setting that is linked to that particular format. You can manually change the Scale afterward by selecting the CUSTOM Aspect from the pull-down and entering a new value into the Scale Numerical Slate.

Tip: You can define your own custom aspect ratios that will appear in the pull-down menu by editing the Aspects.cfg file. See Chapter 11 – CUSTOMIZING SCRATCH for more information.

FRAMERATE

The default frame rate for the Project can be set in two ways.

You can click on the FRAMERATE button for a pull-down menu with standard frame rate options from 23.976 to 60. Or, you can enter a frame rate using the adjacent Numerical Slate.

Note: The frame rate of the Project controls what values will be assigned to information such as Timecode, and how EDLs will be interpreted. It is important that this value be set correctly before any import or conform operations are performed.

DEFAULT FORMAT

Here you select the default bit-depth, file format, color channel setup and color space for each output that you create in the Project. Just as resolution and framerate, the default value can be changed at any time.

PROJECT GAMMA

SCRATCH supports a number of standard Color Spaces: Linear/sRGB, Log/Film, Rec709, Ultra HD (Rec2020), CIE XYZ P3, ACES, Wide Gamut, Scene Linear. Each of these Color Spaces have an associated gamma value / curve that is used when converting from or into that color space. In this section you can adjust the value used for some of these color spaces.

AUTO-EXPORT OPTIONS

When setting the Auto-Export option, SCRATCH will on every project exit or refresh export project-data from the project database to an external file which can be used by third party applications. In case the export is set to HTML, SCRATCH will ask before doing the export as this might potentially be a lengthy procedure. The exported data contains information about all aspects of the Project and can be used by third party systems, programs or scripts to determine and use the state of a Project, even if SCRATCH is not running.

Project-data can either be exported as XML or HTM. To generate HTML SCRATCH generates XML first and uses that in a (customizable) XSL transformation. In this process, SCRATCH will also create a proxy image-file for each shot in the project. When selecting HTML as export format, two additional options become available. The Overwrite option is enabled by default, meaning that on every export the proxy image of every shot is re-created. Disabling the option will only create an image proxy when no image-file for the shot is present yet in the designated location. This will speed-up the export process but does not ensure that the image is the most recent available. The second option available for the HTML export is to create a LUT per shot in the project. This LUT can be used in third-party systems. The LUT can either be 1D or 3D. The 3D LUT has by default size 32 and depth 16. The creation of the LUT is also linked to the Overwrite option.

When enabling Auto-Export the export is placed in the directory specified in the Text Slate. Use the **Set** button to browse for the Export Directory. For more information about the XML / HTML output and SCRATCH XML in general, refer to Appendix C of this guide.

CONSOLIDATE

The Project Consolidate function allows you to move all used physical media to a new media folder and / or to just move any media external to the media folder into the project's media folder.
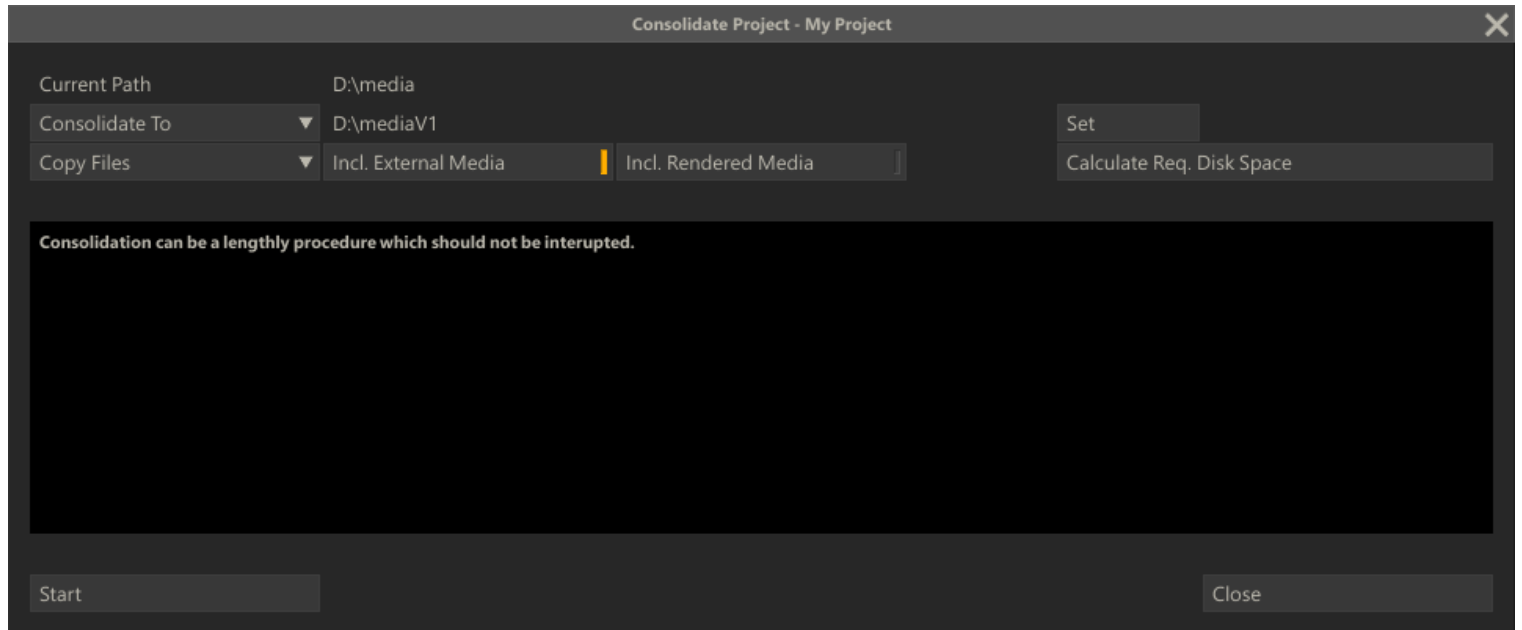
CURRENT PATH

At the top of the dialog the current Project Media path is displayed

CONSOLIDATE TYPE

There are two types of consolidation:

Consolidate To

With this option a new Project Media folder is created and all media used in the project is moved to the new folder.

Make Local

This option scans all the media used in the project and moves all items that are stored outside the Projects Media folder into that folder.

COPY / MOVE

The consolidate can either make a copy of each consolidated media file or just move the file to the consolidate folder. Moving files will in general be much faster, however only possible when source and destination are on the same logical drive - if not, SCRATCH will automatically make a copy even if the Move option is selected.

INCL. EXTERNAL MEDIA

This option is only available with the **Consolidate To** type of consolidate. Enabling this option will also move any media outside the current media folder to the new media folder. Without this option any external media is not included in the consolidate. When moving external media into the media folder the full-path is used within the media path: e:\external\media\shot.mov will move to d:\new_media_path\external\media\shot.mov.

INCL. RENDERED MEDIA

This option is only available with the **Consolidate To** type of consolidate. Enabling this option will also move any rendered media to the new media folder. Disabling this option will exclude any rendered media; all output-nodes in the project will lose their reference to the rendered media and need to be processed again.

CALCULATE REQUIRED DISK SPACE

This button will calculate and show the required disk space, given the consolidate type and selected options, and the free disk space available; either of the disk of the new media folder or that of the current folder if the Make Local option is selected. This check is *always* performed before starting a consolidate. If SCRATCH detects that the target disk does not have enough disk space available, the consolidate will not start.

EXECUTING THE CONSOLIDATE

The Start button will begin the Consolidate process. About the Consolidate process:

- The first step is confirming that there is enough disk space to execute the consolidate. If SCRATCH detects insufficient disk space, the consolidate will not proceed.

- Next to writing begin and end of the consolidate to the regular SCRATCH logs, a special consolidate.log file is created and written in the Project folder of the current project. This log lists every step of the process. The log file is never overwritten and maintains older consolidate listings unless manually removed.

- The Consolidate copies / move all media of a shot and not just the part used inside SCRATCH; always the full sequence / all the file segments.

- The Consolidate process uses SCRATCH's own sequential copy method that ensures edits are optimized for real-time playback.

- The Consolidate process also includes audio files.

- The dialog calculates and displays the time remaining for the process to finish. This estimate is updated after each file move/copy.

INTERRUPTING THE CONSOLIDATE

A Consolidate process can be a very lengthy procedure which preferably should *not* be interrupted. It is possible though to pause the process by clicking the **Stop** button; the process will finish the current copy/move action. After pausing the process you can exit the Consolidate dialog but you will however *not* be able to enter the project that is being consolidated. Other projects are normally accessible.
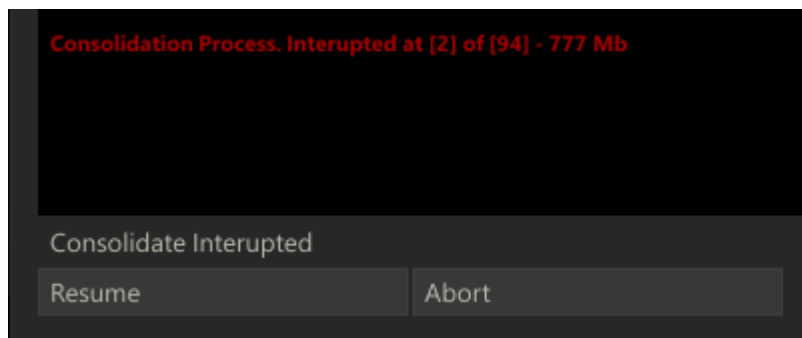
A Consolidate that was paused can be resumed at any time, even after exiting SCRATCH and starting it up again; the **Resume** button will start the process where it left off. To completely abort a consolidate process, press the **Abort** button:

- SCRATCH will ask a confirmation to abort the consolidate as in potential might result into losing media references. In addition SCRATCH will ask whether to finish the consolidation for the current shot as to further minimize the change of losing media references.

- Only after fully finishing the consolidate-process the project's media folder setting is updated. Aborting a consolidate process will leave the old media folder referenced. When using the *Move* option rather than the *Copy* option, will make all the media processed til the abort external. If *Copy* was used, the copied media will not be referenced. This only applies to non-external media.

CLOSE

After finishing the consolidate the Close button will close the dialog and return to the Project settings menu.

CONSOLIDATING PARTS OF A PROJECT

The Consolidate process is always performed on the complete project. To consolidate only part of a project (e.g. a single CONstruct) you have to export the CONstruct and import this into a new Project and consolidate the new project.

05 - System Settings

GENERAL

The System Settings Menu defines system-wide paths and other configuration information that is used by SCRATCH.
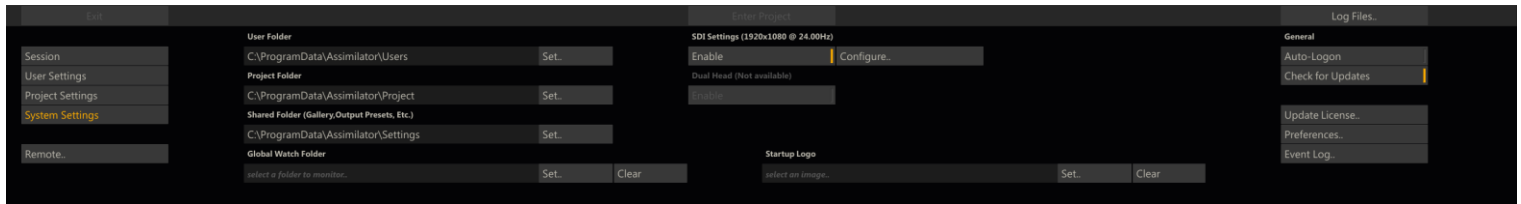
SYSTEM FOLDERS

SCRATCH stores all Project databases, User Profiles and created templates and presets in separated folder. You can change this configuration to suit your particular setup. E.g. you can point for the location of these folders to a network shared directory to share projects and user profiles with multiple SCRATCH systems. Note though to share projects the network protocol used should enforce proper file locking otherwise two systems might end up adjusting the same project database, resulting in database corruption and loss of data. Also, SCRATCH does not lock the files in the Users folder when a User Profile is selected. Strict procedures for all users to only select a single User Profile from one system at any one time is recommended.

PROJECT DIRECTORY

Location where SCRATCH stores all projects - one sub-folder per project. Use the **Set** button to open a SCRATCH Browser and navigate to the desired folder.

USER DIRECTORY

Location where SCRATCH stores all User Profiles - one sub-folder per profile.

SHARED DIRECTORY

Location where you can store various templates and presets to be shared between all User Profiles on a single system, or amongst multiple SCRATCH systems when located on a network drive.

GLOBAL WATCH DIRECTORY

The Global Watch Directory works in conjunction with the SCRATCH XML-script capabilities.

While SCRATCH is running, it is constantly monitoring – or watching – this folder for new files. If a new file with an .xml extension is copied into this folder, SCRATCH opens the file and attempts to process the XML commands that are contained within. To warrant consistency in processing if multiplied files are inserted in the Watch Folder - files are processed in order of their modified-date. The use of XML-script in SCRATCH is covered in more detail in Chapter 10 and Appendix C.

Use the **Clear** button can be used to remove the Watch folder completely.

SDI AND DUAL HEAD SETTINGS

ENABLE AND CONFIGURE

SCRATCH will automatically detect and can use a second monitor or SDI output. This second output will not have the user interface overlaid on it and can be used as a clean feed for projection, client monitoring or output to atape deck. SCRATCH currently automatically detects and supports the following SDI boards: AJA (KONA 3, 3G or LHi), Bluefish cards, DeckLink, NVIDIA SDI Option card. When one of these cards is detected you can enable SDI with the corresponding **Enable** button and the **Configure** button becomes available which in turn opens the SDI settings dialog window. The SDI configuration panel is discussed in more detail later in this paragraph.

Note: Some of the supported SDI cards require SCRATCH to restart after an Enable or Disable. On Windows SCRATCH will restart automatically, on OS X you need to manually restart the application.

DUAL HEAD

Enable or disable the second monitor if available. This option is on by default if SCRATCH detects a second monitor. However, if SDI is enabled this option is no longer available.

OTHER SYSTEM SETTINGS

STARTUP LOGO

Here you can select an image file with e.g. your company logo to replace the SCRATCH Logo on the Start screen. Use the **Clear** button to remove a previous selected image and revert to the normal SCRATCH logo.

AUTO-LOGON

With Auto-Logon enabled, the initial Startup Screen is bypassed and SCRATCH enters automatically to the last Project that was used in your previous SCRATCH session.

Tip: To enable the Start-up Screen again, exit a Project and switch to the System Settings Menu; deactivate Auto-Logon. The next time you start SCRATCH you will be presented with the Start-up Screen.

UPDATE LICENSE

This opens the License activation dialog for entering and (re)activating a license key to enable the SCRATCH software. See Chapter 2 - Getting Started, Licensing the Software for more information on license key activation.

PREFERENCES

This opens a new dialog with advanced configuration and customization options. Details on this dialog are discussed in Chapter 10 - Utilities and Customization.

SDI AND DUAL HEAD SETTINGS

This dialog panel let's you configure a number of your SDI Settings.
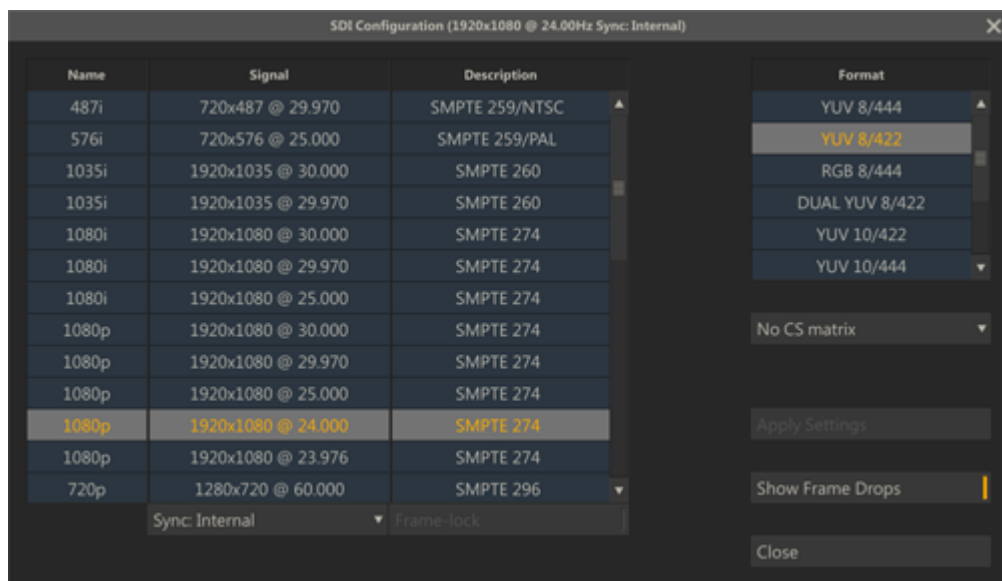
SIGNAL FORMAT

Select the resolution and framerate of the signal. Note that this will override any signal selected in the NVIDIA control panel.

DATA FORMAT

This is either RGB or YUV in various SDI specific layouts.

- Note that any 444 format requires a dual-link.
- For 444 the AJA implementation only supports RGB formats.
- When selecting RGB 444 with an AJA card the SDI signal is always full-range and no colorspace matrix can be applied.

COLOR SPACE MATRIX

- SCRATCH always produces RGB values which need to be converted to SDI
- The conversion will be performed to either CCIR, REC709 or RGB

- **Scaled** means SCRATCH will scale it's RGB values to fit into the *Legal* SDI range

- **Full** means SCRATCH will not scale the levels but transfer them 1:1 to the SDI colorspace

The additional **H** (Headroom) option enables or disables the availability of super black/white on the SDI output signal. Note that **Scaled** already is in a legal range and can not produce super black/white levels.

SYNC AND FRAME LOCK

For NVIDIA cards only - you can either select to use the internal sync of the card or to work with an external sync device.The Frame-lock can be used to sync across multiple monitors. Please see the NVIDIA documentation for more details on these functions.

SHOW FRAMES DROP

Enabling this option will show an error message in the player each time a frame was dropped on the SDI signal.

APPLY SETTINGS

When using an NVIDIA SDI card SCRATCH will automatically restart after **Applying** new settings to re-initialize the SDI card. This is not required for the other supported cards.

Note: when using an NVIDIA card a warning may be displayed at the bottom of the panel indicating that the selected signal and any external sync do not correspond. This is an internal NVIDIA driver message.

Note: With the "NO CS matrix" option set, SCRATCH will not explicitly set the color space at start up. In that case, the color space that has been set through the NVIDIA settings panel will be used. However, after selecting "NO CS matrix", you should first exit SCRATCH and (re)set the custom color space through the NVIDIA panel.

Note: The SDI Output only shows images from the Player. When you are in the CONstruct or the Startup Screen, the SDI Output shows a SCRATCH logo screen or a custom logo if the Startup Screen has been customized. See Chapter 10 for details about customizing the Startup Screen.

Tip: The[DUAL YUV 422] option is used for stereoscopic output. The two outputs of the NVIDIA SDI card will be configured to show the left and right sides of the SCRATCH DUAL VIEW. Details on configuring SCRATCH for stereoscopic projects are covered in a separate support article.

04 - The CONstruct

01 - Introduction

GENERAL

After you select **Enter Project** from the Start-up Screen, you will be presented with the **CONstruct-module**, which provides the main data-management interface for your Project. This is where you perform the larger tasks of loading material into the system, grouping clips into a logical order - either manually or through one of the supported **Edit List** formats - and preparing the media for further manipulation.

The CONstruct is the heart of this. A CONstruct has multiple dimensions each of which serves a different purpose.
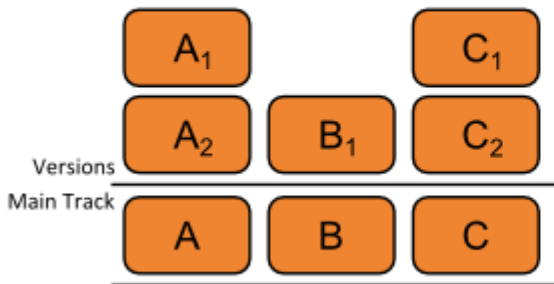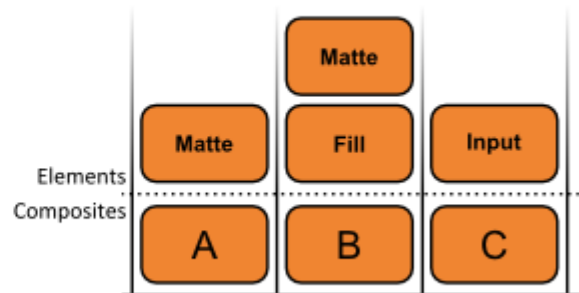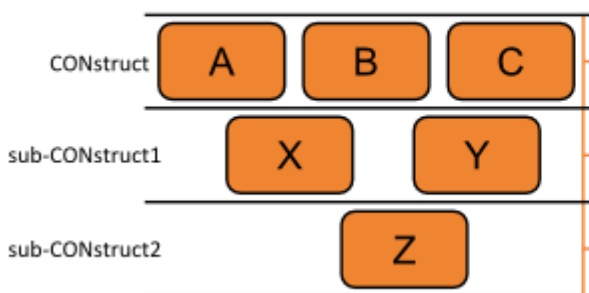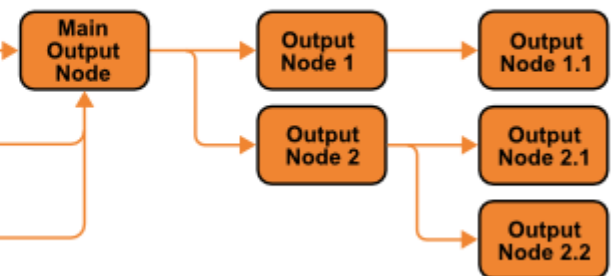
- Timeline - a CONstruct is made up of Slots. Each Slot can contain one or more Shots stacked on top of each other (usually versions of the same Shot). All the Shots at the bottom layer of the Slots together make up the Timeline.

- Staging - all (composite)shots have their own holding area for managing the elements of the composite (inputs, fills, mattes) and storing alternative versions of those elements.

- Tracks - sub-CONstructs serve as Tracks in a multi-layered timeline setup. Each sub-CONstruct is added as a additional Layer on the Main Output of the Main CONstruct. Each sub-CONstruct still has its own versioning, staging and output dimensions available.

- Outputs - with each CONstruct you can create multiple output nodes to render out the timeline in different formats simultaneously.

A Project can contain multiple CONstructs organized into Groups. A new project starts with a single empty CONstruct.

This chapter discusses the various elements of the CONstruct module.

- **Project Tree** - to create and organize CONstructs, sub-CONstructs and Groups.

- **Slots** - a CONstruct is build up of Slots. A Slot can contain multiple Shots, stacked up on top of each other. A Slot also represents the transitions / edits in your Timeline.

- **Shots** - represent (sequences of) images on disk and are displayed as proxies, which you can move, copy or otherwise manipulate.

- **Staging** - the holding area per shot for (versions of) elements used in a composite - fills, mattes, stills, etc.

- **Metadata Stack** - show and edit all the metadata available with a Shot.

- **Layer Stack** - displays a hierarchical tree of the elements of a composite shot, offering quick insight into the build-up of a shot. Also a means of navigation and direct way of manipulating – replacing or removing – elements. The Layer stack is also available in the Player module and is discussed in more detail in Chapter 5 - The Player.

- **Output** - A CONstruct has always one Main output node but can contain a tree of derived output nodes, making up an Output Pipline witch each node having another node as its input and the Main Output having the Construct Timeline as its input.

- **Trays** - the trays provide a project wide available holding area for (temporarily) grouping of shots for various purposes (e.g. a collection of shots to be graded simultaneously). The Trays also provide a holding area to store Looks and Composite that transcend the project and are available with all projects on a system.

- **Media Browser** - interface to browse and manipulate all the clips in your project using a text-grid.

- **Process Queue** - manage and view the progress of renders of Output.

- **Search Dialog** - popup panel to search the project database for certain Shots based on specific meta data properties.

- **Configuration Settings Dialog** - popup panel with user-settings regarding CONstruct and Player layout and behavior.

02 - Project Tree

GENERAL

A Project can contain multiple CONstructs and these CONstructs can be organized into Groups. A CONstruct in turn can have one or more sub-CONstructs, acting as Tracks in a multi-layered timeline setup. The Groups, CONstructs and Tracks are shown in the panel on the left side of the Viewport which you can open and close by a swipe action with the mouse or pen.

• Swipe Action: Left   » Show/hide the Project Tree

Each new Project begins with a single CONstruct in a single Group. As new CONstructs are added, they appear in the tree.
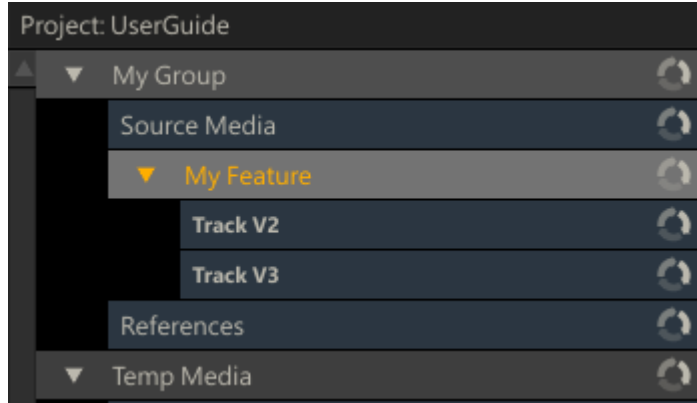
With the controls at the bottom of the Project Tree panel you can manipulate the elements.
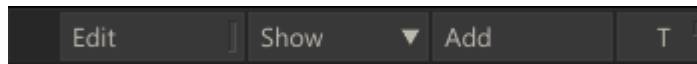
- The **Add** button will create a new CONstruct in the currently selected group. When the **T** button is enabled, the new CONstruct will be a sub-CONstruct of the current CONstruct and act as a Track in the multi-layered timeline setup. In Chapter 5 - The Player, Tracks are discussed in more detail.

- With the **Show** button you can toggle the appearance of all the Project Tree items to one of three states: Collapse, show Shots (proxies), show Note. See below for a more elaborate explanation of these states.

- By clicking on the **Edit** button an additional row of controls appears and the Project Tree switches into edit mode.
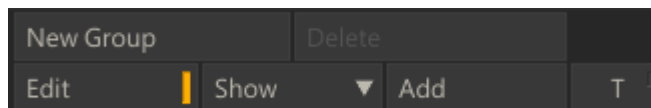
With the Project Tree in Edit mode you can:

- Create additional groups with the **New Group** button

- Change the names of the Project Tree items by clicking on them

- Mark an item for deletion by clicking on the Delete icon next to the item. This will change the icon to a red cross. To remove the marked items permanently you click the **Delete** button.

Changing the order of CONstruct within a Group, the order of Groups or moving a CONstruct from one Group to another is done by dragging and dropping the item. You start a drag action by clicking on the item and holding the left mouse button down for a short moment. The item will then be attached to the cursor and you will be able to drag it across the Project List (you can release the mouse button). A white line will appear indicating the new position of the item if you would click again.
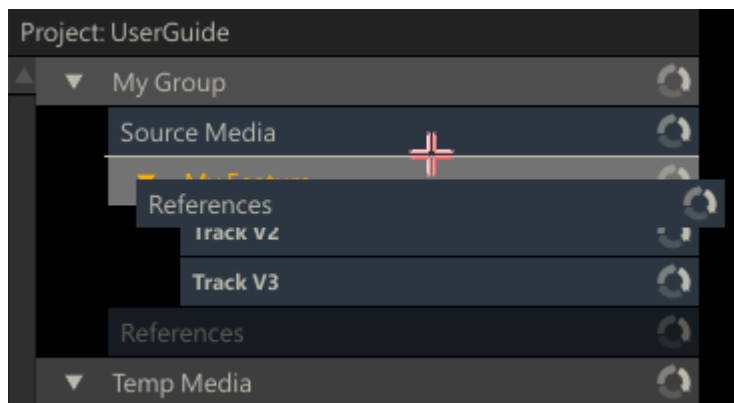
When holding the Alt key down when starting a drag action, rather than picking the item up to be moved, a copy is made of the CONstruct or Group. The copy can now be dropped anywhere within the Project List the same way as you would when moving an item. You can remove the copy before placing it by swiping down or by pressing the escape key.

• Quick Key: Hold down left mouse key momentarily	» Start drag action Project List item
• Quick Key: Alt + hold down left mouse key	» Copy Project List item and start drag action
• Swipe Action: Down	» Clear Project Tree item from the mouse pointer

When dragging a CONstruct item and hovering over the right section of another CONstruct item, a white border will appear fully surrounding the item hovered over. This means that dropping the item at that position will turn it into a sub-CONstruct, i.e. create a Track.
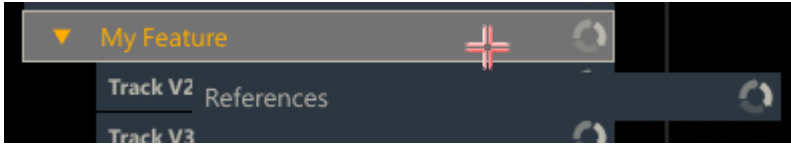
When hovering over a position that does not allow a drop - like dropping an item onto itself - the drop-position-line will appear red.

You can toggle the state of an individual Project List item by clicking on the cycle icon in the right corner of the item. Alternatively, you can also use the Show button at the bottom of the Project List to toggle the state of all items at once.

- *Collapse:* Default state of a CONstruct item showing merely it's title.

- *Shot Proxy:* Shows the proxy image of the first clip on the active slot of CONstructs.

- *Note:* This shows an annotation below the item you can edit. When there is text present, the cycle icon will be colored the same color of the note. For more on **sticky notes**, see the corresponding paragraph in the section about shots, later in this chapter.

- You can also collapse or expand a Group item or a CONstruct item with sub-CONstructs by clicking on the arrow icon on the left of the item.
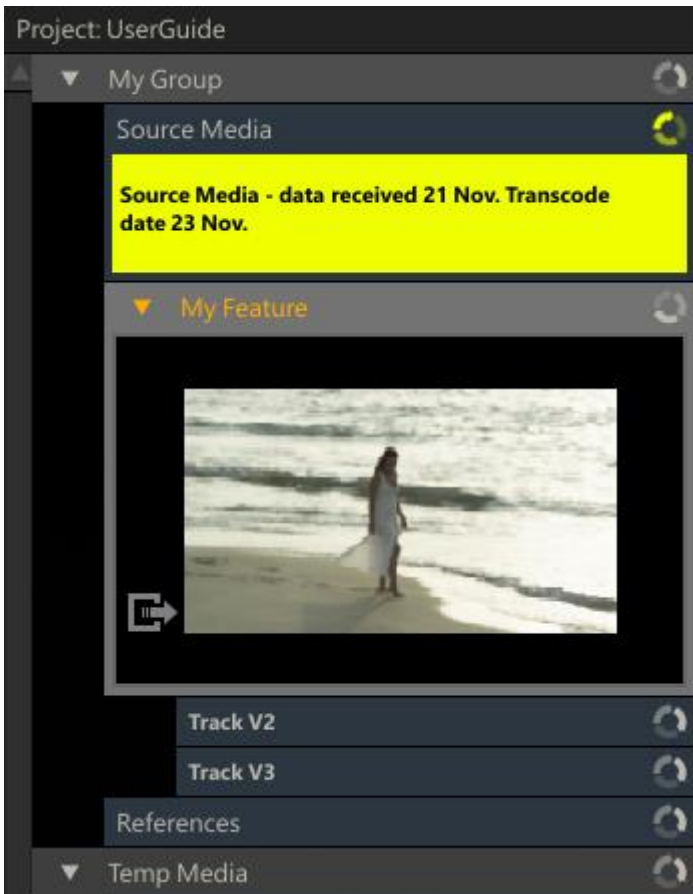
If the Project List becomes too long to fit on the screen you can use the scroll bar at the left of the Project List to scroll up and down.

45

03 - Managing Slots

GENERAL

A CONstruct represents a timeline which is divided in Slots. A Slot can hold one or more shots - stacking up vertically. Only the bottom shot is included in the timeline - all other shots in a Slot are considered versions. The length of a Slot within a timeline defaults to the length of the bottom shot - but can be set independent. All transitions in a timeline between one shot to the next are Slot properties.

The number of Slots as well as the number of clips within as Slot can quickly amount to a number that will not fit on a single screen. The following Quick Keys are available for navigating the CONstruct and slots:

- **Quick Key:** Drag horizontal   » Pan across the CONstruct horizontally
- **Quick Key:** Drag vertically inside a slot   » Pan across the Slot vertically
- **Quick Key:** Right Arrow   » Reveal one slot to the right in the CONstruct
- **Quick Key:** Left Arrow   » Reveal one slot to the left in the CONstruct

When in panning mode, the cursor will change to ✛ . Besides using the quick keys you can also use the scroll bar below the Transporter Controls to scroll through the CONstruct. Note that a Slot is only scrollable when enough shots are added to the Slot.

SLOT INFORMATION AREA

Below each Slot in the CONstruct is the Slot Information Area. This area is used to display a variety of information about the Slot and/or the current Timeline Shot within that slot.
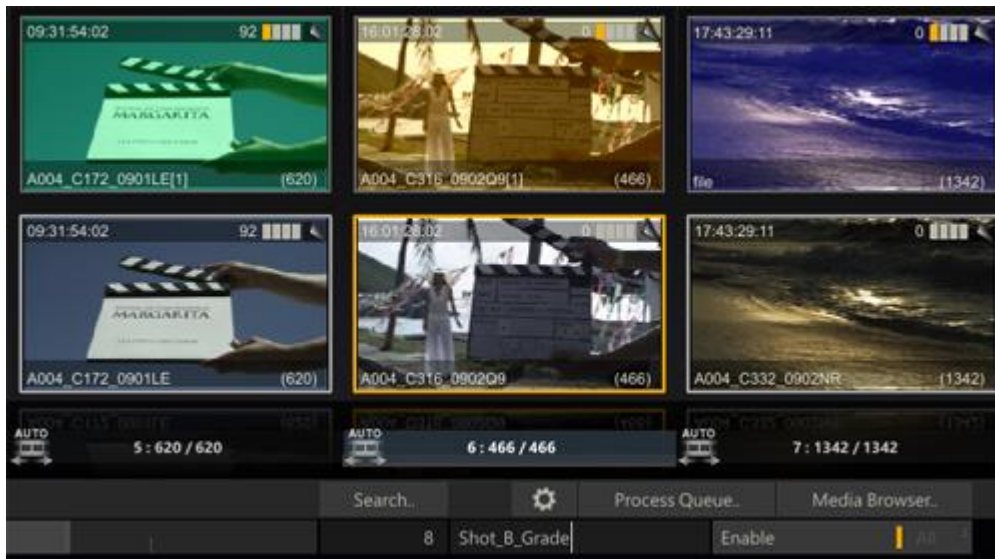
- The Slot Information Area highlights (blue) to indicate which slot is currently selected.

- The light-grey-bar below the current Slot indicates the actual length of the clip in the slot in relation to the length set for that slot.

- Each Slot has an icon at the bottom. This icon indicates whether a slot is enabled or not and whether the duration is set manually.

- By default the start timecode of the slot in the timeline of the CONstruct is displayed. However you can adjust this to display e.g. Slot-name, Slot-index number, Slot-length in frames or a combination of these, using the User Settings dialog - discussed in detail in the Generic Functions paragraph later in this chapter.

SELECTING SLOTS

The active slot is highlighted by the blue bar at the bottom. You can however select multiple slots for copying, disabling or removing. To make a selection you use the Control and / or Shift key. Select the first slot by clicking in the Slot Information Area as you would do normally to select a slot. Hold down the Quick Key: Shift and click in the Slot Information Area of another slot. All slots between the selected slot and the slot you shift-clicked on are selected (or de-selected when it was selected in the first place). You can also hold down the Quick Key: Control and click in the Slot Information Area at the bottom of the slot. This will toggle the selection state of the slot. To clear a selection, click on any slot outside the information area.
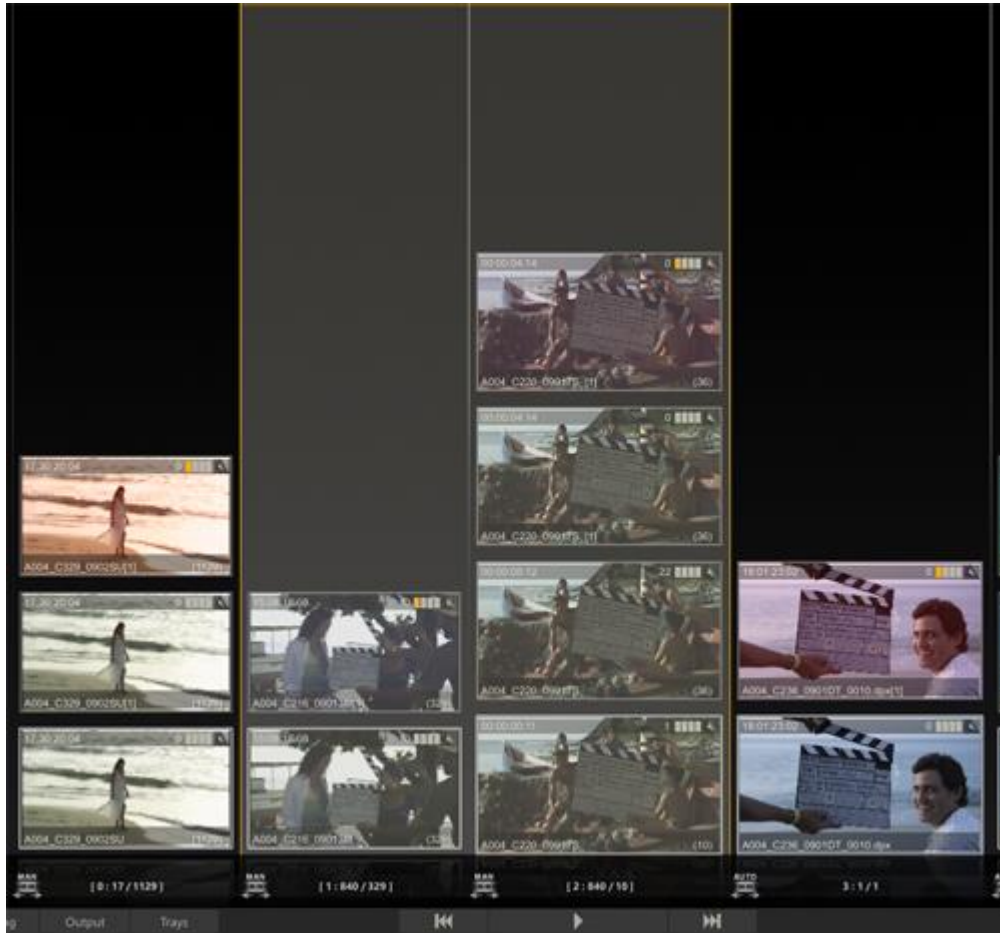
• Quick Key: Control + Left Mouse Click	» Toggle select state of a slot
• Quick Key: Shift + Left Mouse Click	» Toggle select state for a range of Slots

DISABLING, COPYING, REMOVING SLOTS

When you have selected one or more Slots, you can disable, copy or remove them with the menu buttons on the right of the CONstruct menu bar.
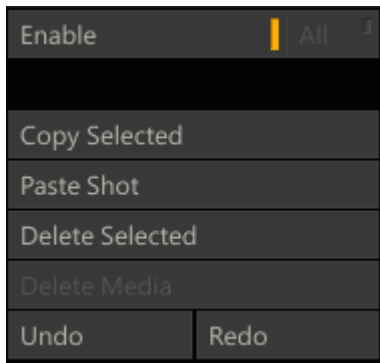
You can disable individual Slots so that they will be skipped for playback when the CONstruct is loaded into the Player. To disable a Slot you can use the **Enable** toggle button. When a Slot is disabled, the slot and the icon at the bottom left of the slot are shown dimmed. When you have multiple Slots on the CONstruct disabled you can quickly enable them by activating one of the disabled Slot and then select the **All** button before clicking the **Enable** button.

Note: Slots can also be disabled and enabled while in the Player - Editor (see Chapter 6 - The Editor for more information).

The **Copy Selection** button will copy all selected Slots into the copy buffer. The **Delete Selection** button will remove the selected Slots permanently. Both buttons only work on Slots that are selected, not on the active slot (highlighted with the blue information bar at the bottom). The **Enable** button works on the selection when one or more Slots are selected, otherwise it works on the active Slot.

SLOT NAME

In the Text Slate next to the Enable button on the CONstruct Menu Bar, you can enter a name for a Slot. This can help you to manage your workflow. By default the timecode of the slot is shown. To display slot names - you select the corresponding option in the User Settings dialog - discussed in the Generic Functions paragraph later in this chapter.

AUTO/MAN ICONS

Each Slot has an icon at the bottom showing whether the duration of the slot is being determined automatically (AUTO) by the length of the bottom shot in the slot or that it was set manually (MAN) - either through a conform from an Edit List or by the user in the Editor.

By default, a slot adapts its duration to the length of the clip that is placed in it. When this is the case, the slot shows the AUTO icon. If the current clip is replaced by a clip of a different duration, the slot adapts to the new duration automatically.

When a Dissolve is used in the transition from one slot to the next a green transition mark is added to the slot icon. As previously described, when a slot is disabled, the slot icon is shown in red.

04 - Interacting with Shots

GENERAL

SCRATCH works with sequences of images on disk; called clips or shots. In order for SCRATCH to recognize a particular shot, it must first be loaded into a CONstruct. While working in the CONstruct you will be interacting with shots in a variety of ways; from bringing shots into the CONstruct to getting information about a shot, moving and copying shots between slots and CONstructs, and arranging shots into specific orders.

To load a single shot, switch to the Media Menu and use the Load Media button. This opens a SCRATCH Browser, which you can use to navigate to a particular shot. Select the shot in the Browser and click on Open. The selected shot attaches to the cursor as a thumbnail and you can place it down in any slot simply by clicking over a slot. The shot will drop to the bottom of the slot. The loading of single shots or multiple shots is discussed more extensively later in this chapter.

Tip: You do not need to continue holding down the mouse or pen to keep the shot attached to the cursor. It remains attached until you click down again on another slot.

Note: The User Interface remains active even when a shot is attached to the cursor. This allows you to continue to interact with the interface without losing your selected shot(s). There are several actions within SCRATCH that require a shot to be attached to the cursor before they become active.

SHOT THUMBNAILS

The thumbnail image of a shot in the CONstruct is a real time generated proxy of the original image. As a result, the thumbnail image is always an accurate representation of the original shot.

ACTIVE ZONES

The thumbnails have a number of Active Zones that allow you to interact with the shot.

Shuttle Zone

The very top area of the thumbnail is a shuttle zone that allows you to shuttle through the frames of each shot by clicking and dragging at the top of the shot thumbnail. This displays a silver Shuttle Bar that represents the current shuttle position within the entire clip.

Pick-up Zone

Clicking in the center area of the thumbnail picks up the shot and attaches it to your cursor. Once attached to the cursor, shots can be moved, copied and deleted. The User Interface is not locked out once a shot has been attached to the cursor. For example, you can create new CONstructs, Groups, or perform other actions with the shot attached. Some functions in SCRATCH only become active once a shot has been attached to the cursor.

Information Zone

Clicking in the shaded bar at the bottom of each shot opens up an Information Panel that gives you access to the shot meta data. Shot meta data is discussed later in this chapter.

THUMBNAIL OUTLINES

The colored outline around each thumbnail provides you with information about the clip and its current status.

The bottom row of clips - the Timeline clips - always have a white outline around them to indicate that they are the clips that will be played by default. This is an easy way to identify the Timeline clip in a slot that has been slid up or down. Selected clips - whether on the bottom row or not - have a thicker outline using the selection (orange) color.

When you first select a clip a Play icon appears inside the proxy image which will fade out after a few seconds. If you click the shot twice it will open just that shot in the SCRATCH Player - as opposed to entering the Player with the full timeline.

The normal or non-selected outline of a clip indicates whether a clip is Local or Remote. Local clips have a gray outline around them. A Local clip is a clip that has been loaded from within the current Project's Media Directory. Local clips use the Media Directory as a relative starting point to find the associated media file. They always remain connected as long as the media files maintain the same location relative to the Project's Media Directory, which can be changed at any time in the Project Settings Menu on the Startup Screen.

Remote clips have a red outline around them. Clips that are loaded from outside the current Project's Media Directory are considered Remote since they use an absolute path to the associated media files. As a result, if a Remote clip's media files are moved from that absolute location, the connection within SCRATCH will be lost.

TIMECODE INFO

In the upper-left corner of each thumbnail the Timecode of the current thumbnail frame is displayed.

CURRENT THUMBNAIL FRAME

In the upper-right corner of the thumbnail is the current frame counter. This indicates what frame of the current shot is being shown in the thumbnail. This number is an absolute count from the beginning of the shot.

SHOT NAME

The lower-left corner of the thumbnail displays the Shot Name. This is set initially based on the name of the files that are being used as the source for the shot. However, the Shot Name can be changed at any time through the Information Panel.

TOTAL FRAMES

The lower-right corner of the thumbnail displays information about the IN and OUT points that are marked on the shot. The value indicates the number of frames between the IN and OUT marks. The brackets on either side of the number are a quick indicator of where the IN and OUT marks are located relative to the first and last frames of the shot.

If the IN and OUT marks are at the first and last frame of the shot, the total frame count has parenthesis on either side like this: **(403)**

If the IN or OUT marks have been moved to a different frame within the shot, either through an EDL conform or manually, then a bracket and dot indicate there are additional frames available either before or after the IN and OUT marks. For example, **[.406.]**

In the image below, the IN mark is on the first frame of the shot, so there is a parenthesis on the left side of the total frame count. But, there are additional frames available beyond the OUT mark, so there is a dot and bracket on the right side. The total number of frames between the IN and OUT marks is 350.

WARNING TRIANGLES

SCRATCH maintains a database of all shots that have been loaded into a project with information about the filename, resolution, frame range, and color space, to name a few. When a shot is loaded, SCRATCH looks it up in the database and compares the values of the shot to what is in the database. If SCRATCH detects an inconsistency in a shot, a warning triangle appears on the thumbnail to alert you.

Situations that can cause a warning triangle are:

- Failing to decode an image, which might indicate file corruption or an older of non-functioning decoder.
- Mismatched timecode – For example, the DPX header timecode has a value of 25 for the frame count, but the Framerate for the shot has been set to 24.
- Altered Timecode, Resolution, Frame Coun, LOG/LIN Flag or Bit Dept.

FILM CANS

A Film Can icon is displayed in the thumbnail when SCRATCH cannot locate the source media for a particular shot. This can happen during a Conform when the EDL contains an event for which SCRATCH cannot find a matching source clip, or if source media is moved outside of SCRATCH.

STICKY NOTES/ NOTE TAG

Each shot in SCRATCH (as well as the Group and CONstruct items in the Project Tree) can have one or more Sticky Notes associated with it to annotate it. Clicking the tag in the upper-right corner opens the Note Editor. Alternatively you can use Quick Key: N while placing the cursor over the thumbnail.

• Quick Key: N   » Pop-up the notes editor

By clicking the colored area in the Notes Editor you can enter text. The annotation is linked to the timecode displayed. The gripper next to the timecode allows you to drag the Editor across the screen.
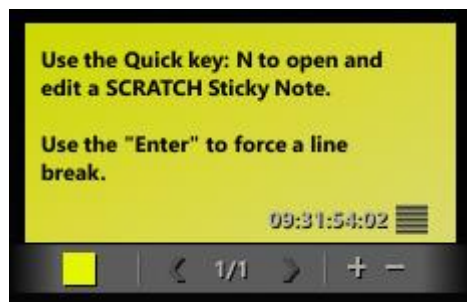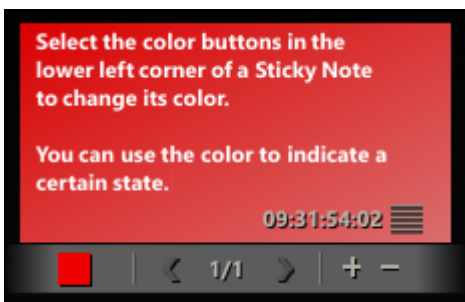
The toolbar at the bottom of the Note Editor allows you to select the color of the current sticky note. Use the **+** and **-** buttons to add or remove a note. The middle section of the toolbar shows you how many notes there are and what the current note it. Use the **<** and **>** buttons to browse through multiple notes. Click anywhere outside the Editor or press the Quick Key: Esc to close it - all information is automatically preserved.

- Quick Key: Esc   » Close the notes editor

By default - if a shot has a sticky notes associated with it this is displayed in the thumbnail as an overlay. If a shot has multiple notes associated with it (of different status colors) the top bar of the overlay will show all the different colors. You can switch off the display of the overlay using the CONstruct Settings dialog - discussed later.
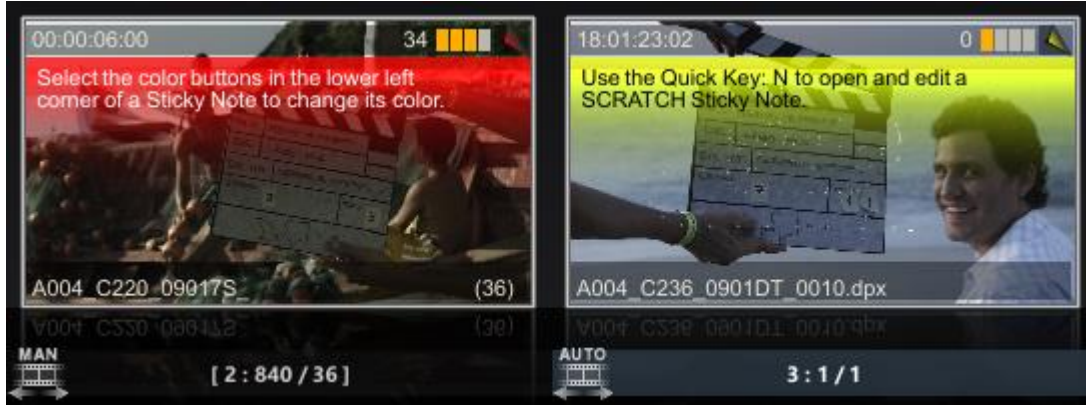
COLOR GRADE BAR CODE

By default a Barcode is displayed in the upper right corner of a thumbnail. Each of the bars in the Barcode provides information about the state of a specific aspect of the shot, by showing white or colored.

- The first bar indicates the presence or absence of a primary grade.
- The second bar indicates the presence or absence of a secondary grade.
- The third bar indicates the presence or absence of Layers on the shot.
- The fourth bar indicates the use of shot framing.

AUDIO REFERENCE

A Shot can have embedded audio (in the underlying physical file) or can be linked to an audio track. In both cases an speaker icon will be displayed in the top bar of the thumbnail.

The colour of the speaker-icon indicates whether it is embedded (white) or a reference to a separate audio file (coloured).

Note: Audio can also be linked to the Timeline as a whole. In that case the individual shots of the Timeline will not show the speaker icon.

SHOT META DATA

Each Shot in SCRATCH caries with it meta data. All shots have properties like a timecode, framerate, aspect, etc. Next to the fixed meta data items a shot can have any number of extended meta data items - name/value pairs such as Exposure Index, Camera Shutter Speed, etc. You can manage a shot's meta data using either the Information panel or the Meta Data Stack

META DATA STACK

You open and close the Meta Data Stack with a swipe action of the pen to the right of the View Port.

• Swipe Action: Left	» Show/hide the Project Tree

The Meta Data stack displays the meta data of the current selected shot. The Meta Data Stack is combined with the Source stack - which displays the composite hierarchy of the shot and its elements. The Source Stack and the Meta Data stack are also available in the Player and are discussed in more detail in Chapter 5 - The Player.

55

INFORMATION PANEL

The Information Panel can also be opened by placing the cursor over a shot and pressing the Quick Key: I .

• Quick Key: I	» Open the Information Panel for the shot under the cursor.
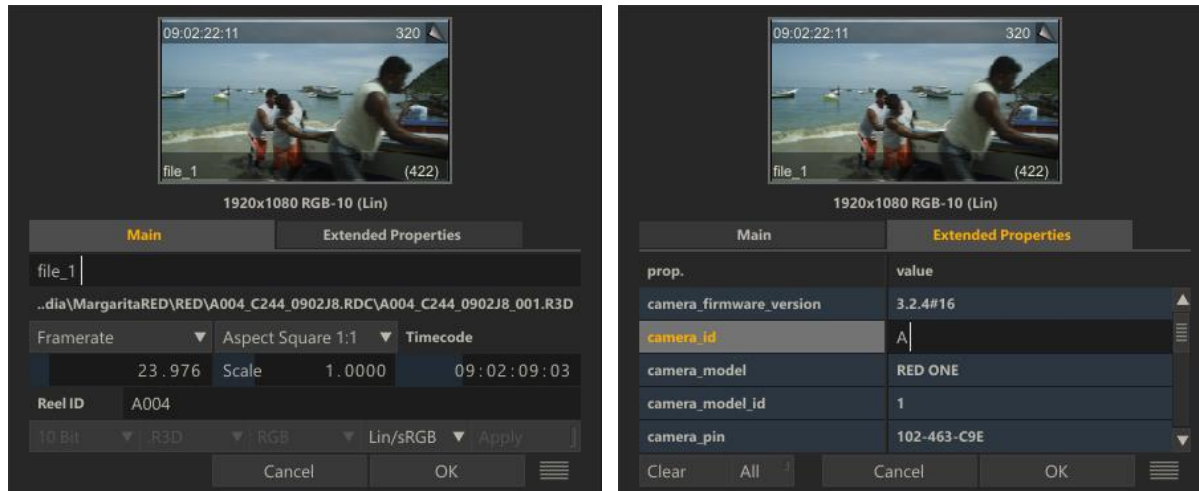
At the top of the Information Panel the shot proxy image and the original X and Y resolution and color space of the shot are displayed. The rest of the information is spread out over two tabs - Main and Extended Properties. You can adjust most of the main properties using the available controls. In the Extended properties you can only update the values by clicking the appropriate cell.

Changes to the Information Panel can be accepted with the **OK** button and cancelled with the **Cancel** button. Clicking anywhere outside the Information Panel is the same as clicking on the **Cancel** button.

Note: When you make a change to an editable value in the Information Panel, you must press Enter to accept the change. Once you press Enter, that change is made immediately and does not require pressing OK in order to be accepted. Pressing Cancel after pressing Enter does not revert the value back to its original.

Tip: Multiple Information Panels can be opened at one time by using the Quick Key: I. However, each Information Panel must be closed separately by either pressing OK, Cancel, or clicking outside of the Information Panels. In case of the latter, the panels are closed in the order in which they were opened.

META DATA ELEMENTS

Each shot in SCRATCH has a number of fixed meta data items. In addition to these fixed items, a shot can have an unlimited number of extended meta data items (name/value pairs). Most meta data is automatically loaded from the underlying media files. Alternatively meta data can be imported using e.g. an ALE or SCRATCH's own XML scripting. You can also add your own items from within SCRATCH or update existing meta data items. Note that changing certain meta data will have an effect on how the clip plays back or behaves in a timeline context. The list below covers the fixed meta data items. Note that most but not all are available in the Information panel - but are in the meta data stack.

- Name - in most cases the file name of the underlying media. Changing the name will however NOT change the name of the underlying media file.

- Source Timecode – This is the timecode that is associated with the shot. If timecode is present in the header of e.g. a DPX file, that timecode value is used. For files of a file-sequence where no timecode is present, the frame number of the source file is converted into a timecode based on the Framerate setting. You can manually alter the timecode of any shot by entering a new value into this Numerical Slate. The timecode will be applied to the first frame of the shot and will increment throughout the entire shot.

- Reel-ID - either read from the underlying media file or set when conforming from an EDL that contains a Reel-ID.

- Scene & Take - note that not all media type include scene and take information or pass it under a different name, so that it is available from the extended meta data items.

- Resolution - can not be adjusted, although you are able to scale and resize the image using the appropriate tools in the Player.

- Framerate – this value can be adjusted by selecting a value from the predefined list or entering a new custom value.

- Aspect Ratio and Scale – Select one of the values from he predefined list, which will automatically update the scale value or enter a custom scale value.

- The Format, color space and LOG/LIN state are usually determined by the underlying media but can be adjusted. Note that this alters how SCRATCH treats the image data but it will not modify the source file itself.

MOVING A SHOT

Shots can be moved from one slot to another by clicking in the middle of the thumbnail and picking up the shot. By holding down the mouse button momentarily, the shot thumbnail becomes attached to the cursor. The amount of time it takes before a move starts can be set in the User Settings (see Chapter 3 - The Startup Screen). Also notice that when starting a move action, the original location of the shot is shown by a dimmed thumbnail image. You can then drop the shot into any other slot by clicking over that slot.

Note: A shot can be inserted below an existing shot by clicking in the open area just below the other shot. The shot on the cursor is then inserted below the other shot and all shots above are pushed up in the Version Stack.

Note: You cannot move a shot from one CONstruct to another. When a shot is attached to the cursor and you navigate to a different CONstruct a copy is made of the shot automatically and the original is left untouched.

COPYING A SHOT

The process for copying a shot is similar to moving a shot. When you press the Quick Key: Alt when picking up a shot, a copy is created and attached to the cursor. You can drop this copy just like when moving a shot. The original thumbnail image is not dimmed in this case. Alternatively, you can pick up the shot without Quick Key: Alt and then click on the Copy Shot button at the far right side of the Main Menu. The shot that is attached to the cursor now becomes a copy and the original is returned to its position within the CONstruct (the dimmed thumbnail returns to full). You can drop this shot down anywhere in the CONstruct.

You can copy single shots or even multiple selections in this way.

Tip: Shots can be copied between CONstructs by simply picking the shot up, changing to a different CONstruct by selecting it in the Project Overview List, and then dropping the shot into a new location on the other CONstruct. This automatically creates a copy without the need to press the Copy Shot button first.

There is also a Quick Key available for copying a shot, use the Quick Key: C while the cursor is over the shot.

• Quick Key: C	» Copy the shot under the cursor and attach to the cursor.
• Quick Key: Alt + Left Mouse Click	» Copy the shot that was clicked on

Note: Making a copy of a shot will by default also make a copy of all the inputs of the shot. This behavior differs from previous version of SCRATCH. This *deep copy* behavior and its consequences are described in more detail in the paragraph about **Reference CONstructs**, later in this chapter.

PASTE SHOT

When a shot has been copied, the copy remains in the Copy Buffer. The Paste Shot button can be used to insert another copy back into the CONstruct. The shot is pasted into the CONstruct at the bottom of the currently selected slot. All other shots within that slot are pushed up in the Version Stack; the newly pasted shot is placed at the bottom of the stack, making it the current version.

Note: The current slot is indicated by a highlight in the Slot Information Area. Keep in mind that the currently selected slot may not be visible within the View Port.

MULTIPLE SHOT SELECTIONS

You can also select multiple shots to be moved or copied. There are different ways to select multiple shots. One way is to hold down Shift of Control key and drag mouse from an empty section on the CONstruct over multiple clips. All shots that are (partly) covered by the semi-transparent rectangle will be selected (or de-selected when the status of the clip was selected in the first place).
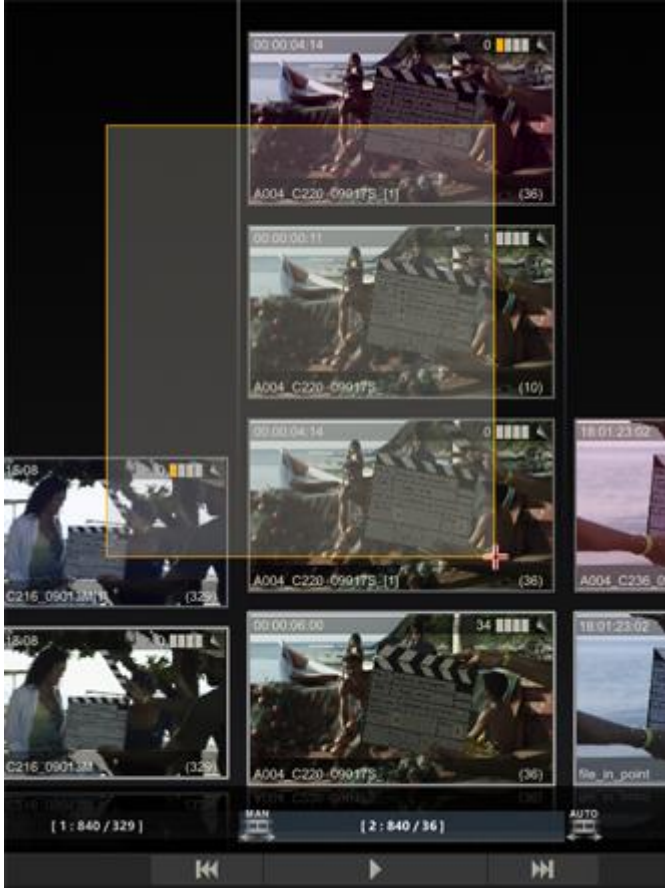
Alternatively, there are multiple Quick Keys to select more than a single shot:

• Quick Key: Control + A	» Select all shots in the CONstruct
• Quick Key: Control + D	» De-select all shots in the CONstruct
• Quick Key: Shift + Left Mouse Click	» Extend contiguous selection till shot that was clicked on.
• Quick Key: Control + Left Mouse Click	» Toggle selection of shot clicked on (allows for non-contiguous selection)
• Quick Key: Shift + Left Mouse Click + drag	» Add all shots (partially) overlapped by area select to the main selection
• Quick Key: Control + Left Mouse Click + drag	» Toggle selection mode of all shots that are (partially) overlapped by the area selection.
• Quick Key: Control + 1… 9	» Selects all the shots on layer '1' etc
• Quick Key: Control + R	» Selects all the shots in the slot beneath the cursor

Once you have multiple shots selected, the Copy command updates itself to become Copy Selection. This functions the same as Copy Shot, but the entire selection will be copied.

Likewise, multiple shots can be pasted into the CONstruct using the Paste Shots button. The shots are pasted into the bottom row of each slot, starting with the currently selected slot and moving to the right.

REPLACING SHOTS

When loading, copying, or moving a shot, you can use the Quick Key: Control to apply properties such as handles, vari-speed, and shot framing from a shot in the CONstruct to the shot you are dropping.

Select the shot by holding down Control and clicking on the shot. The thumbnail gets a thick white border around it, indicating that it is selected. Release Control and pick up the selected shot. Place the cursor over the shot you want to copy the properties from, hold down Control again, and drop the shot. The shot is dropped into the same slot and adopts the handles, vari-speed and framing from the underlying shot. This is an effective way of replacing one shot with another, while still maintaining any modifications that have been made.

- • Quick Key: Control   » Apply properties of underlying shot to shot being loaded

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Note: Any color grading that has been applied to the shot will not be copied onto the replacement. This can be done from within the Color Module.

DELETE A SHOT

To remove a shot from a CONstruct, use the Delete command. The Delete button is located just below the Copy and Paste buttons on the right side of the Main Menu. It functions similarly to the Copy and Paste buttons and can be used on multiple selections. With multiple selections, you are asked to confirm the Delete command a second time with a button on the right side of the Menu Bar.

Note: Deleting a shot does not remove the original source files; it merely removes that instance of the shot from the current CONstruct within SCRATCH.

05 - Media Menu

GENERAL

The Media Menu has all the controls for loading clips into a CONstruct, loading or exporting an edit-list or shot meta-data, manage shot sticky notes and slots.
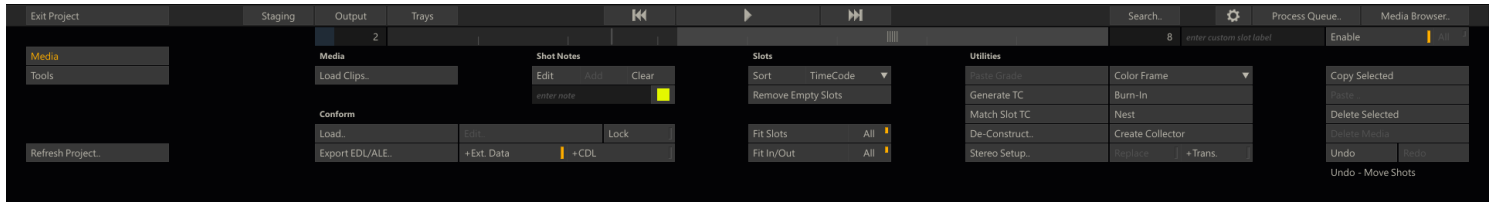
MEDIA

LOAD CLIP(S)

The Load Clip(s) button allows you to load a single shot or multiple shots at once into the CONstruct. This button opens a SCRATCH Browser where you can navigate to the location of the media you would like to load.
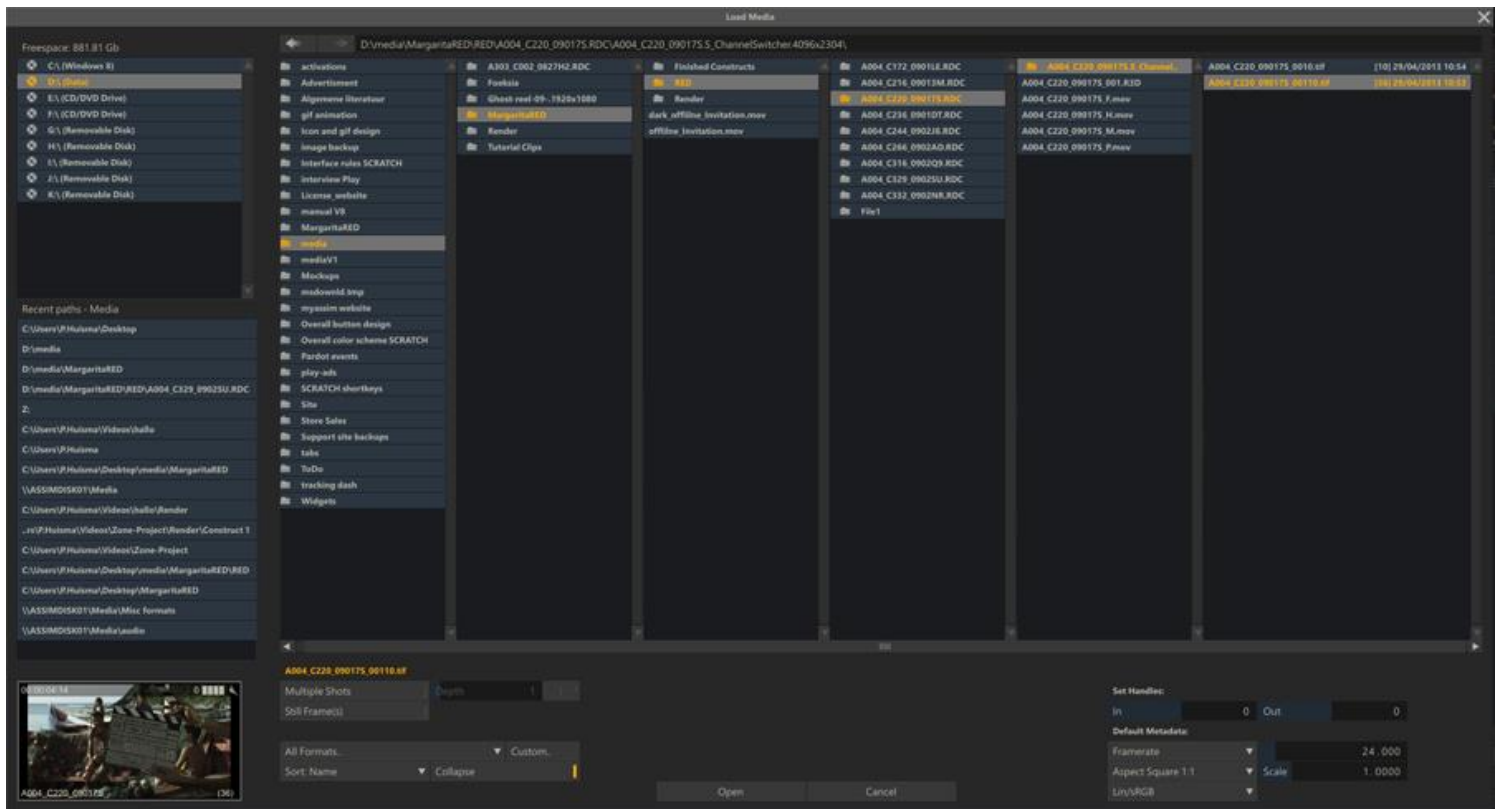
By default SCRATCH recognizes entire file sequences and groups them together into a single entry in the Browser. The number of frames in a sequence is shown in square brackets.The Browser has various functions to facilitate loading lots of shots at once. You can load a clip by selecting it in the Browser and pressing the Open button or by double-clicking on the clip name. Once the clip is loaded, it is attached to the SCRATCH cursor and you can select which slot to drop the clip into.

Note: You do not need to continue holding down the mouse or pen button. Once a clip is attached to the cursor it remains there until you click on a location, or an action button in the interface.

Next to the basic single shot load, the Browser has various functions to facilitate the task of loading large numbers of shots at the same time.

Multiple Shots

When you enable the **Multiple Shots** button you only have to select the base-level folder for the Load operation. SCRATCH searches from the base-level folder down through any sub-folders, and loads any image file that it finds. By using the **Depth** Numerical Slate, you can control how SCRATCH interprets the folder structure and how the clips get loaded.

60

For example, assume you have the following folder structure with a file sequence in each of the Take folders:

\Roll_01
　\Scene_01
　　\Shot_01
　　　\Take_01
　　　\Take_02
　　　\Shot_02
　　　\Take_01
　　　\Take_02
　　　\Take_03
　　\Shot_03
　　　\Take_01
　\Scene_02
　　\Shot_04
　　　\Take_01
　　　\Take_02
　　　\Take_03
　　\Shot_05
　　　\Take_01
　　　\Take_02
　\Scene_03
　　\Shot_06
　　　\Take_01
　　　\Take_02
　　\Shot_07
　　　\Take_01
　　　\Take_02
　　　\Take_03

If you select the Roll_01 folder as the base folder, with a Depth setting of 1, all the clips from the base folder down will be loaded into 3 slots. Slot 1 would contain all the shots within the Scene_01 folder; Slot 2 would contain all the shots within the Scene_02 folder; and Slot 3 would contain all the shots within the Scene_03 folder.

As a second example using the same folder structure but setting the Depth to 2, would result in 7 slots, one for each Shot folder.

In this way, you can control how the shots are loaded in so that they maintain the same overall structure once they are loaded into SCRATCH. This can be especially useful when loading large numbers of folders, but still being able to find a specific shot quickly for review.

Note: The Multiple Shots function can theoretically take a long time to finish. To abort the function, press Quick Key : Escape.

Inverse (I)

By default SCRATCH will add each shot found on top of any shot already present in a Slot. By using the **Inverse** (**I**) button you can change this behavior. When enabled, SCRATCH will put each shot found on the first (timeline) layer of the Slot. Reversing the load position can be helpful if you want to replace an existing timeline with a newer version of the media, while maintaining the existing one as a version.

Still Frames

By default SCRATCH recognizes frame sequences and loads them as a single shot. Use this option to override this behavior and load each file as an independent still frames.

Formats

This option presents you with a list of all formats SCRATCH can read. Use this option to filter the results the Browser is showing. By selecting the format - you also control how certain media is interpreted. Some media might have the same file extension but can only be interpreted in a certain way. By setting a specific format you help SCRATCH determine this interpretation process and as such speed up the loading considerably.

Custom

The **Custom** option allows you to create and apply a more advanced filter for loading media. The option shows a dialog to enable multiple specific formats. This way you can make your custom selection. Make sure the **Formats** option is set to Custom.

Sort

Sort order for the display of folders and files: name or file (modified) date.

Collapse

By default SCRATCH shows file-sequences as a single file with the number of files. When switching off this option SCRATCH will show all individual files. Please note that whatever file you select - SCRATCH will still load it as a sequence starting at the first frame. Unless you enable the **Still Frames** option.

Set Handles

The two Numerical Slates; In: and Out: allow you to select a default number of frames to be assigned as handles to the clips loaded. In: will be the handles at the head of the clip and O: will be the handles at the tail of the shot.

The handle values can be used in situations where a known number of head and tail handles exist. For example, if a project is scanned from film using a standard 8 frames of handles at the head and tail, you could set the head and tail handles in SCRATCH to 8, and all shots would be loaded with their IN and OUT marks already set to eliminate the 8 frame handles. The handle frames will still be available, but by default the portion of the shot that determines the slot length in SCRATCH, will also be the duration between the IN and OUT marks.

You can modify the in- and out handles of loaded clips further from within the Editor (See Chapter 6: The Editor) or from the Media Browser (see in a later section of this chapter).

Project Metadata Defaults

In most cases SCRATCH will read the framerate, scale and particular color space for a clip from the metadata information in the media file(s). In case the file does not contain that information - SCRATCH will use the project defaults. You can adjust these default with the controls in this section.

Note: The values entered here are ONLY used for media that does not have proper metadata available itself - no metadata is overridden by these settings.

CONFORM BUTTONS

A detailed explanation of the Conform process is available later in this chapter. From the Media menu the loading of an external edit list and exporting to file of the current CONstruct timeline is discussed.
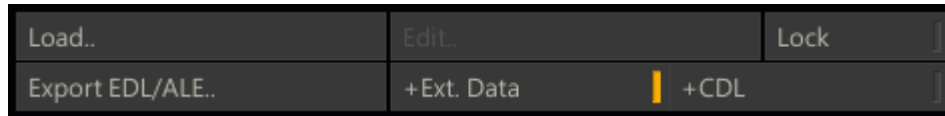
LOAD CONFORM

The Load Conform button opens a SCRATCH Browser where you can navigate to the folder where the edit list or metadata file is located and set the type of file you want to load - either AAF, Final Cut XML, EDL or ALE. Depending of the type of file a different Conform Dialog Window opens with edit events or meta-data. For more details of the different conform options later in this chapter.

EDIT CONFORM

After loading a file all edit events or metadata are displayed in the Assemble dialog. You can close a dialog and reopen it again later by using the Edit button. This allows you to stop working on the edit events or metadata temporarily, e.g. navigate to another CONstruct and reopen the dialog again. Note that exiting a project will discard any changes you made to a loaded conform.

EXPORT EDL / ALE

The Export EDL / ALE button creates either a CMX-formatted EDL file or an ALE (Avid Log Exchange) file for exporting metadata outside SCRATCH in ASCII format. The EDL file contains the current CONstruct; source time code for each clip and the record time code of each clip, starting on the Record Timecode that is set on the CONstruct's main Output. The ALE is a tab delimited file containing clip name, source- and record time codes, clip length, reel ID and slot number, etc. On export of an EDL or ALE there are two additional options you can use:

- The **+Ext. Data** button will for an EDL include the annotations of a shot as comments in the EDL. For an ALE all metadata name-value pairs will be added next to the default columns in an ALE, such as clip name, reel ID, source- and record time code.

- The **+CDL** button will add ASC Color Decision List information to both the EDL and ALE. The formatting in the ALE is in line with the 'ASC CDL Avid Workflow' specification.

Note that if CDL compatibility is required only a limited set of grading parameters should be used in SCRATCH. For more details on the translating of ASC CDL information to and from the SCRATCH color pipeline, see the section about EDL Conforming later in this chapter.

SLOT MANAGEMENT

SORT

The Sort function will let you change the order of the shots in the CONstruct based on four different criteria: Source Time Code, Name, Scene & Take and Shot Length. This is a permanent operation and there is <u>no undo</u>. You should make a copy or save the CONstruct first if you need to go back to the previous order. The function is useful if you are processing a timeline and need the results to have a different order or in combination with PLAYOUT to assemble to tape while recording the Source TC of the shot on the tape.

REMOVE EMPTY SLOTS

All Slots without clips are removed from the current CONstruct.

FIT SLOTS

The Fit Slots button modifies the length of the selected slot to match the length of the In and Out marks on the lowest clip in the Slot. This is a quick way of setting the slot's duration to match the marked duration of a clip. If the All button is selected, all slots in the timeline are modified at once.

FIT IN/OUT

The Fit In/Out button modifies the In and Out marks of a clip to the duration of the Slot in which it is located. This is a quick way of setting the duration of a clip to match the Slot. If the ALL button is selected, all clips on the bottom row of the timeline are modified at once.

LOCK

The Lock Timeline button locks the timeline so that no modifications to the edit durations, shot timings, or transitions can be made.

Note: If a locked CONstruct is loaded into the Edit module, the parameters for adjusting the edits will be grayed out in the Edit Menu.

SNOT NOTES

This section allows you to manage the notes on all selected shots.

EDIT

Opens the note editor for the first selected Shot

ADD

Adds a note to all selected shots - using the text from the text slate below the button and the status/color selected next to the text slate.

CLEAR

Remove all notes from all selected shots.

UTILITIES

PASTE GRADE

This button will start a matching process between all the *selected* shots on the current CONstruct and all the shots in the copy buffer.

Note: If no shots are selected, SCRATCH will include *all* the shots on the current CONstruct in the matching process.

If SCRATCH determines a match, it will copy all the grade and framing from the shot in the copy-buffer to the shot on the CONstruct. This function is useful when you have a fully graded timeline and do a different conform / second version with the same clips on another CONstruct. You can copy all shots on the first CONstruct, navigate to the new CONstruct and then Paste Grade the new timeline.

The matching process tries to find the best match between a shot on the CONstruct and all the shots in the copy buffers, based on the amount of overlap calculated from the time-code of the shots and its in- and out-points. The out-point used is the lower of the out-point of the shot (which, if not explicitly set, is its length) or the length of the Slot in which the shot resides. Only when the amount of overlap is exactly the same for multiple shots, SCRATCH includes the name and reel-ID of the shots into the comparison.

MATCH TC

This function aligns the time-codes of all version shots in a slot with the timeline shot. The in- and out-points of the version shots are adjusted with the difference in time-code with the timeline shot.

GENERATE TC

This function (re)sets / adjusts the time-code of all shots on the timeline in the CONstruct. Selecting the button opens a dialog to set the parameters for the function.
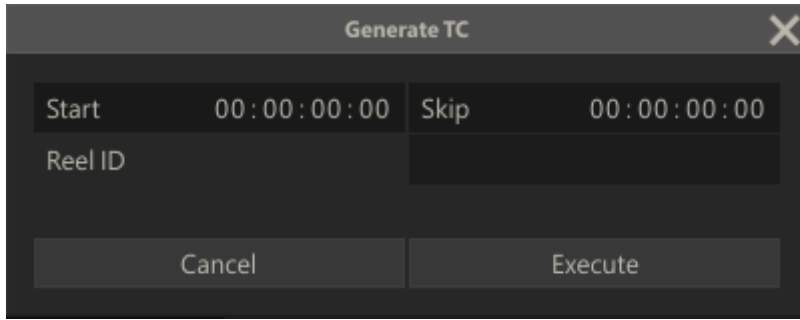
The time-code for the first clip will be the **Start** time-code set and for each subsequent shot the length of the prior clip plus an (optional) **Skip**-interval. The interval is combined with the length of the prior clip so that the time-code of each clip is set to a whole rather than a fractional number of intervals and as such can be set to start at a whole minute or second. Optionally you can also update the **Reel-ID** of all the clips.

DE-CONSTRUCT

The **De-Construct** function creates a stripped version of the current Timeline for more efficient processing. Selecting the button opens a dialog to set the parameters for the function.
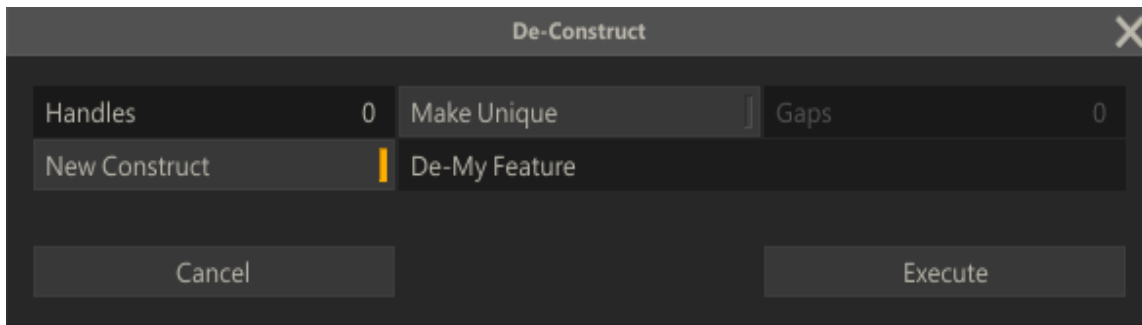
The **De-Construct** function will:

- add additional n **Handles** to each shot.

- **Make Unique** removes shots that are used more than once in the timeline while adjusting the in- and out-point of the remaining shot so that all media used is covered.

- the **Gaps** parameter determines when to consider a shot unique compared to another shot that points to the same underlying media but has no overlapping in- and out-points. If the number of frames of the out-point of shot A and the in-point of shot B differ less, SCRATCH considers A and B the same shot (and will also include some of the non-used frames). The default value is 0, meaning A and B only be considered the same if using the same underlying media track and having overlapping in- and out points.

- you can create the stripped timeline in the current construct or create it in a **New Construct**.

Note: The **Unique** option ignores and does <u>not</u> compare grades, SCRATCH only considers the time-code and underlying media to determine if two clips are the same.

STEREO SETUP

The **Stereo Setup** function creates Stereo Nodes for all left Left/Right pairs on the CONstruct. Selecting the button opens a dialog to set the parameters for the function.
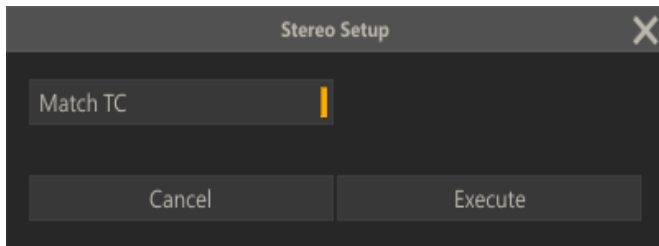
This allows you to set the default **Frame Pattern** for the Stereo Node. Please see Chapter 9 - Process and Plug-ins for more details on the Stereo node. The **Match TC** Option is identical to the Match TC function discussed earlier in this chapter but applying only to the left/right shot pair.

COLOR FRAME

The Color Frame button creates a single frame shot of a specific color or pattern; Black, White, Linear or Log, Color Bars, Gradient or Zone plate. The created shot is attached to the cursor and can be dropped in any slot / position. The settings of the shot can be adjusted in the Player in the FX Ctrls menu in the Process module.

BURN-IN

A Burn-in node allows to display text overlays in any available font and size, displaying metadata of its input shot, display subtitles using an external file or displaying guides.

NEST

Using this button will wrap each of the selected nodes in a new Nest node. The Nest Node allows you to adjust and animate the size and position of the input shots as well as providing a shielding layer on the underlying composite.

COLLECTOR

A Collector node can be viewed as a 'timeline in a node'; it encapsulates multiple shots including the transitions from one shot to the next. This way a Collector node adds another dimension to the CONstruct.

Note: When entering the Player with a single Collector node and navigating to the Edit module, you can edit the underlying timeline; editing transitions, length of slots and remove existing or add new nodes into the Collector node.

A Collector node can be created by selecting multiple shots on the CONstruct and then clicking the Collector Node button. The collector node will by default get the name of the current CONstruct with a 'CLT' prefix.

How a selection of shots is processed into a Collector node depends on a number of factors

Dragging vs CONstruct selection

If a series of Shots is dragged onto the Collector Node button, a basic Collector Node is created with no special transition options set. The newly created Collector node is attached to the pen and can be dropped anywhere in the current CONstruct or on another CONstruct.

When the Collector Node is created from a selection on the CONstruct there are two additional options available.

Replace

This option is only available if all selected shots are in consecutive Slots and on the same layer. Enabling this option will remove all the Slots where the selected Shots reside from the CONstruct; virtually collapsing the slots. A new Slot is created in which the Collector node is placed. Any Shots in the slots involved that are not part of the main selection, are placed in the new Slot, on top of the Collector node.

If this option is disabled or not available, the new Collector Node is attached to pen and can be dragged and dropped elsewhere in the project. All the Shots in the selection and the Slots they reside in remain untouched.

Note: The Collector Node contains references to the selected shots, not copies! This means that if the selected shots remain on the CONstruct, editing them will also change the Collector Node.

+Transitions

When this option is enabled all the shots of the selection are added to the Collection node including the (Slot) transition settings: Slot length (if set explicitly), any Dissolves or other transition settings. This option is on by default if all the Shots in the selection reside in consecutive Slots and on the Timeline layer. In other selection you need to explicitly enable the option.

Mini-Timeline

The Collector node is similar to any other node; it can have its own grading, In & Out points, used in a composite, etc. A Collector Node can be recognized by the mini-timeline that is displayed in the top bar of the Shot proxy.

Expand Collector

When selecting a single Collector node on the CONstruct you can extract *copies* of all the underlying shots by using the **Expand** button, When the Collector node is dragged onto the **Expand** button, the extracted Shots are attached to the pen and can be dropped elsewhere in the project. When the Collector node is on the Timeline layer, copies of underlying Shots are extracted and the first Shot is placed in same Slot as the Collector Node resides with every next Shot in a new created subsequent Slot. If the Collector Node is not on the Timeline layer, all shots are placed in existing Slots on the same layer as the Collector node. In both cases the Collector node itself remains available on the CONstruct.

Note: Any grading, animations or other adjustments applied to the Collector node are NOT copied onto the underlying nodes when expanding the Collector node.

06 - Tools Menu

GENERAL

The Commands sub-menu has options for importing and exporting project data and launch external applications.

COLLABORATION

Publishing Media and use of the Repository are discussed in detail in Chapter 10 - Collaboration Tools.

PROJECT DATA

EXPORT A CONSTRUCT, GROUP OR PROJECT

With the Export function you can save project data in either a proprietary binary format or a XML format to an external file. With the option button next to the Export button you can select what project data you want to export; the current CONstruct, all CONstructs in the current selected Group or all CONstructs in all groups. When pressing the Export button a SCRATCH file Browser is opened for you to navigate to the appropriate folder. By default it will point to the Construct sub-folder in the project folder of the current project. If you save project data in the binary format, the file will have a .dsk, .grp or .prj extension, depending on the export level you choose. The binary file will include all the metadata regarding editorial decisions, color grades, notes and any other information that has been added or modified. If you export in a the XML format, the file will contain the basic project and timeline setup and limited grading information. The XML format is primarily intended for use within workflows utilizing third party systems and SCRATCH's XML scripting capabilities which are discussed in detail in the Appendices of this manual.

Note: If Auto-Export is enabled in the Project Settings menu, an XML output file is automatically created in the specified directory every time a Project is exited. This ensures that any external programs that are parsing the XML output file are always using the most current state of any Project.

IMPORT A CONSTRUCT, GROUP OR PROJECT

The Import button opens a SCRATCH Browser where you can navigate to a (previously exported) SCRATCH file, either in the proprietary binary .dsk, .grp or .prj format or in a valid XML format. Opening the file creates either a new CONstruct in the current Group or one or more new Groups and CONstructs in the current project. By default importing a file does not overwrite an existing CONstruct, unless you used the XML scripting syntax, explained in more detail in the Appendices of this manual.

CUSTOM COMMAND BUTTONS

The middle section of the Timeline Commands menu is available for Custom Command buttons that can link to external applications or scripts, instantiate a plug-in directly on the CONstruct or open a web page while providing metadata to the web server. Custom Command buttons are created through the System Settings - Preferences menu. See Chapter 11 - Customizing SCRATCH for more detail on creating your own Custom Commands.

07 - Staging

GENERAL [Lab]

The Staging area is a per shot holding area to maintain and manage composite elements and versions of those elements for the main shot. The Staging view in the CONstruct shows the Staging areas of all shots on the Timeline; the bottom row in the CONstruct. You open the Staging view by selecting the corresponding button on the CONstruct toolbar. You can revert to the timeline view by clicking the button again.
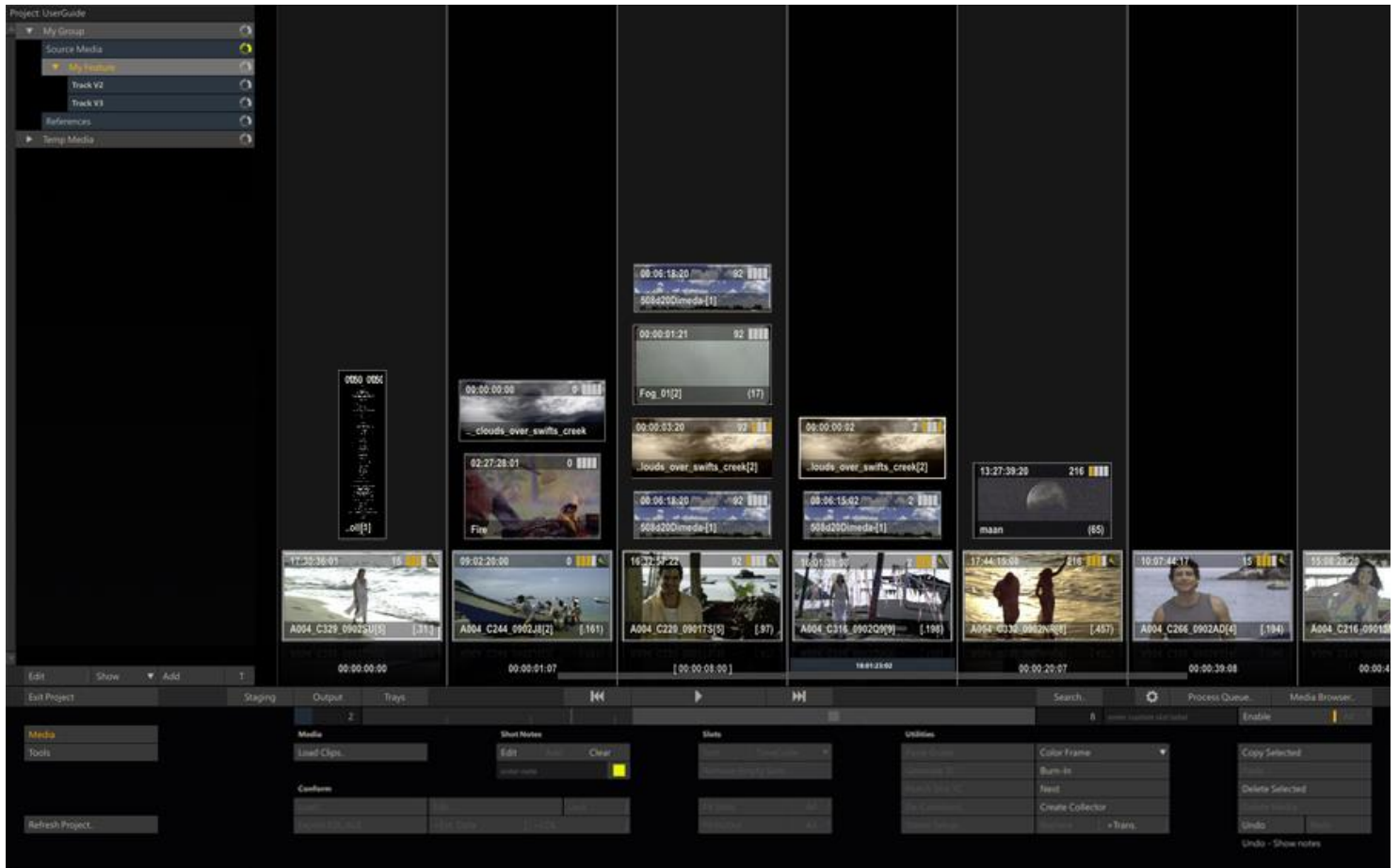
The Staging view has alternating slot colors to distinguish it from the Timeline CONstruct view. The bottom row of shots in the Staging view are the main shots and can not be altered while in the Staging view. The composite elements are stacked on top of the main shot.

The Staging Area is both an actual and virtual holding area:

• It shows elements that were explicitly added, but which are not necessarily used in the composite (yet).

• It shows elements not explicitly added to the Staging area but which are used in the composite shot as input, fill or matte. In this case the proxy in the Staging area has a blue border and the shot cannot be (re)moved from the Staging view.

You can explicitly add elements to the Staging area of a shot using:

• the Load and Load Layer functionality. Note that the Load Layer function will not automatically create new slots on the Timeline. However, if an empty slot is encountered, the Load Layer function will add the shot as a Timeline-shot.

• Copy and Paste shots from a regular CONstruct or different Staging Area. Dragging and dropping a shot - from the Timeline view to the Staging Area or within the Staging Area itself - will create new references to the shot, not a copy. To make a copy of a shot in the Staging Area you need to use Quick-key: Alt+Click explicitly.

When you copy a shot, SCRATCH will also make a copy of the Staging area of the shot - effectively copying each shot in the Staging area.

STAGING STACK

The Staging area of a shot is also available in the Player - discussed in more detail in the next chapter. In the Player the Staging area is available in a right swipe Stack, next to the Version and Layer stacks.

The Staging Stack in the Player will only show the actual Staging shots, not the main shot itself. Further the Stack allows you to add items by dragging them into the Stack, select items from it by selecting an item in the stack and dragging it to a drop target - such as the fill of a Scaffolds. All of this is explained in more detail in Chapter 5 - The Player and subsequent chapters.

08 - Outputs

GENERAL

When you select the **Outputs** button on the main toolbar - all the Slots and Shots of the CONstruct in the Viewport are replaced with the Pipeline view. That view contains all the output nodes of the CONstruct. By default there is one (main) Output Node. The left most icon represents the Timeline of the CONstruct. You can add additional Output Nodes to e.g. render out different formats of the Timeline. The created Pipeline can efficiently process all output versions and formats at once - where each node can serve as input for any number of underlying outputs.
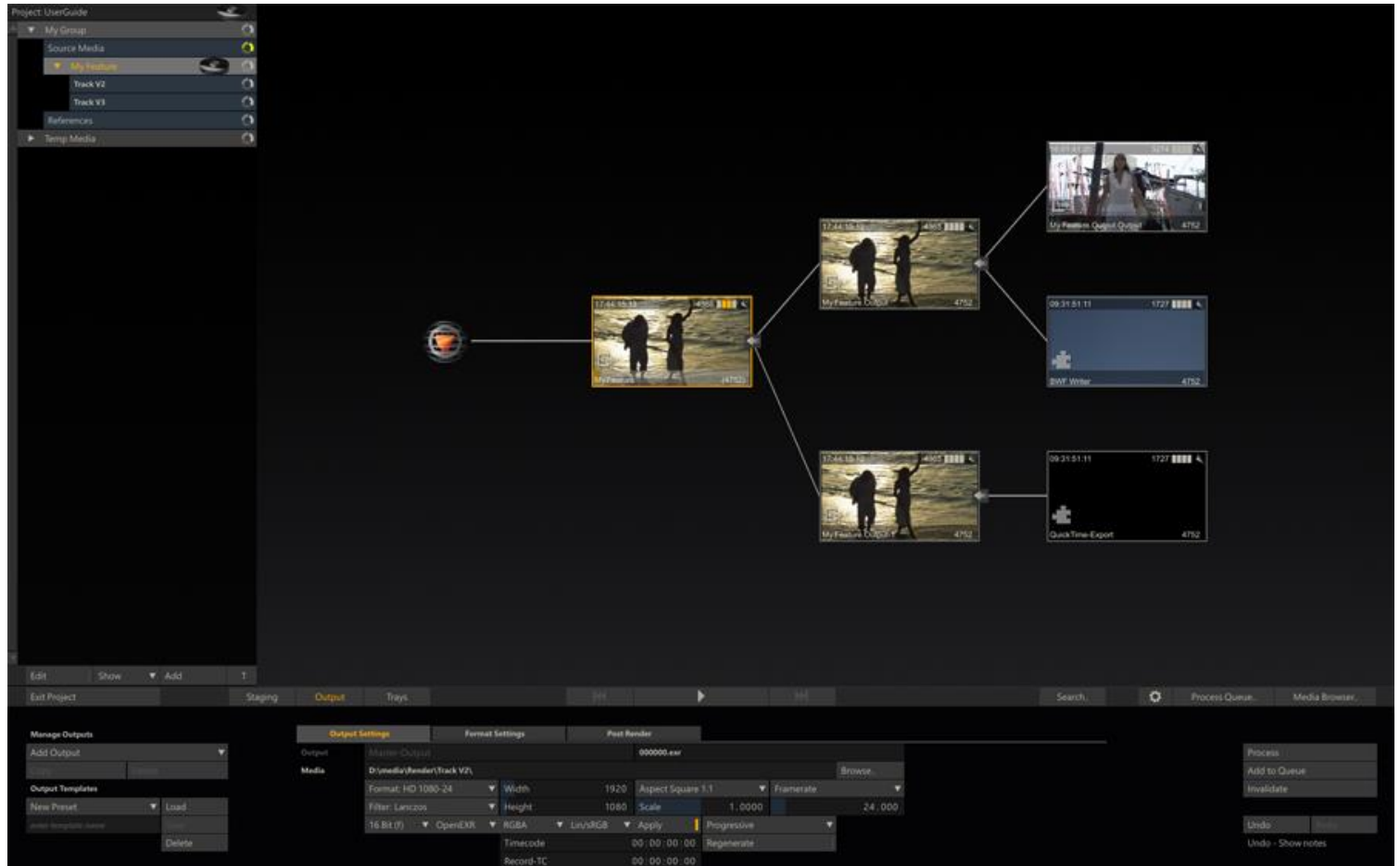
Tip: You can adjust certain settings of an Output Node quickly by dragging and dropping a Clip Node onto it; the Format, Aspect, Framerate and Scale of the Output Node will be updated with those of the shot that was dropped.

MANAGE OUTPUTS

The section on the far left of the menu allows you to add, remove or copy output nodes.

ADD OUTPUT

This button will add a new child Output Node 'after' the current selected node. Clicking the button will show a list of available output formats. The first item 'Image File' is a collection of formats - the specific sub-format is set elsewhere in the menu after adding the node.

Normally you would not create an additional Main Output node - right after the Timeline icon. Only in certain cases when working on a stereo project could this be helpful.

DELETE

The button will remove the current selected output node and all the child nodes after it. The main Output Node and the icon representing the Timeline cannot be removed.

Note: Removing an Output Node will not automatically remove any generated media of the node from disk. To remove the media, you could use the Delete Media button, discussed in the previous paragraph, before removing the node.

70

COPY / CREATE VERSION

Copy the selected node. Use the Paste option in the regular CONstruct view to add the copy to your CONstruct. Note that you can not copy the Main Output node. If the current selected output node has been rendered, this button will read **Create Version**. In that case SCRATCH will create a copy of the node and link the rendered media to that copy while un-linking it from the selected output node. The new copy is attached to the pen and can be dropped in any CONstruct.

OUTPUT TEMPLATES

Rather than adding output nodes one by one for each CONstruct, you can also create and use templates that can store a complete branch of output nodes.

SAVE TEMPLATE

Next to the **Save** button is a text slate where you can enter a name for the template. The template saves the full branch 'after' (not including!) the current selected node, unless the selected node is the last in the branch. In that case only the selected node is included in the template. The name of the Template is added to the option list, next to the **Load** button.

Note: When you save a template and have not explicitly set the values of all properties of an output, the values in the template will remain undefined. When loading the template these properties will inherit the values of the parent/preceding node; e.g. if Format is not explicitly set before saving an output node as a template, then the newly created Output node from a loaded template will inherit the Format from the preceding Output node.

LOAD TEMPLATE

You can load and apply a template by first selecting the Output Node under which you want the new node/branch of nodes to be created. Next, you select the appropriate Template from the Option List next to the **Load** button. Last, you press the Load button itself.

Tip: Always check the settings of all of the newly created Output nodes; names and destination folders might have been changed from the template defaults to ensure uniqueness.

DELETE TEMPLATE

This button will remove the current selected template in the template option list.

OUTPUT NODE SETTINGS

The middle section of the Outputs menu contains various tabs with controls that apply to the currently selected output node. The first tab contains a number of generic settings that are available for all nodes. The Formats Settings and possible subsequent tabs vary depending on the exact type of the Output node; e.g. a QuickTime output requires you to select a specific codec for rendering the media. The last tab - Post Render, is available with all output nodes and allows you to specify an external program or script to be started after the rendering of the node complets.

OUTPUT SETTINGS TAB

In case an output node has been processed, the controls will be disabled to prevent accidental overriding of output files or changing only part of an output stream. In order to change the settings of an output node that has been processed, you first have to explicitly invalidate it or delete the underlying media.

Output Settings	Format Settings	Post Render			
Output	BWF Writer		BWF Writer.wav		
Media	D:\media\Render\				Browse..
	Format: HD 1080-24 ▼	Width	1920	Aspect Square 1:1 ▼	Framerate ▼
	Filter: Lanczos ▼	Height	1080	Scale	1.0000	24.000
	16 Bit (f) ▼ OpenEXR ▼	RGBA ▼ Lin/sRGB ▼	Apply	Progressive ▼	
		Timecode	00:00:00:00	Regenerate	
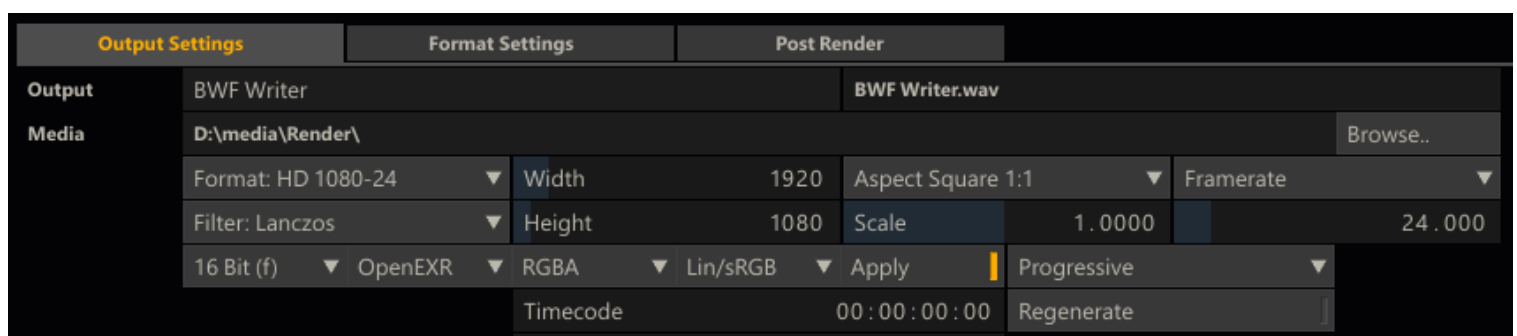
NODE NAME

The first Text Slate of the settings panel contains the name of the Output Node. You can change the name of any derived output. The name of default Main output is fixed and is the same as the name of the CONstruct. A new Output Node will inherit the name of its preceding (parent) Output Node in the Pipeline with a .Output postfix. For example, if the main output is called 'MyConstruct', a derived output from that will be called 'MyConstruct.Output'. This could be renamed to e.g. 'MyConstruct.HD' and any derived node from that will be default named 'MyConstruct.HD.Output'. If the name is not unique within the CONstruct, an increment is added at the end of the name to ensure that the name is indeed unique. The name of the node is, next to easy identification, used in setting the default for the location and name of processed output files.

FILENAME

The Filename Text Slate to the right of the Output Name has some special functionality. When you click on the text slate, a new dialog opens up where you can create a filename mask how frames will be processed out of SCRATCH.
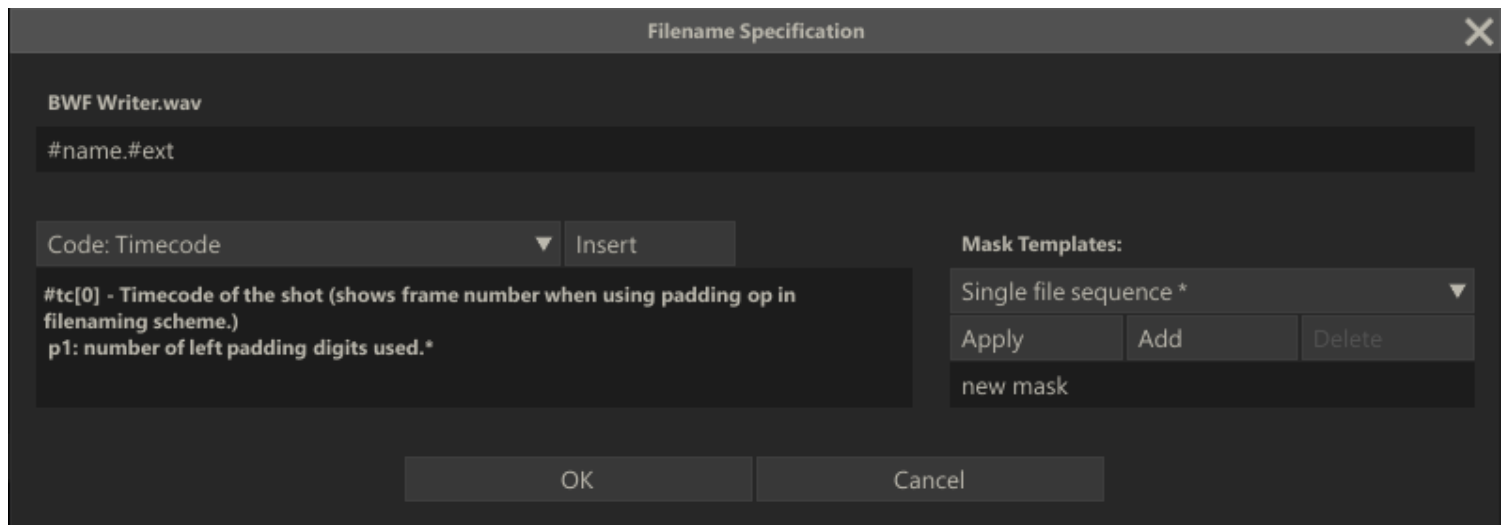
File-Mask

This dialog enables you to create a file mask, using various metadata of the underlying media and timeline, such as #sname (name of the source shot), #eventno (slot number) and #frame (frame number). The second line of the dialog shows the actual file mask while the top line shows the actual translation from the current mask, based on the current frame of the Output node. The Code option list provides all the codes that can be used in the file mask. When a code is selected, a description of it and any of its parameters are displayed in the label below the list. With the **Insert** button you can add the code to the file mask at the position of the text cursor. By adding one or more backslashes '****' you can spread the output over separate sub-folders.

Most of the available codes can also be used in the Burn-In plug for text overlays (discussed in more detail in Chapter 9 - PROCESS AND PLUG-INS). The list below displays all available codes. Those only available in the file-naming scheme are marked with [F], while those only available in the Burn-In plug-in with [T]. All others codes are available in both. Some codes have one or two additional parameters. The parameters are explained in the lines below the codes, annotated with '*P1:*'. The examples below the list show the usage of parameters.

- #reelid[0] - Reel ID of the input.
  - o p1:max number of characters (0 = all).
- #scene - Scene name of the shot.
- #take - Take name of the shot.
- #name - Name of the shot.
- #sname - Name of the source shot.
- #file - Filename of the shot (excluding extension). [T]
- #sfile - Filename of the source shot (excluding extension). Use #sfile[1] to preserve sequence digits in the original name.
- #note - Annotation stored with the shot. [T]
- #snote - Annotation stored with the source shot. [T]
- #tc[0] - Timecode of the shot. [F]
  - o p1: number of left padding digits used.
- #stc[0] - Timecode of the source shot. [F]
  - o p1: number of left padding digits used.
- #rtc - Record timecode. [T]
- #frame[6,0] - Frame number of the shot.

- o p1: number of left padding digits used.
    - o p2: frame number offset used.
- #sframe[6,0] - Frame number of the source shot.
    - o p1: number of left padding digits used.
    - o p2: frame number offset used.
- #seq_frame[1] - The current frame even/odd selection.
    - o p1: 1 returns single character 'L' / 'R', 2 returns 'Left' / 'Right'.
- #eventno[3,1] - The source event/shot number. [F]
    - o p1: number of left padding digits used.
    - o p2: event number offset used.
- #keycode - (Film) keycode of the shot
- #eventpos[6,1] - Frame position within the slot of the shot-frame. [F]
    - o p1: number of left padding digits used.
    - o p2: frame position offset used.
- #date[ymd] - The current system date. [T]
    - o p1: y-year m-month d-day number.
- #slotname - Name of the slot. [F]
- #spath - Path of the source shot excluding media folder or drive letter but including last folder separator.
- #fps - The frame rate of the shot in frames per second.
- #res - Resolution of the output eg. 1920x1080.
- #colorspace - Color space of the shot (lin, log, yuv).
- #ext - The default filename extension for the output format. [F]
- #project - Name of the project in which the output resides. [F]
- #group - Name of the group in which the output resides. [F]
- #construct - Name of the construct in which the output resides. [F]
- #md[a] - Metadata description. [T]
    - o p1: a valid metadata item code.
- #subtitle - The subtitle at the current time. [T]
- #soundroll - Sound Roll of the shot linked audio.
- #audiotc - Audio timecode of the shot

Below are a number of examples of file-masks using some of the codes from the list, together with the translated actual filename. For these examples we assume that the first shot on the timeline is named 'ShotX' and has reelID 'ABC'.

- myName#frame.#ext   -> myName000001.dpx
- myName#frame[3,2]   -> myName002.dpx
- #reelid_#sname_#frame.#ext   -> ABC_ShotX_000001.dpx
- myFolder\sub#eventno\img#frame.#ext -> myFolder\sub001\img000001.dpx
-

The first example shows that you can use any text of your own in the file mask alongside the hash tags. The second example shows the use of parameters. In the full list of codes the default values for each parameter is shown. Only when you need to use a different value you add the parameter values to the file mask. The third example shows that you can combine multiple codes in the file mask; there is no practical limit to the number of codes used. The final example shows the use of multiple sub-folders in the file mask. For sub-folders you can also use any of the available codes. Remember that the sub-folder path and filename is in the end added to the render path set for the Output node. So the final example might in the end become D:\Media\Render\myFolder\sub001\img000001.dpx.

Note: If a code does not have a value, e.g. not all slots have a name and you are using *#slotname* as code, this will translate to an empty string and might lead to error in the final rendering of the output.

Templates

The right half of the dialog allows for saving and loading of file masks as templates. After creating a file mask you can enter a name in the New Template text slate and click on the **Add** button. The current file mask is then stored with that name in the FileMasks.cfg file in the C:\ProgramData\Assimilator\Settings folder. All templates are listed in the option list above the **Apply** button. Selecting a template and clicking on **Apply** will load the corresponding file mask in the top text slate. Use the Delete button to remove a template from the list.

SCRATCH provides three default templates which are always present, cannot be removed nor stored in the FileMask.cfg. These templates are marked with an asterisk (*) in the Template list.

- Single file sequence » all rendered files are numbered based on the consecutive frame number.
- Separate folders » all rendered files are numbered based on the consecutive frame number, but grouped in folder per Slot.
- Folders and shotname + TC » rendered files are grouped in a folder per Slot with the filename containing the original Shot name and the timeline time-code.

Tip: You can load one of the default templates, customize that file mask by adding additional codes/characters and save that again as your own template.

Validation

After you entered a file mask and clicked on the **Ok** button, SCRATCH will check if the mask might result in duplicate filenames in the render. If that is the case a warning is displayed. For long renders the validation might take a couple of moments to complete.

MEDIA DESTINATION

The large text slate below the output name shows the destination path for images processed from the Output Node. By default, this path is the project's render directory followed by the name of the Output Node. If the resolution of the output differs from the project's resolution, the resolution is also added to the folder name. If that is not a unique path, an increment is added at the end of the path to ensure that the path is indeed unique.

The **BROWSE** button to the right of the text slate can be used to open a SCRATCH Browser where you can navigate to a new location for processed images.

Note: Once images have been processed into the destination folder, the BROWSE button changes to DELETE ALL. At this point, the destination path cannot be altered without first deleting any previously processed images. This is a safety mechanism to ensure that SCRATCH can properly track processed images and will not accidentally overwrite important data.

FORMAT

The Format pull-down operates in the same way as the Format button in the Project Settings Menu of the Startup Screen. This sets the working resolution for the Output Node. The values for the pull-down are read from the ImageFormats.cfg file.

FILTER

The Filter pull-down determines what type of filtering will be used when processing the Output Node. This filter is used for any scaling, translation or rotation operations that are made as part of the shot framing within the Process menu. For more information on shot framing, see Chapter 9 – PROCESS AND PLUG-INS.

The type of filtering determines how a pixel's value is altered, depending on the pixels surrounding it as the image is transformed. The range of the filter is derived from the amount of scaling applied to the image, except in Linear filtering where the filter size is constant.

SCRATCH filtering falls into three main groups:

Linear-type Filters

Linear filters use a constant slope value for the falloff within the filter range. These include: Linear, Box and Triangle filtering. The Linear filter can be done in real time by the NVIDIA graphics card.

Cubic-type Filters

Cubic filters use a standard cubic curve for the falloff within the filter range. These include: Cubic, Gaussian, Quadric and B-Spline. Cubic filters create generally softer results.

FIR-type Filters

Some filters use a method that is similar to a FIR, or Finite Impulse Response, filter in that they use a modified bell-shaped curve for the falloff within the filter range. Since the values for these curves can become negative, they have a sharper overall effect than the Cubic filters. These include; Sinc, Mitchell and Lanczos.

By default the Main Output node uses a **Linear** filter and any additional created (derived) Output nodes a **Lanczos** filter.

WIDTH

This Numerical Slate defines the horizontal working resolution of the selected Output Node in pixels.

HEIGHT

This Numerical Slate defines the vertical working resolution of the selected Output Node in pixels.

ASPECT

This pull-down determines the aspect ratio to be used for the selected Output Node. The values for the pull-down are read from the Aspects.cfg file.

Note: For details on setting proper aspect ratios and using the Scale parameter, see Chapter 3 - PROJECT SETTINGS MENU.

SCALE

The Scale is a manual control for custom aspect ratios.

FRAMERATE

This pull-down determines the frame rate for the selected Output Node. A specific number can also be entered directly into the Numerical Slate.

COLOR FORMAT

This pull-down allows you to set the bit depth that is used for the output files. The options are:

8 Bit

File formats using 8-bit values per color channel

10 Bit

File formats using 10-bit values per color channel

16 Bit (i)

File formats using 16-bit integer values per color channel

32 Bit (f)

File formats using 32-bit floating-point values per color channel

FILE FORMAT

SCRATCH can output in a variety of file formats. This pull-down allows you to set the file format that will be used for the output files. The options are:

DPX

The DPX file format is a real time optimized format that includes a file header, which stores metadata such as timecode, keycode, and other information about the file. DPX files typically use 10-bit values per color channel, but can also include 16-bit values.

Cineon

The Cineon file format is virtually identical to the DPX format except that it does not include a file header.

Tiff

The TIFF file format is widely used in animation and VFX applications. The TIFF file specification is quite broad and files can be formatted in a variety of ways, which may or may not be real-time playable.

JPEG

JPEG files are a compressed format that requires CPU processing in order for the files to be decoded into a format that SCRATCH can use. As a result, JPEG files may not be capable of real-time playback.

OpenEXR

OpenEXR is a common file format for saving multi-channel images. SCRATCH currently only reads the default image channel from OpenEXR. The OpenEXR file format is generally not optimized for real-time playback.

Targa

The Targa file format is also widely used in animation and VFX applications. Targa files may not play back in real time.

SGI

The SGI file format is still used by many 3D animation facilities. The SGI format is generally not a real time playable format due to the byte ordering of the files.

JPEG 2000

The JPEG2000 file format is used for DCI deliverables. It is a compressed format that requires CPU processing in order for the files to be decoded into a format SCRATCH can use.

RGB - RGBA

This button allows you to include or exclude the alpha channel in the output file. This is only available if the selected file format supports an alpha channel.

COLOR SPACE/ APPLY

Every node in SCRATCH has an associated color space: Lin/SRGB, Log/Film, Rec709, Ultra HD, P3 (XYZ), ACES, Wide Gamut, Scene Linear. This setting is used to determine the conversion to a specific output device or file. Setting a color space for an output node does not automatically imply conversion of input media to that color space; it just flags the output node as being in that color space which is used when the node is viewed or rendered to file. Only when you enable the **APPLY** setting next to the Color Space option, SCRATCH will do an automatically conversion of the input media to the color space set on the output if the two are not the same.

The other case in which SCRATCH will do an automatic color space conversion is when the color space of the node being viewed and color space of the monitor(s) as set in the Player are different. Please see for more information on the Monitor settings in Chapter 5 - The Player.

Note that each color space has its own associated gamma value / curve that will be used with a conversion from one space to the next. The default gamma for each of the available color spaces can be adjusted in the project settings in the startup module.

SCAN MODE

The Scan Mode determines whether the processed frames are Progressive or Interlaced.

Progressive

These image files are intended to be viewed on a progressive display system, where each line is drawn in order from the top of the image to the bottom.

Interlace F1

These image files are intended to be viewed on an interlaced display system, where all the odd numbered lines are drawn first, followed by the even numbered lines.

Interlace F2

The image files are intended to be viewed on an interlaced display system, where all the even numbered lines are drawn first, followed by the odd numbered lines.

Note: Once images have been processed into the destination folder, the buttons controlling the output format will be grayed out. This is to ensure that all images are processed with the same settings throughout the CONstruct. To modify any of these values, the processed media must be removed using the **DELETE ALL** button.

TIMECODE

The value set here is used as the starting timecode for the first frame of the selected Output Node. This is the timecode that will be written into the header of DPX files when the node is processed. By default the Output Node inherits the timecode from its inputs.

REGENERATE

This option will, when set, generate new timecode on output/processing rather than passing through the input time code.

RECORD TIMECODE

The Record Timecode can only be set for the Main Output Node of a CONstruct and determines the start time of the Timeline. The Record Timecode is displayed in the Player, showing the timeline position, and is (optionally) passed to the VCR in a Play-Out session. By default the timecode starts at zero.

FORMAT SETTINGS - TAB(S)

Depending on the type of output node - the Output view might display additional tabs with various settings. The different node types and node specific settings are discussed in more detail in Chapter 9 – PROCESS AND PLUG-INS.

POST RENDER TAB

Through the Post Render tab you can specify an external script or program that SCRATCH should execute after the rendering of an output node has completed. You first need to specify a Post Render Command - in the System Settings dialog. Chapter 11 - CUSTOMIZATION discusses in detail on how to create a Post Render command.

MULTIPLE MAIN OUTPUTS - STEREO

By default there is just one Main Output node. However you can create additional outputs at the top level / same level as the Main Output node. Note that these outputs will **NOT** include the outputs of any additional tracks you create in a multi-layer timeline setup. The primary purpose of the output nodes is to be able to render out left- and right eye separately (rather than in a stereo pattern) without having to change the settings of the Main output node after each render. For more information on rendering stereo footage see Chapter 9 – PROCESS AND PLUG-INS.

Note: Output nodes at the same level as the Main output node do **NOT** contain any sub-tracks you create in a multi-layer timeline setup!

PROCESSING OUTPUT NODES

Once you have setup your Output Nodes, you can start processing them. All processing is done through the Process Queue, which will process all nodes as efficiently as possible based on relations between the nodes, the order of adding them to the queue and any schedule for processing you might have set. To manage the Process Queue you can press the corresponding button on the main menu, which will pop up a dialog. Details on that dialog are discussed later in this chapter. In the Output Menu there are a number of buttons for basic processing control.
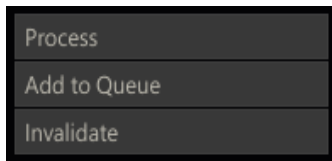
PROCESS

With this button you add the current selected Output Node to the Process Queue and start to process it. The text on the button will change to Abort. Clicking this button will stop the processing. Furthermore the proxy or icon in the Pipeline view will change; a disk icon is shown on top of the icon or proxy indicating that frames were processed for the node. Also, in case of the proxy view a progress bar in the proxy will show. Last, the proxy will show an image of the output when a number of frames have been processed.

Note: The disk icon will also appear in the Project tree with the current CONstruct, indicating that a node in the CONstruct is being processed.
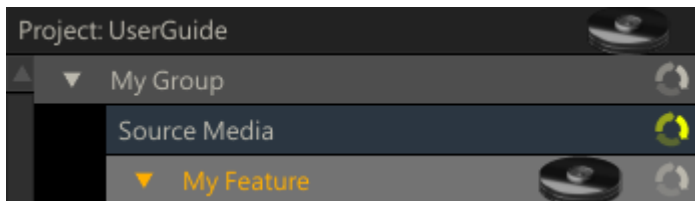
Note: When processing, all the settings controls will be disabled to prevent conflicting settings while processing.

ADD TO QUEUE

This button will add the selected Output Node to the Process Queue but it will not start processing. You can use this function to add multiple nodes to the queue and control/schedule processing from within the Process Queue dialog, discussed in detail later in this chapter.

Note: Adding an Output Node to the Process Queue does NOT make a copy. Any changes made to the node between adding it to the queue and processing it will end up in the final result.

INVALIDATE

Once an Output Node has been processed this button will invalidate the underlying media. This means that the media will not be deleted (for that use the Delete Media button, discussed previously) but if the Node is processed again, the media will be overridden.

09 - Trays

GENERAL

There are two types of Trays:

- Project Tray - group shots and are available from any CONstruct in a project. Project Trays can be used for e.g. making a sub-selection of timeline shots that you want to grade together using the SCRATCH color tools. Or hold a reference clip to compare it in a dual view setup against a conformed timeline.

- Gallery Tray - hold a library of single frame items that contain looks, grades and/or composite setups. Galleries are linked to a particular user and are available from any Project on a system. The Tray menu is available from within both the CONstruct and the Player.
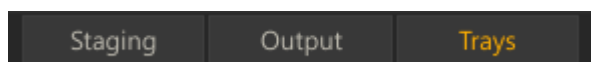
When Opening the Trays in the CONstruct, only the Project Trays are available. In Chapter 5 - The Player the Gallery Trays are discussed in more detail.

MANAGE THE PROJECT TRAY

Selecting Shots inside a Tray to move, to make a copy or to delete is done the same way as on the CONstruct. You cannot use the regular **Paste** button for placing Shots in a Tray though, as that is reserved for the CONstruct; to paste shots in the Tray use the **Add Reference** button.

NAME

You can have any number of groups in the Project Tray. Use the arrow option button to select a Tray Group. Select the **New..** option to create a new group and click the textslate to enter a name for the group.

ADD REFERENCE

You can also add shots using the Add Reference button. This will add the currently selected shots to the Tray. When shots are added to the Tray from the CONstruct this way, they create a live link in the Tray. The shots are not duplicated but rather the new **Reference Shot** in the Tray is a link back to the original shot, which remains in the CONstruct.

DRAG AND DROP SHOTS TO THE TRAY

Alternatively to the Add Reference button you can drag and drop shots from the CONstruct into a Project Tray.

DELETE SHOT

To remove a shot from the Tray, select the shot in the Tray area and click on Delete Selected. This will remove the currently selected shot from the Tray.

Note: Removing a shot from a Tray does not remove it from the CONstruct. Also, any color grading or other modifications that have been made will remain on the shot even after it is removed from the Tray.

DELETE GROUP

Delete the entire current Tray group.

COPY / DELETE SHOT

When selecting one or more shots in the Project Tray - similar as you do in the CONstruct - you can use the **Copy** and **Delete** buttons on the far right of the Tray menu. These buttons automatically apply to either the CONstrut or the Tray - depending on the current selection.

10 - Generic Functions

GENERAL

There are several interface elements that are available at all times when you are in the CONstruct.

COMMAND MENU

The Command Menu can be accessed by right-clicking anywhere in the CONstruct. The menu opens at the current cursor location.

• Quick Key: ` or ~	» Access the CONstruct Command Menu
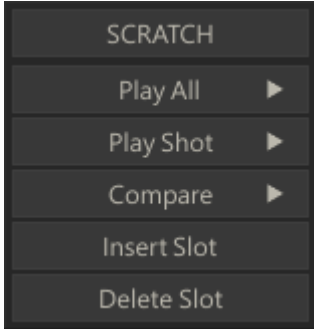
PLAY ALL

The Play All command loads the entire CONstruct into the SCRATCH Player. This is the same action as clicking on the center Play ▶ button on the Menu Bar.

• Quick Key: F1	» Load the entire CONstruct into the Player

PLAY SHOT

The Play Shot command loads only the shot that is under the cursor into the Player. If the Command Menu is opened when the cursor is not over a particular shot, this option will be disabled. The full shot is loaded into the Player with this command, regardless of any edit decisions applied to the shot within the CONstruct.

• Quick Key: Escape	» Load the shot under the cursor into the Player

---

COMPARE

You can use the Compare function to load a selection of shots from the CONstruct in the Player for comparison. To select multiple Shots hold down the Quick Key: Control and select the shots you want to compare. The selected shots are loaded into the Player in a single Slot, with each shot stacked in the Version Stack in the order they were selected. For more information on using the Player and the Version Stack, see Chapter 5 – THE PLAYER.

INSERT SLOT

This option inserts a new empty slot to the left of the cursor position.

DELETE SLOT

This option deletes the slot under the cursor. If the slot contains shots, you will be asked to confirm this deletion.

NAVIGATION CONTROLS

The Navigation Controls allow you to quickly pan through the CONstruct. The Navigation Controls do NOT change the slot is currently selected. They are simply a means for moving the CONstruct within the View Port.

FIRST SLOT

Pans the CONstruct to reveal the first slot of the Timeline.

PLAY

Loads the entire CONstruct into the Player. See Chapter 5 – THE PLAYER for details about entering the Player.

LAST SLOT

Pans the CONstruct to reveal the last slot of the Timeline.

NAVIGATION SLIDER

The area just below the Navigation Buttons is the Navigation Slider. The tick-marks in the Navigation Slider area represent individual slots within the CONstruct. The Slider within this area shows the portion of the CONstruct that is currently visible in the View Port. Moving the Slider left and right pans the View Port across the CONstruct. This is a quick way of navigating and having a sense of where you are within a large CONstruct.

You can also pan across the CONstruct, using the Quick Key: Spacebar and then clicking with the mouse and dragging left or right. By dragging and releasing the mouse, you can engage the Auto-Pan, which continues to pan the CONstruct in the direction you initially dragged. You can click anywhere in the CONstruct to stop the Auto-Pan.

Note: Using the Navigation Slider or Quick Key: Spacebar panning does not change the currently selected Slot. The slot selection remains the same, allowing you to view a different section of the CONstruct, while still preserving your currently selected slot.

The following Quick Keys are available for navigating the CONstruct:

• Quick Key: Spacebar and drag	» Pan across the CONstruct
• Quick Key: Spacebar, drag and release	» Auto-Pan across the CONstruct
• Quick Key: Right Arrow	» Reveal one slot to the right in the CONstruct
• Quick Key: Left Arrow	» Reveal one slot to the left in the CONstruct

CURRENT SLOT NUMBER

The Numerical Slate to the left of the Navigation Slider indicates the currently selected slot number. Slots are numbered from left to right starting either at zero or one, depending on the value set in the Settings Menu on the Start-up Screen. You can select a particular slot directly by clicking on the Slot Number Slate and entering a new value. The Slot Information Area for the selected slot is highlighted and the View Port automatically pans to that slot.

Tip: Use Control Gearing to change the Current Slot Number interactively.

TOTAL SLOT NUMBER

The Numerical Slate to the right of the Navigation Slider indicates the total number of slots in the current CONstruct. This value cannot be edited directly; it is generated automatically.

PROJECT BUTTONS

To the right of the Main Menu in the CONstuct there are a number of buttons for general project management.
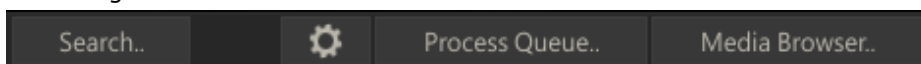
- The **Search** button will open a dialog for searching for shots in the project. The dialog is discussed in more detail later in this chapter.

- The button with the Gearing icon opens the Project **Configuration Settings** dialog, discussed below.

- The **Process Queue** button will open the Process Queue dialog with the status of (scheduled) output nodes. This function is discussed in detail in Chapter 9 - OUTPUT AND PROCESSING .

- The **Media Browser** button will open the Media Browser dialog, a tool to manage all the clips in the current project. The Media Browser is discussed in more detail later in this Chapter.

CONFIGURATION SETTINGS

The configuration Settings dialog is available from the CONstruct as well as from the Player.
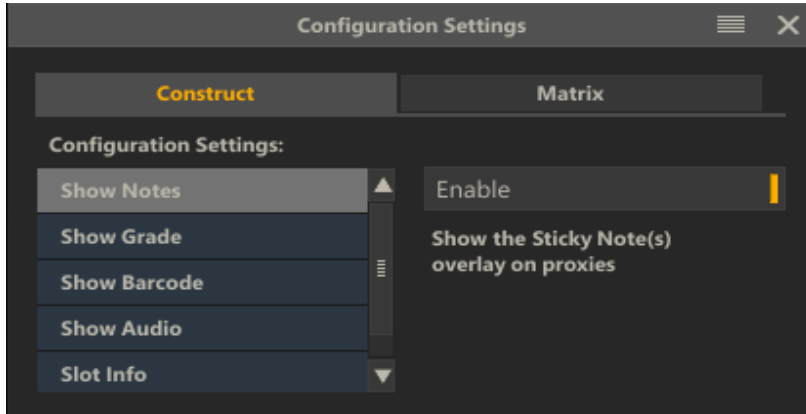
All the user settings that you can control are divided over two tabs: CONstruct and Player. Selecting a setting from the list will show the appropriate control to activate it on the right as well as a description of the setting.

• Quick Key: Z   » Open User Configuration Settings dialog

EVENT LOG

If SCRATCH detects a missing element (such as e.g. a LUT) when loading your project - it will popup the Event Log dialog to notify you. The log might also popup when e.g. a render fails to execute properly.
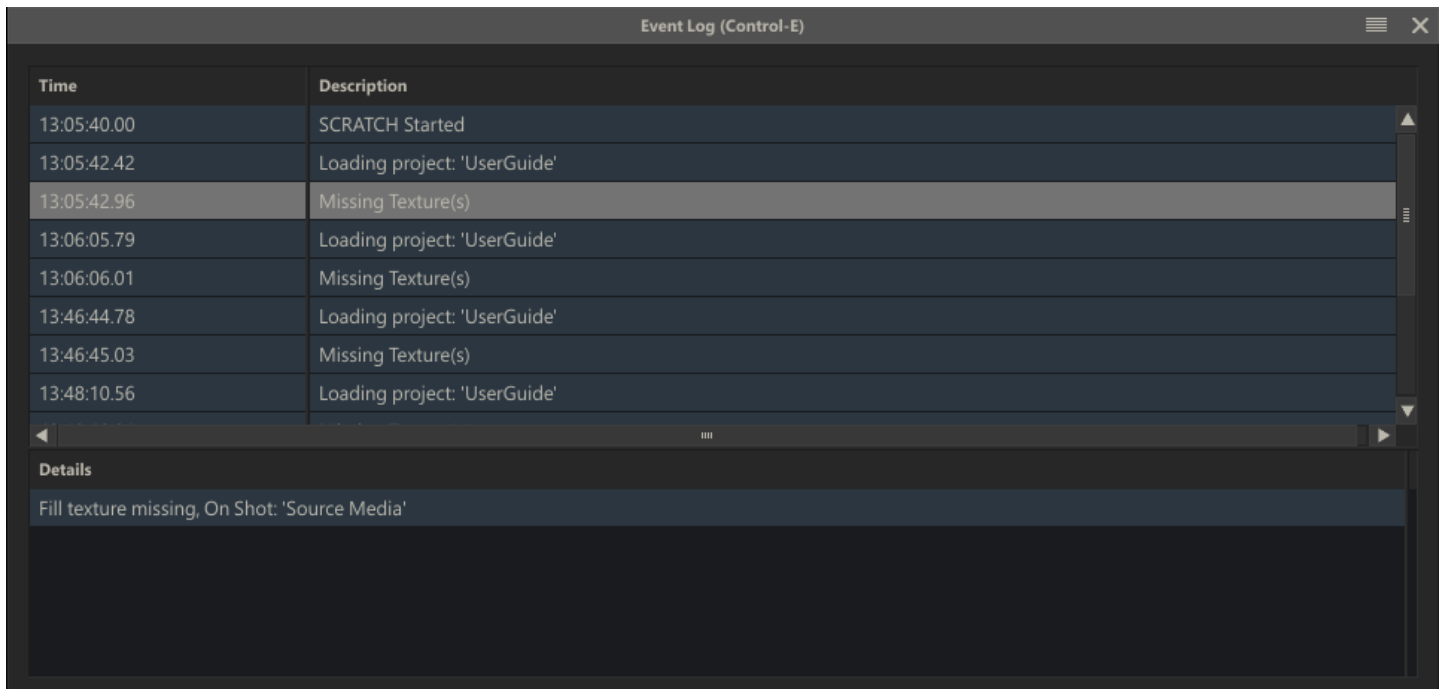
You can open the Event Log also yourself by using the appropriate quick key.

• Quick Key: CTRL + E   » Open the Event Log

EXITING AND REFRESHING THE PROJECT

On the left side of the menu panels are a number of buttons that are present all of the sub-menus except for the Tray menu.

EXIT PROJECT

The Exit Project button returns you to the SCRATCH Start-up Screen. This action requires a confirmation by clicking on OK. The status of the Project is saved so that the next time the Project is entered it will start up on the same CONstruct.

SAVE ALL

When the Save Mode is set to Manual in the User Settings Menu on the Startup Screen, an additional Save All button appears on the left side of the interface. Clicking on this button saves the state of all CONstructs in the current Project.

• Quick Key: Alt + S	» Save all CONstructs

REFRESH PROJECT

The Refresh Project button initiates a refresh of the current project. This is functionally the same as exiting the Project to the Start-up Screen and then re-entering the Project again. Refreshing the Project can be useful when you want to force any pending XML updates to occur immediately. For more information on working with XML in SCRATCH, see the XML section in Chapter 11 – CUSTOMIZING SCRATCH.

SHOT / SLOT BUTTONS

On the right side just below the Main Menu are four buttons that are present at all times (except when in the Output Menu) in the CONstruct: Copy .., Paste .., Delete .. and Delete Media.

COPY

The Copy button remains grayed out unless a shot, a slot or group of shots or slots have been selected. Once a selection has been made, the Copy button activates and changes its title depending on what is selected. If a single item has been selected in the CONstruct, Copy Selected is displayed. If multiple items have been selected, Copy Selection is displayed. Clicking on the Copy button copies the current selection into the Copy Buffer. The original items remain in their current location within the CONstruct.

PASTE

Once shots or slots are copied into the Copy Buffer, you can Paste them in another part of the CONstruct or a completely different CONstruct altogether. The Paste Shot/Slot button begins copying shots at the currently selected slot.

DELETE

The Delete button remains grayed out unless a shot, a slot or group of shots or slots have been selected. Once a selection has been made, the Delete button activates and changes its title depending on what is selected. If a single shot has been picked up in the CONstruct, Delete Shot is displayed. If multiple shots have been selected, Delete Selection is displayed. Clicking on the Delete button removes the selected shot or shots from the CONstruct.

DELETE MEDIA

Any time media is generated by SCRATCH, frames are stored in the designated output folder. The Delete Media button allows you to purge all of the processed frames from the current CONstruct. This does not delete original source images; only files that have been created as part of the SCRATCH processing of that CONstruct are affected.

Note: Normally you cannot delete source references directly from within SCRATCH. However, if Allow Delete Shot has been enabled in the User Settings Menu, the Delete Media button changes to [Delete Media & REF]. You will be able to delete both generated media and the original source references at the same time. This is potentially very destructive, so you must confirm this action by clicking OK after [Delete Media & REF] has been clicked.

UNDO AND REDO

SCRATCH maintains an Undo/Redo Stack per CONstruct. Each Stack has a maximum of 25 actions that can be undone. There are however a number of actions that cannot be undone or will clear the Stack. Conforming an EDL/ALE, switching between CONstruct Time-Slot and Free-Form modes cannot be undone. Exiting the project will also clear the Stack. Switching between CONstructs will preserve the undo stack of the individual CONstruct. The label below the Undo and Redo button contains a description of the action that is currently at the top of the Stack. Next to using the buttons there are also two quick keys available for undo and redo action.

• Quick Key: Ctrl + Z	» Undo the last action.
• Quick Key: Ctrl + Y	» Redo the last action that was undone

11 - Conforming

GENERAL

Once shots have been loaded into a SCRATCH Project, you can use an edit list to arrange the shots in the proper order and rebuild the Timeline. This process is called Conforming. SCRATCH can handle different formats edit lists:

- EDL - Edit Decision List - A standard text file that is generated from the offline system and provides SCRATCH with information about the source time code, name and/or reel-id for each shot in the timeline. It also provides a record time code that describes where the shot is located within the timeline.

- ALE - AVID Log Exchange - File format primarily focused on exchange of metadata rather than conforming a timeline.

- AAF - Advanced Authoring Format - An industry standard Edit Protocol that provides both (multi-layer) timeline and composite (image effects) information

- XML - Extensible Markup Language - This file format is exported by Apple's Final Cut Pro software. It can include multiple tracks and image filter/effect descriptions.

You use the **Load Conform** button on the Media menu to open an edit list. The button opens a SCRATCH Browser with which you can navigate to the location and select a conform file.

Note: By default the browser starts in the 'conform' folder within the current project folder. If you select a different folder, that folder will remain the default location for the current CONstruct.
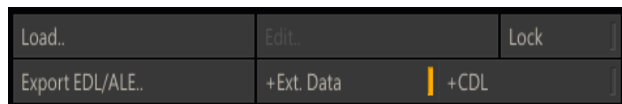
Depending on the selected file format a dialog will open showing the edit events or metadata. The dialog allows you to match the events with shots and assemble a new timeline.

EDL

An EDL conform uses a standard EDL text file that is generated from the offline system and provides SCRATCH with information about the source timecode, name and/or reel-id for each shot in the timeline. It also provides a record timecode that describes where the shot is located within the timeline. SCRATCH supports EDLs in the CMX 3600 format. A typical EDL will be formatted like this example:

```
TITLE: MY_SCRATCH_DI
FCM: NON-DROP FRAME

001 BL V C 00:00:00:00 00:00:10:00 01:00:00:00 01:00:10:00
FROM CLIP NAME: RPT-BLACK

002 STK01 V C 01:02:00:00 01:02:55:09 01:00:10:00 00:01:05:09
FROM CLIP NAME: ANIM_01

003 VT012 V C 12:02:19:11 12:02:38:04 00:01:05:09 00:01:24:02
FROM CLIP NAME: POE_09_v22
```

004 VT007 V C 07:02:51:02 07:02:57:08 00:01:24:02 00:01:30:08
FROM CLIP NAME: POE_11_v17

005 VT018 V C 18:03:16:03 18:03:23:18 00:01:30:08 00:01:37:23
FROM CLIP NAME: POE_15_v08

After selecting the EDL, SCRATCH will show the EDL Assembler window.

The Assembler provides control over the conform process as well as allowing you to edit the EDL to ensure a proper conform. The Assembler window has several sections.

EVENT GRID

The Event Grid displays every event in the EDL on its own line. Clicking a column header will sort the list based on that column's information. Clicking the same header again will reverse the sort from ascending to descending.

Note: The assemble and processing of the EDL is always done based on the EDL's Record time code regardless of the current sort order.

Reel-ID, Clip Name and Timecode can be edited by clicking on a cell in the selected row. Updated values are shown in yellow to identify changes from the original.

Reel	Shot Name
A004	A004_C329_0902S
A004	A004_C216_09013M
AX	A004_C220_09017S_

The Effects column shows clip transitions (Cut/Dissolve), vari-speed (FPS) and flip/flops (Mirror-Y/Mirror-X).

If an event has invalid timecode or zero length timecode, the row will show disabled. If an event has a gap in record time code with the preceding event, the time code will show red, as will the column header to indicate that there is a discontinuity within the EDL.

Record In
00:00:00:00
00:00:00:17
00:00:35:17
00:01:10:18
00:01:10:18

If data is lost because of timecodes conversion with the wrong frame rate, the row will show disabled and the frame rate button below the grid will show red to indicate that there is an issue within the EDL.

The Match column shows the properties of the best match:

- T = Timecode match
- R = Reel match
- N = Clip name match
- C = Reel/Name Cross match
- The number of matches is indicated by the value shown after the match indicators.

The following Quick Keys can be used in the Event Grid:

• Quick Key: Control + A	» Select all rows
• Quick Key: Control + D	» Deselect all rows
• Quick Key: Control + Left Mouse Click	» Add or remove row in selection
• Quick Key: Shift + Left Mouse Click	» Select all rows between selected row and current selection
• Quick Key: Spacebar + Left Mouse Click	» Pan through the Event Grid

EDIT CONTROLS

The Edit controls allow you to modify the current EDL using the following commands:

Reset events

Reset the selected events to their default values.

Insert event

Add a new EDL event before the currently selected event. The new event has a Source Timecode of zero, so initially the row will be shown disabled. The Record Timecode of the new event will match the outgoing timecode of the preceding event and the incoming timecode of the next event.

Delete events

Delete all selected events.

Ripple TC

When active, this will ripple the record timecode on all events after the current event. An increase of the outgoing timecode of the current event will update in- and out- record timecode of all events after. Before increasing the timecode of the next event, first any existing gaps between the outgoing timecode of an event and the incoming timecode of the next event will be closed.

Fit record

Updates the record timecode of selected event to match the record in- and out- of events before and after the selected event. This is used to automatically fill any record discontinuities in the timeline by extending the selected event to fill in the discontinuity.

Frame rate

Sets the frame rate for the EDL. When changing the frame rate, all the original timecodes from the EDL will be converted. When the conversion causes a loss of data, the event will show as disabled and the frame rate button will appear red. If the EDL is assembled to a new CONstruct, the frame rate will be set as the default for that CONstruct.

Offset and Apply on Source

Add an offset to the source timecode of all selected events. The offset will be added to both the in- and out- timecodes.

MATCHING OPTIONS

At the core of the assemble process is the matching process between the events in the EDL and the shots loaded in SCRATCH. The process will compare the source in- and out- points of an event and shot and determine if there is an match/overlap. The process will also compare shot name and reel-ID of the event and a shot, as well as check whether the shot name of the event matches the reel-ID of a shot. The process might find zero, one or more matching shots. If more than one matching shot is found, SCRATCH will sort the matches giving preference to clips that have been graded and clips that are currently on or closer to the timeline in the source CONstruct. There are a number of controls to adjust this matching process to your specific situation.

Match from...

Determines the location where SCRATCH will search for matching shots. The available options are: CONstruct, Group or Project.

Match TC

Source shots must have a timecode overlap with the EDL event to successfully match. If switched off, the overlap will still be used for ranking multiple matches.

Match Reel

The source shot's reel-ID must match with the EDL tape-ID to successfully match. If switched off, the match will still be used for ranking multiple matches.

Match Name

The source shot's clip name must match with the From Clip Name comment in the EDL to successfully match. If switched off, the match will still be used for ranking multiple matches.

Match Cross

Either the source shot's reel-ID must match with the From Clip Name comment in the EDL or vice versa to successfully match. If switched off, the match will still be used for ranking multiple matches.

Resolve Metadata

If the scope (Match argument) selected is either Group or Project, the Resolve Metadata button will become available. Enabling this button will force SCRATCH to reload the timecode and length of an potential match. These might have changed if the physical media was overwritten with new files from e.g. a new film scan. For efficiency, SCRATCH explicitly only

reloads the metadata of the current CONstruct. So the shots on CONstructs that have not been opened yet in the SCRATCH session have not been explicitly been updated. Remember though, this only applies when the external media of existing shots has been overwritten.

Reverse Assemble

This feature is used for splitting a single clip into several events using the Record In and Out points from the current EDL. All events are matched with the first clip on the current CONstruct and assembled accordingly. The Offset value allows you to set a difference between the source clip's timecode and the Record timecode in the EDL in order to get a correct assemble.

Start Matching (All)

This button starts the matching process, using the match options set. If the [All] button is enabled, the process will process all events, starting with the topmost event which was not processed yet. If the [All] button is disabled then only the current event is processed. Once the matching process is started, the function of this button will change to **Abort** the process and a progress indicator will appear at the right of the button. You can stop the matching process at any time. You can also change the match options during the process, this will cause all events processed so far to be re-matched based on the new options. The matching process will not remove any previously matched clips from the list, even if they are not compatible with the new matching options.

Note: When changing the match properties, already found matching clips will not be removed from the list but remain as valid matches. This way you can gradually relax matching criteria or expand the matching domain (project, group, construct) without losing already matched clips. Matches are ranked (see below).

Clear Matches (All)

This button will clear the list of matching clips of the current selected event or, in case the [All] button is enabled, of all events in the EDL. This way you can start a new, clean matching process based on current matching options.

ASSEMBLE OPTIONS

To New CONstruct

When active, the EDL will be assembled into a new CONstruct. When inactive, the EDL will be assembled into the current CONstruct. When assembling to the current CONstruct, if the current CONstruct has a different frame rate than selected in the Assembler, a warning will be displayed next to the CONstruct text slate showing the frame rate mismatch in red. You can still assemble to the current CONstruct which has the different frame rate. The Record timecodes in the EDL, which are used to set the slot length, are converted to the frame rate of the current CONstruct. The matching algorithm and source timecodes remain unchanged. The newly assembled clips will be placed at the bottom of each slot's layer stack and any existing clips will be pushed up in the layer stack.

When assembling to a new CONstruct, the default name for a new CONstruct is the name of the EDL file. You can modify this by typing a new name in the text slate below the To New CONstruct button.

Incl. Duplicates

When this button is active all matches will be added to the new conform. This allows you to bring any matching clips into the new CONstruct in case there is a need to examine the matches more closely to determine which version to use.

Delete Empty Slots
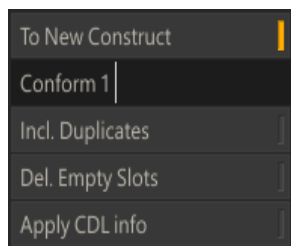
When active, any events in the EDL which have no matching clips will not be created in the final assemble. When disabled, an empty slot of the proper duration will be created in the final assemble to hold the place of the unmatched event or for any record timecode gaps that are present.

Note: Timecode gaps in a Reverse Assemble are automatically filled.

Apply CDL Info

An EDL may contain ASC CDL (Color Decision List) information. If so, SCRATCH will parse that information and with the Apply CDL button you can translates and apply the info to the SCRATCH color pipeline of a shot. The CDL information in an EDL is included in the comment lines with either a *ASC_SOP* (Slip Offset Power) or *ASC_SAT* (Saturation) keyword at the beginning of the line and (if applicable) the values split into RGB (red, green, blue) values like this:

* ASC_SOP = (1.000000 1.000000 1.000000) (0.000000 0.000000 0.000000) (1.000000 1.000000 1.000000)
* ASC_SAT = (1.000000)

The ASC CDL parameter mapping to the SCRATCH color pipeline is implemented as follows:

```
ASC CDL    -> SCRATCH
Slope      -> Pre-Gain (r,g,b)
Offset     -> Offset (r,g,b)
Power      -> Gamma (r,g,b)
Saturation -> Color-B Saturation
```

Assemble

Perform the assemble and close the Assembler.

Close

Closes the Assembler without performing an assemble. The state of the Assembler is preserved as long as you remain in the current project and you do not click the Clear EDL button. The EDL can be opened from a different CONstruct. This way an EDL can be matched with specific CONstructs in different Groups.

MATCHING CLIPS

The section on the right side of the Assembler shows any matching clips for the selected event in the EDL. The clip on the bottom of the stack is initially the best match. The matching routine ranks possible matches. The ranking is based on timecode, Reel-ID and Clip name – favoring the clip that has grading and favoring the clip closest to the timeline, i.e. bottom of the version stack.

You can select a clip in the stack and use the arrow buttons just below the Matching Clip window to change the order of the clips. The label at the top of the window will change to yellow to show that the order has been altered from the original match. Whichever clip is on the bottom of the stack is the one that will be used in the assemble.

You can click on the **Nt.** button to toggle the sticky notes on and off for the matching clips, which can be used to further identify the proper clip for a conform. The **Delete Match** button can be used to remove a selected clip from the Matching Clips window. The removed clip will no longer be used in the assemble for that event. The current location of the selected matching clip is shown below the Matching Clips window and includes the source Group, CONstruct, Slot and Version position.

ALE IMPORT

The ALE (AVID Log Exchange) Import dialog allows you to import meta-data and (optionally) conform a new Timeline. An ALE is a text file with a header section and a tab-separated data section. The exact specifications of an ALE is publically available on the AVID website www.avid.com. Even though importing an ALE has a lot in common with processing an EDL, it has some specific functions.
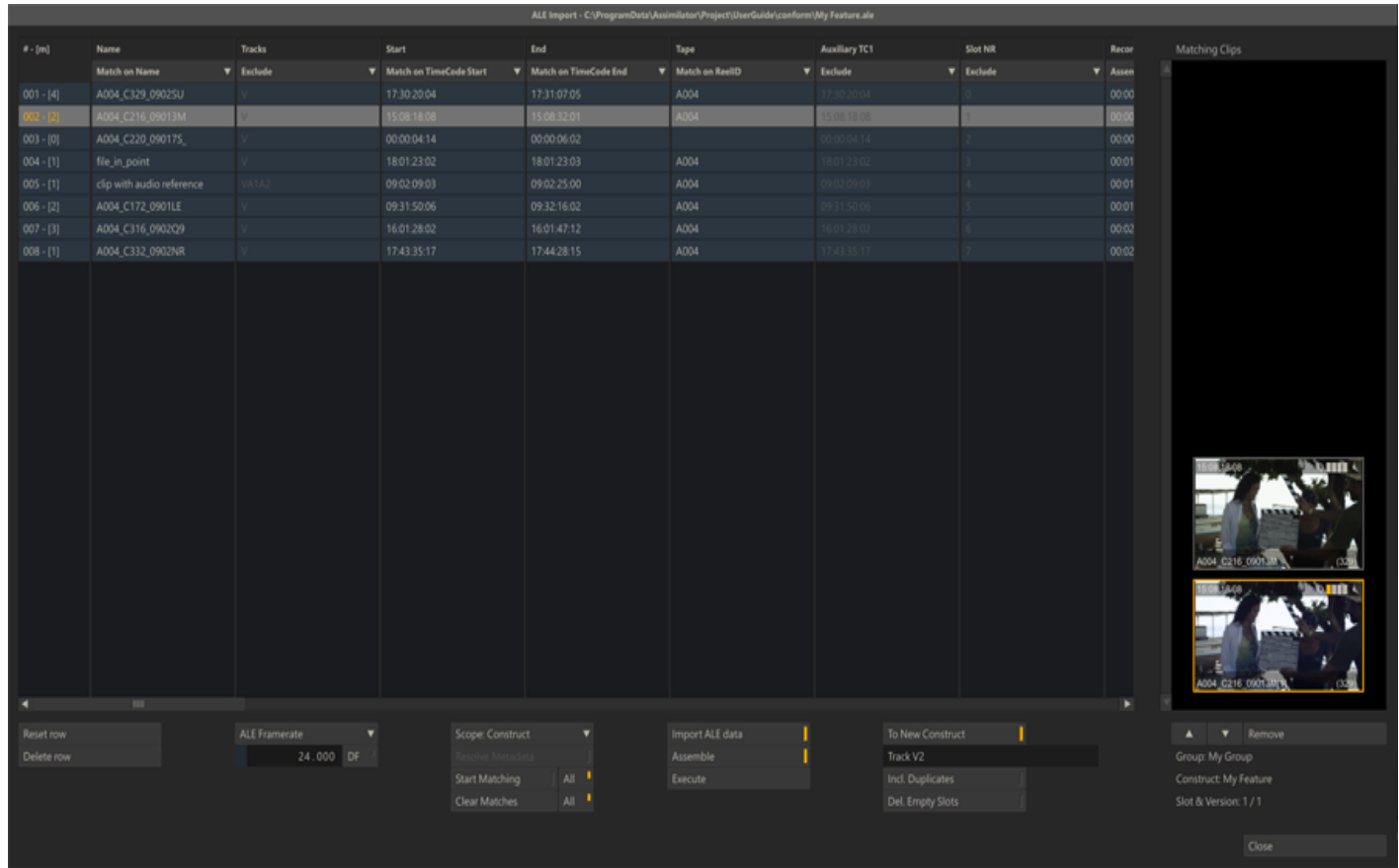
Processing an ALE is a three step process:

- Load the file and link the data-columns in the file to set the usage of each data-column

- Match the ALE entries with shots in the SCRATCH project

- Either import the metadata, conform a new timeline or do both

SET COLUMN USAGE

All the data in an ALE is presented in a grid in the dialog. The first row of the grid shows the name of each column. By clicking on the second row a option list appears; allowing you to change the usage of the column in the ALE processing function.

Match on ReelID	Import as Scene
Match on Name	Import as Take
Match on TimeCode Start	Import as TimeCode
Match on TimeCode End	Import as Audio TC
Assemble on Record TC Start	Import as Sound Role
Assemble on Record TC End	Import ASC_SOP
Assemble on Record Length	Import ASC_SAT
Import as ReelID	Import
Import as Name	Exclude

Each column is either:

- Used in the matching process through the Match.. options

- Used for assembling of a new timeline through the Assemble.. options

- Imported to update a specific shot property through the Import as.. options

- Imported to update the color pipeline settings. Select one of the Import ASC.. options

- Imported to update or added as a general metadata item in the name-value list of a shot. Select the plain Import option

- Excluded from the ALE process through the Exclude option

If an ALE includes a column that is called e.g. *shotName* and you would like to use that for matching the ALE events with the shots in the project, you need to select the *Match on Name* option. If you want to use this column to update the name property of the shots in your project with (while matching on other criteria), you would select the *Import as Name* option. In case you do not want to use this column for either matching or updating the name property of shots, you select the *Exclude* option.

The first time you load an ALE a AleDefaults.xml file is created in the C:\ProgramData\Assimilator\Settings folder which holds a number of default column usages. The file links column names to any of the possible usages SCRATCH has. If e.g. your ALE files always contain a column 'shotRL' and you want to always use that column for matching on the reel-id, you can edit the AleDefaults.xml file:

<match_reelid>**ShotRL**;Reel ID;Tracks;</match_reelid>

This will only set the default usage for the column. In the ALE Import dialog you can still select any other usage.

MATCHING OPTIONS

The matching procedure for an ALE is very much similar to that of an EDL. The criteria on which the match is based on have been set by updating the column usage options. There must be at least one column with a *Match*-option set.

Reset Row

When you click on a cell in the grid of the dialog, it will switch into edit mode allowing you to update the content. After updating, the text in the cell will show colored. The Reset Row button allows you to revert any changes you made to the selected rows.

Delete Row

This button will remove all selected rows in the ALE grid.

Scope

This button allows you to set the scope SCRATCH will use in the matching process. The options are CONstruct, Group or Project. If CONstruct is selected, SCRATCH will only check the current selected CONstruct for any matches. If Project is selected, SCRATCH will consider all shots in the project as potential matches.

Resolve Metadata

If the scope selected is either Group or Project, the Resolve Metadata button will become available. Enabling this button will force SCRATCH to reload the timecode and length of an potential match. These might have changed if the physical media was overwritten with new files from e.g. a new film scan. For efficiency, SCRATCH only explicitly reloads the metadata of the current CONstruct. So the shots on CONstructs that have not been opened yet in the SCRATCH session have not been explicitly been updated. Remember though, this only applies when the external media of existing shots has been overwritten.

Start Matching (All)

This button starts the matching process, using the match options set. If the [All] button is enabled, the process will process all events, starting with the topmost event which was not processed yet. If the [All] button is disabled then only the current event is processed. Once the matching process is started, the function of this button will change to **Abort** the process and a progress indicator appears at the right of the button. You can stop the matching process at any time by clicking this button. You can also change the match options during the process; in that case all events processed so far will be re-matched based on the new options. The matching process will not remove any previously matched clips from the list, even if they are not compatible with the new matching options.

Note: When changing the match properties, already found matching clips will not be removed from the list but remain as valid matches. This way you can gradually relax matching criteria or expand the matching domain (project, group, construct) without losing already matched clips; matches are ranked (see below).

Clear Matches (All)

This button will clear the list of matching clips of the current selected event or, in case the [All] button is enabled, of all events in the EDL. This way you can start a new, clean matching process based on current matching options.

MATCHING CLIPS

The right side of the ALE Import dialog is used to show thumbnail images of the matches found, just like in the EDL Manager dialog. You can select any of the matches by clicking on the thumbnail. The labels underneath will display the location of the match found; group, CONstruct, slot and/or version index. With the **Arrow** buttons just below the list you can change the order of the matches. The bottom match will be the timeline shot if you assemble a new timeline. Finally, the **Delete Match** button allows you to remove the selected match from the list.

The first column of the ALE data grid will also show the number of matches found for each ALE event; a - [n] label is added after the row number, where *n* is the number of matches found.

IMPORT AND CONFORM OPTIONS

The ALE Import dialog allows you to only import metadata, conform a new timeline based on the ALE, or do both.

Import ALE Data

Enabling this button will, when the Execute button is used, import the ALE data into the matching shots

Assemble

Enabling this button will, when the Execute button is used, assembles a new timeline. When enabling this button, the Assemble options to the right of this button are also enabled.

Execute

Start the actual Import and/or Assemble process.

To New CONstruct

Similar to the EDL Manager, when active, the ALE will be assembled into a new CONstruct. When inactive, the ALE will be assembled into the current CONstruct. When assembling to the current CONstruct, if the current CONstruct has a different frame rate than selected in the Assembler, a warning will be displayed next to the CONstruct text slate showing the frame rate mismatch in red. You can still assemble to the current CONstruct which has the different frame rate. The record timecodes in the ALE, which are used to set the slot length, are converted to the frame rate of the current CONstruct. The matching algorithm and source timecodes remain unchanged. The newly assembled clips will be placed at the bottom of each slot's layer stack and any existing clips will be pushed up in the layer stack.

When assembling to a new CONstruct, the default name for a new CONstruct is the name of the ALE file. You can modify this by typing a new name in the text slate below the To New CONstruct button.

Incl. Duplicates

When this button is active all matches will be added to the new conform. This allows you to bring any matching clips into the new CONstruct in case there is a need to examine the matches more closely to determine which version to use.

Delete Empty Slots

When active, any events in the ALE which have no matching clips will not be created in the final assemble. When disabled, an empty slot of the proper duration will be created in the final assemble to hold the place of the unmatched event or for any record timecode gaps that are present.

Close

Closes the ALE Import dialog. The state of the ALE Import is preserved as long as you remain in the current project and you do not click the Clear ALE button. The ALE can be opened from a different CONstruct. This way an ALE can be matched with specific CONstructs in different Groups.

AAF & XML

When you open either an Advanced Authoring Format or a Final Cut Pro exported XML file the following dialog will open.
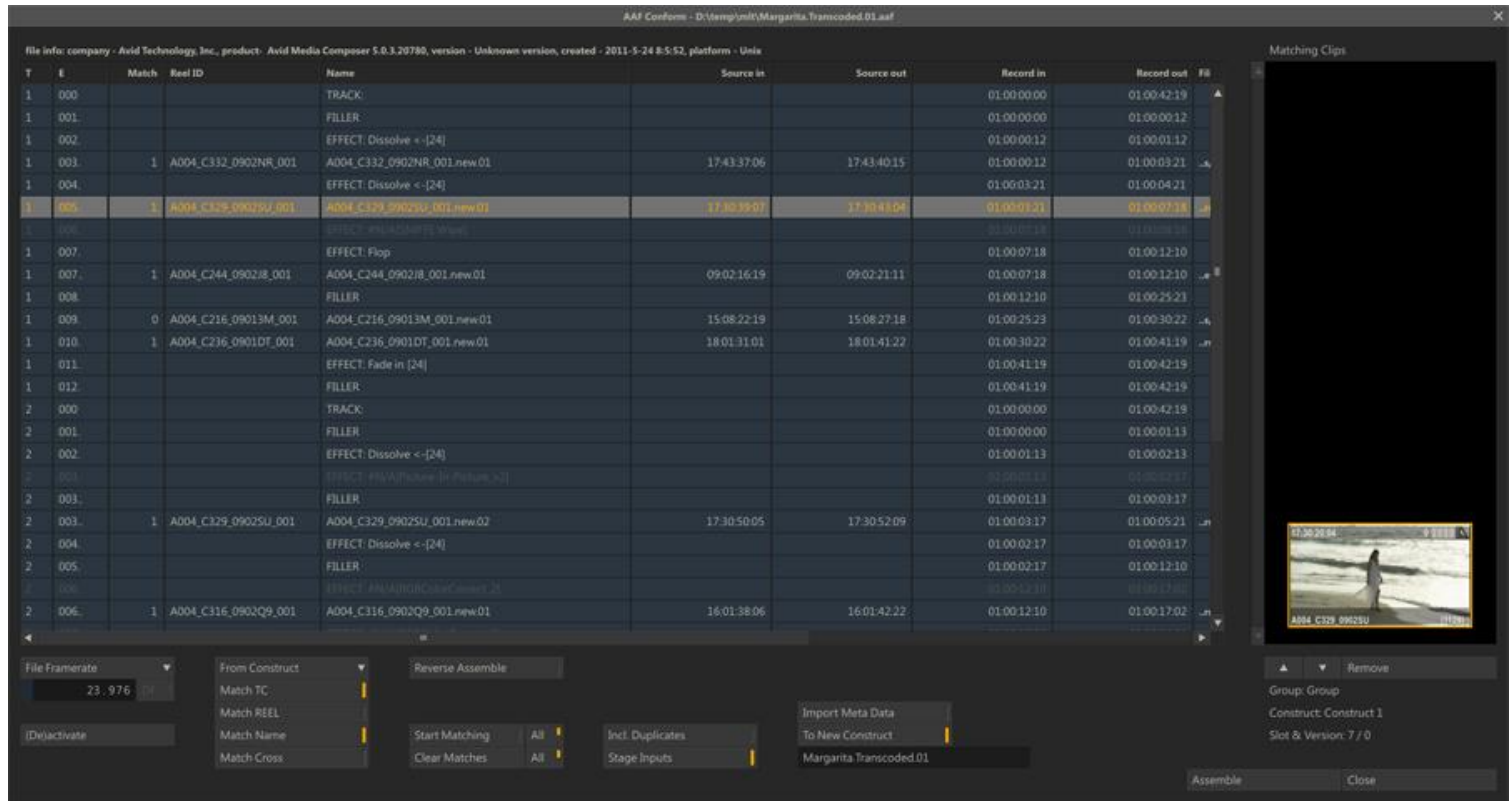
GENERAL

The dialog is very similar to that for an EDL and ALE but there are a number of important differences.

• An AAF or XML can contain multiple tracks; the first column in the data grid shows the Track of the event.

• The Edit events of an AAF or XML are hierarchically linked: At the lowest level there are one or more Tracks, Shots can have multiple filters/effects applied to them. The second column of the data-grid shows the event number as well as the hierarchy level.

• Only shot-events have a source-timecode. Track-, Filler- or Effect-events do not.

• SCRATCH does not support all effects/filters that can be included in the AAF or XML. Unsupported events are displayed disabled and cannot be enabled manually. Current supported effects are: Scaling, Offset, Vari-Speed, Dissolves and Flip/Flops. SCRATCH does include all the inputs of non-supported effects on an Assemble and it will display an annotation with the name of the missing effect.

• The grid's contents are not editable; you cannot change the naming or the timecodes (as that might brake the hierarchy).

• The tenth column displays the file reference of a shot if available in the conform file. This file reference can be used for searching directly in a directory for matching shots, rather than matching with clips already loaded in SCRATCH.

• The Metadata column displays the number of name-value pairs available in the conform file (AAF only). This data can be imported using the corresponding button below the grid.

• The last column in the data-grid is reserved for future use.

Frame rate

Displays, when available, the frame rate from the conform file. Otherwise the frame rate of the current CONstruct is displayed. The button allows you to override the frame rate used for matching events with SCRATCH clips. When changing the frame rate, all the original time codes from the conform file are converted.

(De)activate

Allows you to deactivate or activate selected events. Deactivated events are not matched and not included in the final assemble. This can be useful if you e.g. want to exclude certain effects or a whole track etc.. When deactivating an event all underlying events will automatically be deactivated too. Events that are deactivated by SCRATCH (such as unsupported effects) can not be activated.

MATCHING OPTIONS

Similar to the EDL matching procedure discussed earlier in this chapter, you can choose the **Scope** where SCRATCH will search for matching clips and the criteria for matching: Match Timecode, match on Reel-ID, match on Clip Name or match the Event Reel-ID with the Clip Name (or vice versa) using the **Cross** option. The AAF/XML conform has an additional match option: From **Folder**.
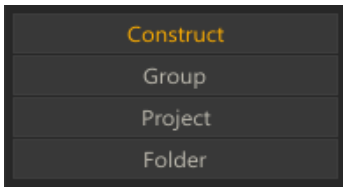
Folder

When selecting the From Folder option all criteria buttons are disabled and two additional controls become available: select a folder on disk and set the media type to search for.
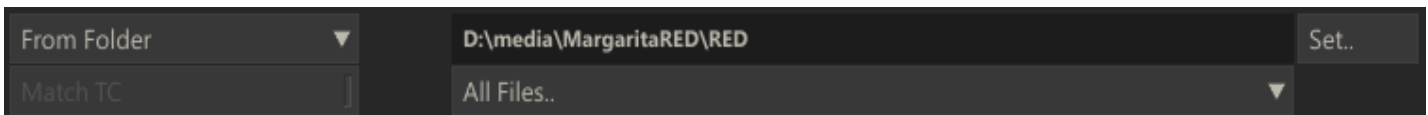
The From Folder option uses:

- The file reference of the event as displayed in the tenth column. The file reference is stripped of the folder info and the extension.

- The selected folder is search recursively, meaning that all sub-folders are included.

Note that the search from folder might take some time - depending on the size of the folder and sub-folder, the number of matches and the speed of the disk you are searching on. Setting a specific media type increases search / match efficiency and performance. After the match process has finished you can select a different folder to find additional matches.

Match

The Match buttons - Start, Stop and Clear - behave the same as discussed for the EDL conform earlier in this chapter. Next to the Start Matching button a progress indicator is displayed when the matching process is active.

Reverse Assemble

This option will - similar to an EDL conform - use the clip in the first slot of the current CONstruct as a match for all events. However, in addition if the AAF contains different tracks the Assemble will look for additional shots on the current CONstruct; the shot in the second slot will be used to reverse-assemble events on the second track, the shot in the third slot for events in the third track and so on.

MATCHING CLIPS

The right part of the dialog is used for displaying matching clips - similar as for the EDL and ALE conform discussed earlier in this chapter. There is a difference however in that the AAF/XML conform will only include the best/bottom match in the final assemble.

ASSEMBLE

Similar to the EDL conform you can assemble to the current or a new CONstruct. An AAF or XML can have multiple tracks, which are assembled to multiple sub-CONstructs/Tracks. After a successful assemble the dialog is closed and the new CONstruct is selected. If however errors occurred during the assemble the dialog remains open. The top line above the data-grid with the conform info is displayed in red as are the first column event numbers of the events that caused the errors. The **Assemble** button is disabled to prevent the assembling again to the same CONstruct inadvertently. To enable the

Assemble button again you must close the dialog and reopen it by using the **Edit Conform** button in the Media menu. Before doing another assemble you first should inspect the failed events and possibly deactivate them.

Include Duplicates

This option will put any additional matches as version in the corresponding slot.

Stage Inputs

If SCRATCH encounters an (unsupported) effect with (multiple) inputs this option allows you to have the inputs placed in the staging area of the main input.

Import Meta Data

With an AAF conform you can optionally import and link all available meta-data (name-value pairs) to the matched shot.

12 - Media Browser

GENERAL

The Media Browser displays a list of all Shots in the current project and allows for easy searching, sorting, filtering of clips as well as the ability to modify the properties of multiple clips at once. The Media Browser is opened with the corresponding button on the main menu bar of the CONstruct.
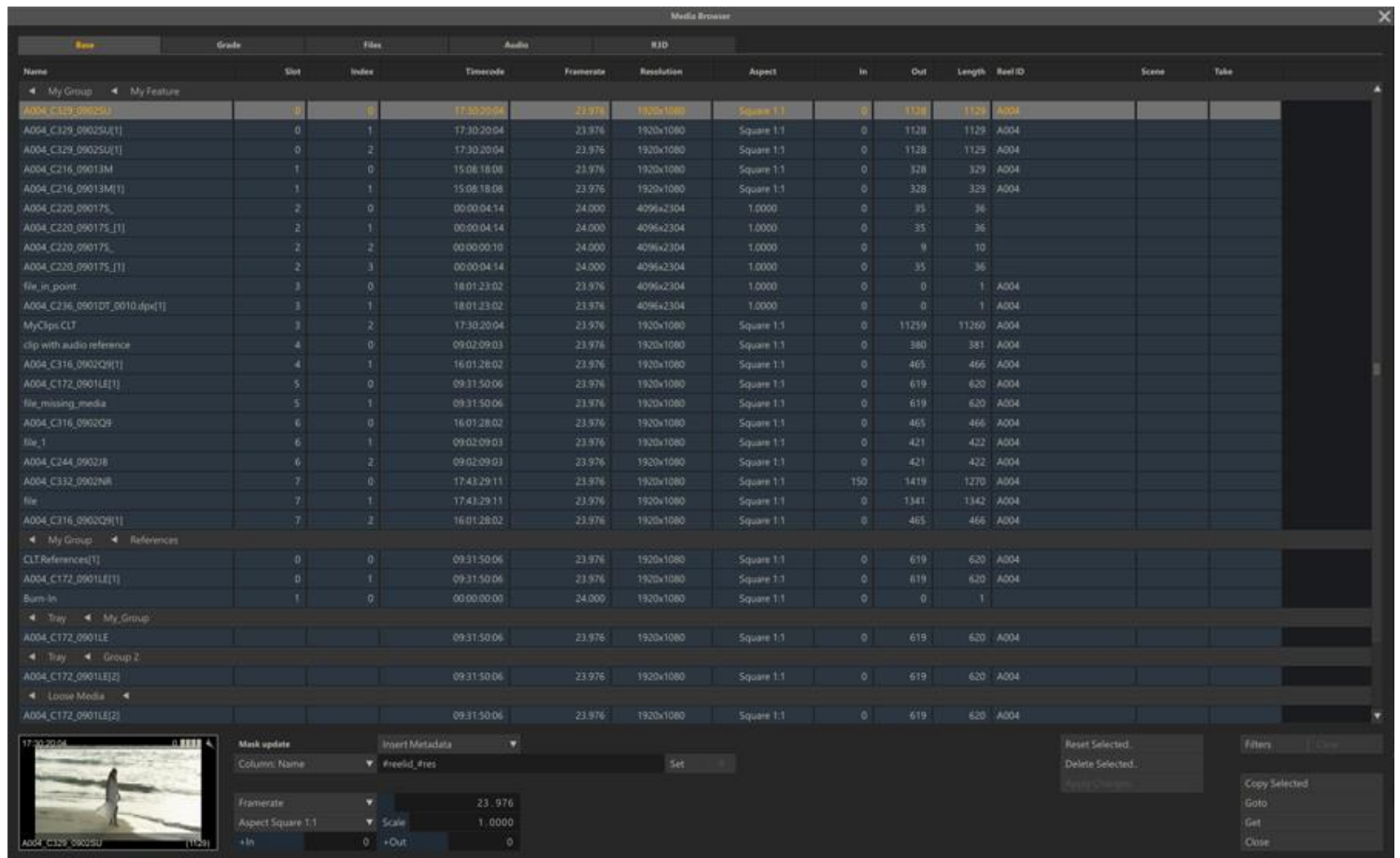
The Media Browser has a number of different views which can be activated by the tab-controls at the top of the dialog: Base, Grade, Files, Audio and R3D. In addition to the common functions of the Media Browser, each of these Views display additional specific aspects of the media and offer functions to manipulate them.

COMMON FUNCTIONS

DATA GRID

The Data Grid displays the list of shots given the active filters and sort. The first four columns shown are the same for all views: *Name* of the shot, the *Slot-* and *Layer-index* where the shot resides and the shot's *time-code*. Initially, the grid shows all shots in the project, grouped per Project-Group and CONstruct. This grouping is shown through the raised grid rows (Grouping Bars) with the name of the Group and CONstruct.

The grid can be sorted by clicking on one of the column headers. This will remove the grouping per CONstruct. Clicking the same column header again will sort the grid in descending order. Clicking a third time will remove the sort and revert back to the grouping.

The Grouping Bars can be used to filter out other shots. Clicking on the CONstruct name in a bar will hide any shot in the filter that is not on the particular CONstruct. The arrow on the Grouping Bar next to the name of the CONstruct will point down. Clicking the CONstruct name again will remove the filter and show all shots again.

When a single shot is selected in the Media Browser, a thumbnail image of that shot is shown in the lower left corner of the dialog. The thumbnail image can be used to display and change any sticky notes for the clip using the Quick Key: A to open the editor and Quick Key: S to show the notes. When multiple rows are selected, no thumbnail is displayed.

There are a number of Quick Keys that can be used in the Grid:

• Quick Key: Control + A	» Select all rows
• Quick Key: Control + D	» Deselect all rows
• Quick Key: Control + Left Mouse Click	» Add or remove row in selection
• Quick Key: Shift + Left Mouse Click	» Select all rows between selected row and current selection
• Quick Key: Spacebar + Left Click and Drag	» Pan through the Event Grid

Note: Not all grid columns are visible at the same time; use the bottom scrollbar to view non-visible columns.

FILTER AND SEARCH

Next to the basic filter functionality offered through the grouping bars, the Media Browser offers a more extensive filter and search function. Clicking the **Filter** button at the bottom left of the dialog will display an additional row of control above the Grid.
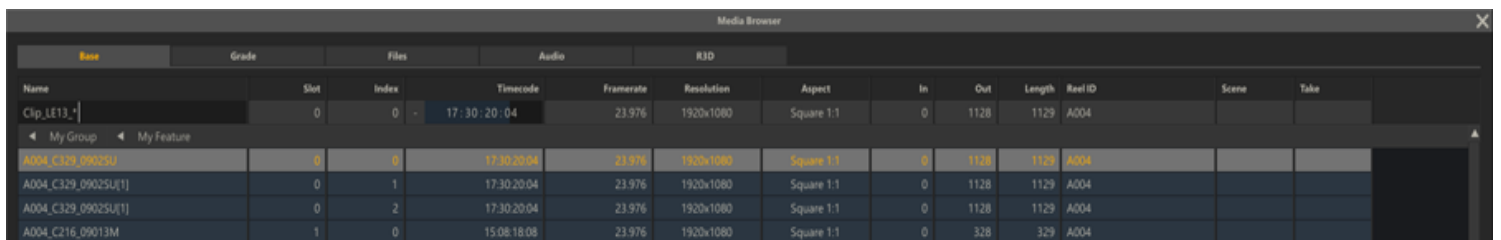
Depending on the column type you can enter a value which is used to filter shots. A column with text-values will also allow the use of *wildcards* (*,?,[]).
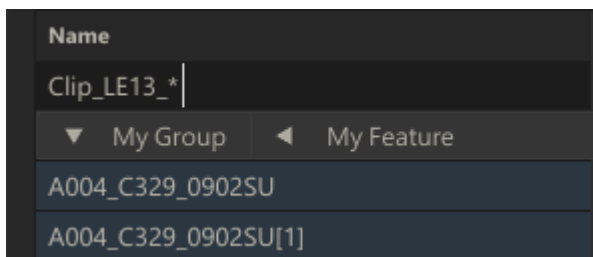
A timecode filter will include a shot when the timecode set in the control is between the In and Out timecode of that shot. Other filter controls take their value from the grid selection; selecting a row will update the value of the control. The filter is (de)activated by clicking the control itself.

The grid column header will show whether the filter on that column is active, even if the filter controls are not visible. The **Clear** button next to the Filter button in the lower right corner of the Media Browser dialog removes all filters.

EDIT GRID

Some of the columns displayed such as *Name* and *Reel ID* can be edited directly in the Grid by selecting the specific cell. Clicking the cell in the *Timecode* column will pop-up a calculator to update the value. Changing the shot property values in other columns is done through the available controls below the grid, which differ per view. By using the controls you can update the property values of all the selected shots (rows) simultaneously. Some property values/columns are for informational purposes only and cannot be altered from inside the Media Browser, such as the *Slot-* and *Layer-index*.
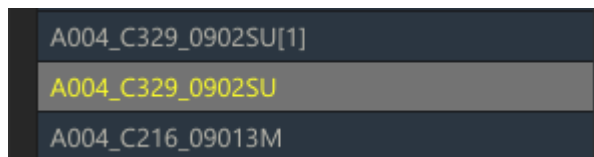
After updating a property value the value will show in yellow, indicating the change. The shot will only be actually updated after clicking the Apply Changes button. When doing so the text color will turn back to the default color.

OTHER GENERAL BUTTONS

Reset Selected

Reset the properties of the selected shots to their original values.

Delete Selected

Remove all selected clips from the project. Selecting this option will first grey-out the selected clips in the grid. You need to use the Apply Changes button to permanently remove the clips.

Apply changes

Commit all changed properties (shown in yellow in the grid). After applying the changes, the properties in the grid will return to the regular text color.

Copy Selected

Copy the selected shots into the SCRATCH Copy buffer. The copied shots can be placed in a CONstruct with the Paste Shots button in the main CONstruct menu.

Goto

Close the Media Browser and switch to the Group and CONstruct of the selected shot in the Clip Grid.

Get

Makes a copy of the selected shots and attaches them to the cursor. You can then close the the Media Browser and place the attached shots on a different CONstruct/slot.

Close

Closes the Media Browser. The current state of the Media Browser is maintained as long as the current project is loaded.

MEDIA BROWSER VIEWS

BASE

The Base View shows the shot's Framerate, Resolution, Aspect Ratio, In- and Out-points, Length, Reel ID, Scene and Take. Some of these values can be edited directly by clicking the corresponding cell in the grid. Alternatively the values can be adjusted for all selected clips at once using the controls below the data grid.

Mask Update

In the column list control you can select which field to update: shot *name*, *reel-id*, *scene* or *take*. Next, in the text-slate you can create an update-mask with (optionally) the available #codes. The **Set** button will apply the mask to all selected shots and update the shot-name property. You can type in the mask and/or optionally select #codes from the **Insert Metadata** option list. The last mask used will automatically be maintained in the project over sessions. To set a default mask for all projects use the Mask for media browser clips in the Advanced setting. Finally, the R button will reset the values of the selected field for all selected shots back to its original value. This option is only available for the reel-id, scene and take fields.

Other Controls

- The **Aspect** ratio has a number of presets. When selecting 'Custom', the **Scale** numeric control is enabled and can be set to a non-standard aspect ratio.

- The **In** and **Out** columns represent the absolute in- and out frame positions of a clip. The **+In** / **+Out** edit controls add or subtract the actual number of frames (rather than in previously versions re-calculate the values to increase / decrease the handles of a shot). If you click an individual In or Out position in the data-grid, the calculator panel will pop up.

- The **Length** column is not editable.

- You can enter a **Reel-ID**, **Scene** or **Take** and apply this to all the selected items by using the corresponding **Set** button. This will override any existing value that was read from the underlying media file or previously updated value. The **R** button allows you reset the value and revert back to its default value available in the underlying media file.

GRADE

The Grade View displays the format of a shot (lin., log., yuv), any Source Transform that is applied and whether the shot has any grading the applied to it. The last column is only for informational purposes.
Updating the Source Transform settings involves setting multiple controls. For more detail on the Source Transform see Chapter 7 - The Matrix.

FILES

This View displays the path and filename of the shot's underlying media track. If SCRATCH can not locate the referenced media (e.g. because it has been moved, renamed or the drive is temporary not available etc.) the path and filename will show red.

09:31:50:06	D:\media\MargaritaRED\RED\A004_C172_0901LE.RDC\A004_C172_0901LE_001.R3D
00:00:00:00	\\ASSIMDISK01\Media\Demo 4k HD x264 upside down.mp4
17:43:29:11	D:\media\MargaritaRED\RED\A004_C332_0902NR.RDC\A004_C332_0902NR_001.R3D
15:08:18:08	D:\media\MargaritaRED\RED\A004_C216_09013M.RDC\A004_C216_09013M_001.R3D
17:30:20:04	D:\media\MargaritaRED\RED\A004_C329_0902SU.RDC\A004_C329_0902SU_001.R3D
00:00:00:00	C:\Users\P.Huisma\Desktop\media\MargaritaRED\RED\A004_C216_09013M.RDC\A004_C216_09013M_001.R3D
00:00:00:10	C:\Users\P.Huisma\Desktop\media\MargaritaRED\RED\A004_C216_09013M.RDC\A004_C216_09013M_001.R3D
00:00:04:14	C:\Users\P.Huisma\Desktop\media\MargaritaRED\RED\A004_C172_0901LE.RDC\A004_C172_0901LE_001.R3D
16:32:49:07	D:\media\MargaritaRED\RED\A004_C220_09017S.RDC\A004_C220_09017S_001.R3D

The **Find Media** function allows you to re-link a Shot with the physical media. Clicking the **Find Media** button opens a Browser where you specify the folder from where SCRATCH starts the search process. The process will search though the underlying folders to find a match based on the full path and file name. When found, SCRATCH will update the shot's file reference and the reference will be displayed in yellow. To commit the update you need to press the **Apply Changes** button.

AUDIO

The Audio View of the Media Browser offers next to managing audio properties, functionality to match and auto-link shots and (**Broadcast Wave**) audio files (**BWF**), based on the time-code of the shot and the audio file.

Auto Match Audio

The **Find Audio** button opens a Browser to select the folder with the audio files. After selecting the folder, SCRATCH will start a match process for each selected shot against all audio files in the folder. If the timecode (plus length) of the audio file overlaps with the time-code (plus length) of the shot, the audio file is considered a match. A slip value for the audio is calculated based on the difference of the timecode of the shot and audio.

The matching process has additional settings.

- The **Best Match Only** option ensures that only one audio file is linked to any shot: that is the audio file with the most overlap with the shot. If this option is off - any audio that has overlap with the shot is linked to the shot.

- For calculating the overlap / slip of an audio file and the shot, SCRATCH uses the timecode in the audio file which is based on the sample rate used. In certain cases you might want to use a different sample rate for calculating the timecode and subsequent slip. The **Sample Rate** option allows you to set a sample rate override. Note that in case of a shot with 23.976 drop-frame frame rate, SCRATCH already uses an automatic override. If the audio file indicates a sample rate of 24, 48 or 96 kHz, SCRATCH will automatically use 24024, 48048 or 96096 respectively to compensate for the dropframe. To switch off this default behavior you can enable the SConfig variable AS_SAMPLERATE_OVERRIDE. Also note that this is purely for calculating the audio timecode and slip - not for playback.

- The **Clear Audio** button will remove any audio reference present with the selected shots.

With the slip control you can adjust the slip. Note that the slip control adds a delta to the existing slip and does not set an absolute value. The delta is always added to the actual value and never on a changed values that have not been committed yet with the **Apply Changes** button.

Disabling the **F** button next to the Slip control will show the slip value in milliseconds rather than in frames; both in the Grid column as for the Slip control.
The **Clear Audio** button removes the audio references of the selected shots.

Audio Properties

In the Media Browser you can edit the audio timecode and sound-roll properties. Both properties are read from the BWF audio - though can also be set without having audio linked. Both properties are also exported /imported with an ALE.

SCRATCH will also read **Scene** and **Take** properties from BWF audio if available. By enabling the SConfig variable AS_PUSH_AUDIO_METADATA these values overwrite automatically the scene and take properties of the shot with which the audio file is being linked.

R3D

The R3D View allows batch updating the specific settings of RED footage. For more information and background of the R3D specific settings see Chapter 9 - Process and Plug-ins.

13 - Process Queue

GENERAL

The Process Queue dialog can be opened from the corresponding button on the Main Menu bar in the CONstruct. The dialog can also be opened from within the Player, see also: Chapter 9 - OUTPUT AND PROCESSING.
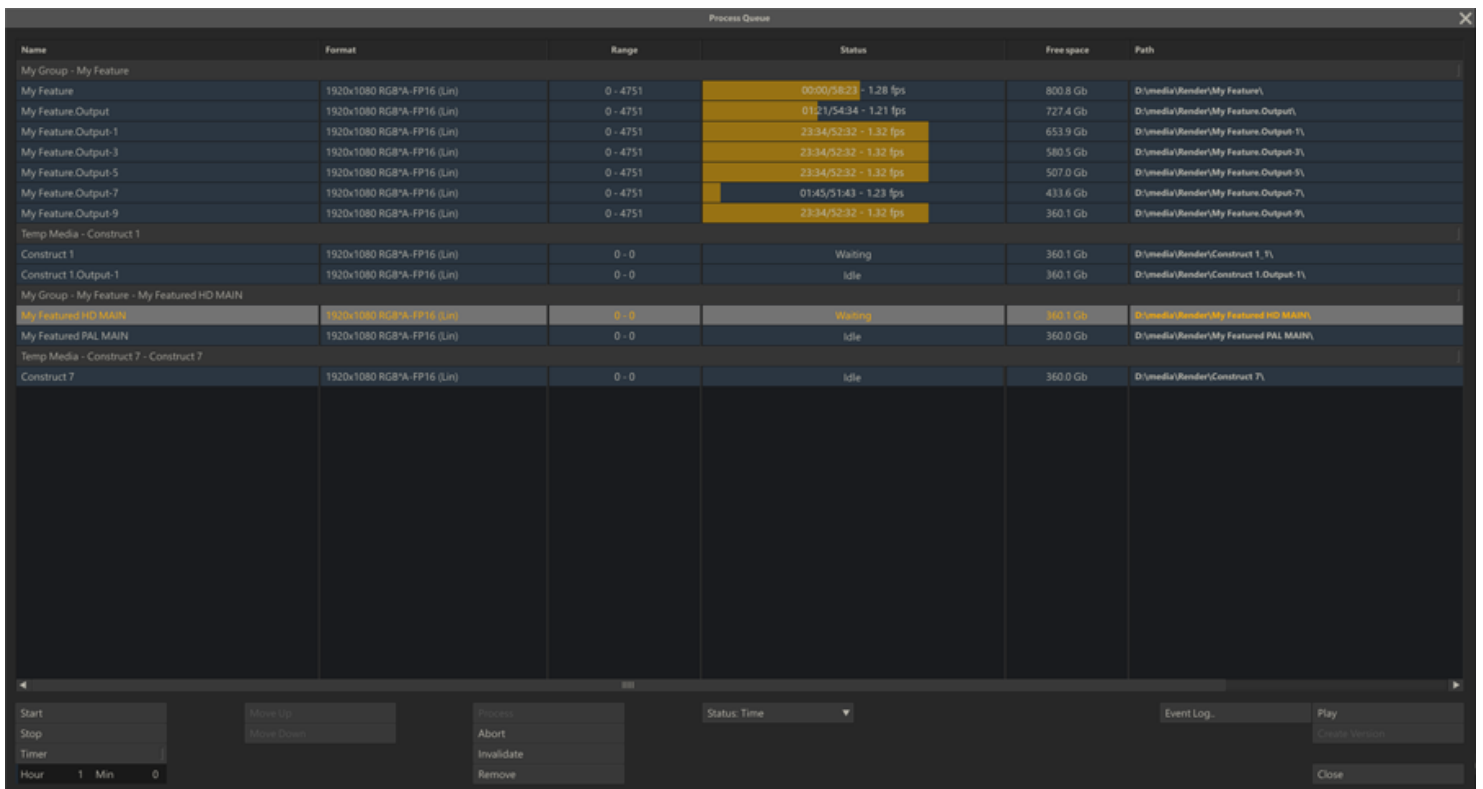
The Process Queue is a project level queue and consists of Output and Effect nodes that have been explicitly added. The queue is initially empty. Furthermore, the nodes in the queue are not copies; changes made on the nodes in another module of SCRATCH will be reflected in the output produced from the queue.

The queue is always sorted per CONstruct and so is the (prioritization of the) processing. For efficiency reasons nodes from the same CONstruct are processed in parallel so that an image from the Timeline in the CONstruct is not loaded more often than necessary. In case the processing of one node was started earlier than the processing of a second node, the processing

of the former might hold until the second caught up. SCRATCH can process multiple nodes at the same time but will always group them per CONstruct and process CONstructs after each other. You can determine the order.

Note: Processing will, even when performed in the background, effect playback performance and responsiveness of the application.

Nodes, once added to the queue, are never removed from the queue unless you explicitly remove them through the Process Queue dialog.

QUEUE GRID

The dialog lists a number of properties of the nodes in the queue. As mentioned, the nodes are grouped per CONstruct for efficiency reasons.

NAME

The first column shows the name of the Output or Effect node.

FORMAT

The second column of the queue grid shows the resolution and format of the underlying clip or node.

RANGE

The third column shows the range within the node that is to be processed; start frame and ending frame. Theoretically a node can appear more than once in the list with different ranges.

STATUS

The status column can contain different types of information, depending on the user settings and the state of the node.

- **Idle**: The node is present in the queue but neither processing or scheduled to be processed

- **Waiting**: Node is waiting to be processed after SCRATCH has finished processing the nodes currently processing.

- **Processing**: Node is being processed. The column will show a progress indicator and the progress in either percentage, frames or time, depending on the user setting.

- **Finished**: Node was processed. The node will not be processed again automatically unless the output is either deleted of invalidated. If the underlying media is invalidated, the status of the node will switch to *idle*.

- **Error**: When an error occurs in a sequential output node (such as a QuickTime) the processing is stopped and the status turns to error. If a non-fatal error occurs during processing, processing will continue but the status will be shown in red. You can find error message is available in the error log.

FREE SPACE

This column will indicate the amount of free disk space that will be left after processing the node. If the estimated amount exceeds the current available free disk space the amount will be shown in red. The space required of all preceding nodes from the top down is included in the calculation, provided they are set to render to the same disk.

Note: The remaining free space value calculated is an indication and might differ from the actual values after processing.

PATH

The last column in the grid shows the output folder the frames are rendered to.

QUEUE CONTROLS

The bottom part of the Process Queue dialog holds a number of controls to manage the queue.

START

This button will start processing the entire queue. This means SCRATCH will start at the top of the list and check each node's status and process it if needed. Nodes that are already processing the moment the button is pressed, will hold until it is their turn again.

STOP

This button will stop processing the queue. Any nodes currently processing will stop.

TIMER

You can also set time for SCRATCH to start processing. Before selecting the Timer button, first set the hour and minute in the controls below. When the Timer button is enabled SCRATCH will wait for the set time and then start processing as if you pressed the Start button.

Note: You should not exit SCRATCH or the current project for the timer to work.

MOVE UP AND DOWN

With these buttons you can alter the order in which SCRATCH processes the queue. You can only change the order of the CONstructs, not the individual nodes. To move a construct select the CONstruct's row in the grid and click the Up- or Down-button.

PROCESS

This will start the processing of all the selected nodes in the grid. The same order of processing and waiting applies as before but only the selected nodes are put in the waiting/process status, not the entire queue.

ABORT

This button will stop the processing of only the selected nodes.

INVALIDATE

This button will invalidate the underlying media of all selected nodes. This means that the nodes are ready for processing again and the underlying media will be overwritten if the node is processed.

REMOVE

This button will remove the selected nodes from the queue. The nodes are not removed from the project.

STATUS

With this Options List you can control what status information is shown in the Status column of the Grid when a node is processing; Time, Percentage or Frames.

ERROR LOG

This button will pop up the error log panel showing if and what error occurred. Use this function if a node indicates an error status. All errors are also logged to the main SCRATCH error log.

PLAY

With this button you can open the selected node in the Player.

CREATE VERSION

If processed frames exist for the selected node, then clicking on the Create Version button will load the processed frames as a new shot and clear the selected node's cache. The new version is attached to the cursor so you can place it in any CONstruct within the Project. This is a quick way to perform a 'mix down' of the CONstruct to a single shot before making additional changes.

The Create Version function creates a new *root-folder* for the shot and adds a post fix version number-increment to the folder-name (*V1, V2... , Vn*). All rendered media is moved to this folder. In case the media was rendered directly into the project's main render folder, a new *subVn* folder is created inside the render folder. If the rendered media is made up of one single file or file sequence, SCRATCH loads a single node. In case the media was rendered into different file sequences (over multiple folders), SCRATCH will load each of the shots and create a Collector node to hold them together.

CLOSE

This button will close the Process Queue dialog.

14 - Search

GENERAL

The Quick Search dialog can be opened by selecting the Search button on the Main Menu bar in the CONstruct view. The Search function allows you to perform text based searches for shots in the project and optionally adding a filter based on the color of annotations associated with the shots.
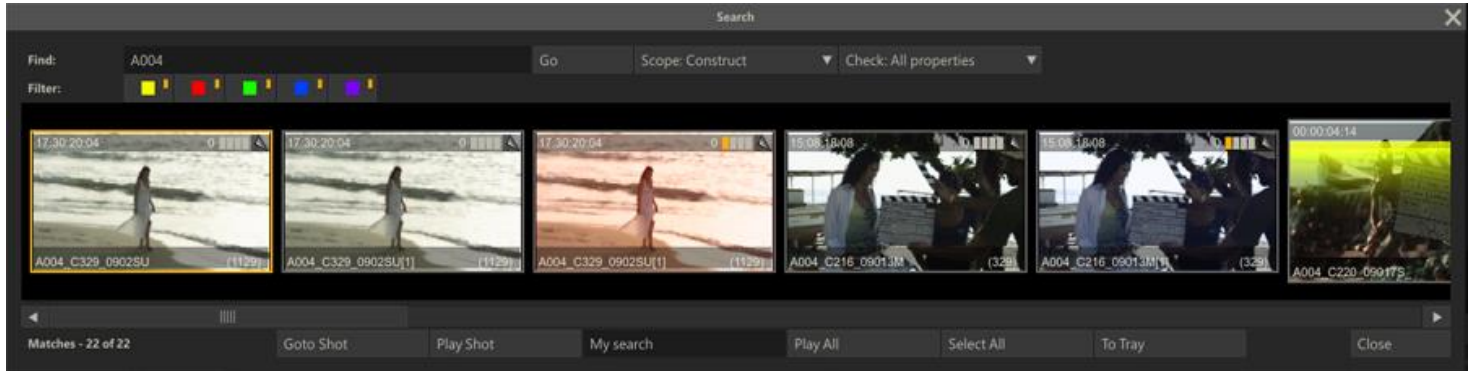
• Quick Key: Ctrl + F   » Open the Quick Search dialog

In the Text-slate in the top left corner you can add text. The text does not need to contain any wildcard characters - these are explicitly presumed. The color buttons on the next row can be switched on or off. This will act as an additional filter; clips with an annotation that have a status (color) that is switched off, will not be included in the search. By leaving the text-slate blank you can filter on annotation status (color) only. Alternatively by switching all color buttons off, the search will only include shots without an annotation.

SEARCH OPTIONS

Go

This will start the actual search process. The progress of the search is visible in the label left bottom corner of the dialog which will tell how many shots have been checked and the number of matches found.

Scope

This sets the scope of the search; Project, (current) Group, CONstruct or the Timeline of the current CONstruct only.

Check

This sets which text-properties of a shot are covered in the search; **All** its properties (name, reel-id, annotation, etc.), only the annotation or all properties except for the annotation. Even if the annotation is excluded from the text-search, the filer based on the annotation status (color) will still be applied.

SEARCH RESULTS

The proxies of the shots found are displayed in the dialog. From there you have different options.

Goto

This button will open the CONstruct of the selected shot and scroll to the slot where the shot resides. The dialog will close automatically and the search results remain available when re-opening the search dialog..

Play

This button opens the selected shot in the Player.

Play All

Every time you do a search - the results are also stored in a temporary CONstruct. With the Play All button you enter the Player with that CONstruct.

Select All

This button closed the dialog and sets all shots in the search result that are on the current CONstruct on selected. This selection can be used for other handling; copying, moving, removing, etc.

Close

This will close the Search dialog. The state and shots found are maintained while the project is active; opening the dialog again will show the last found matching shots again.

TEMPORARY CONSTRUCT

Every time you perform a search the results are stored in a temporary CONstruct in a temporary group.
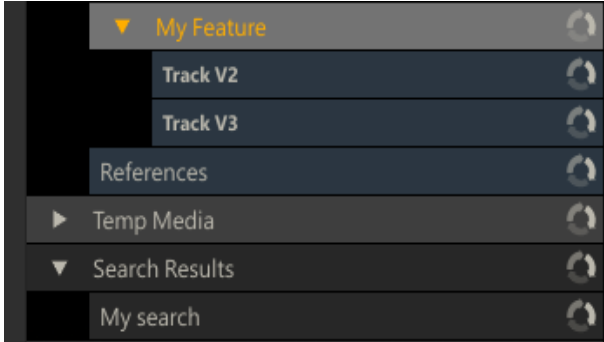
The name of the temporary CONstruct is set in the text-slate next to the **Play Shot** button. Every search will overwrite the temporary CONstruct of a previous search with the same name. All temporary CONstructs are cleared when exiting the project.

The temporary CONstruct contains **references** to the shots of the search results and does **NOT** make copies. This means that when you enter the Player with the temporary CONstruct and grade the shots, you are updating the original shots, located on a different CONstruct. This functionality allows you to quickly navigate and update sub-selections of shots.

05 - The Player

01 - Player Basics

GENERAL

There where the CONstruct is primarily about loading media, conforming and data management, the Player is where you do reviews, use all the creative tools for grading and compositing including (third-party) plug-ins, edit a timeline, managing audio and outputting to a VCR.

The UI of the Player is made up of:

1. The top part of the player, called the View Port, displays the current shot.
2. By swiping up or left the **View Port Control Bar** shows/hides at the top of the View Port.
3. Swiping right in the View Port will show/hide the **Media Stacks** for managing versions, meta-data, staging and outputs.
4. At the bottom of the View Port the semi transparent **View Port Tool bar** is located for managing the content of the View Port and switching between single- and dual view.
5. The **Player Menu Bar** splits the View Port and the Menu panels and contains the Transporter controls and the mini-timeline below it.
6. The bottom part is the **Menu Panel** and contains the controls of the current selected module.
7. In addition there are a number of **Floating panels** for tasks like managing Layers, handling Audio volume and displaying Statistics.

Re-size

You can re-size the view Port by swiping down. This will hide the menu panel but maintain the Transporter controls. Swiping down again will also hide the Transporter controls, making the image full screen. Another swipe action will revert to the initial situation.

The next two paragraphs discuss most of the generic elements in the Player and the different navigation tools.

02 - View Port Elements

GENERAL

The View Port is the same across the different Player modules provides a number of elements to manage specific view, comparing views and navigating your timeline and composites.

Note: When interacting with any User Interface elements, play back does not need to be stopped. The User Interface is always kept live.

VIEW PORT CONTROL BAR

The View Port Control Bar can be shown / hidden by swiping the cursor up or left in the View Port.

The buttons on the left side of the View Port Control Bar navigate the Player history, popup the Statistics panel, Layer list, Pipeline and Structure View or the Audio Mixer.

PREVIOUS / NEXT

SCRATCH maintains a navigation-list with timeline positions and composite elements. Every time you move the Player timeline position or navigate to an element in the current composite, SCRATCH adds an entry to this list. Using the (arrows) Previous and Next buttons you can quickly step though that list to switch between positions and elements. The navigation-list is only extended when you manually navigate to a different position or element in the Player - not on regular playback.

STATISTICS PANEL

The Statistics panel provides a set of tools for displaying different characteristics of the current image that is displayed in the Player: a Histogram, a Waveform monitor, a Vectorscope and a set of RGB curves.

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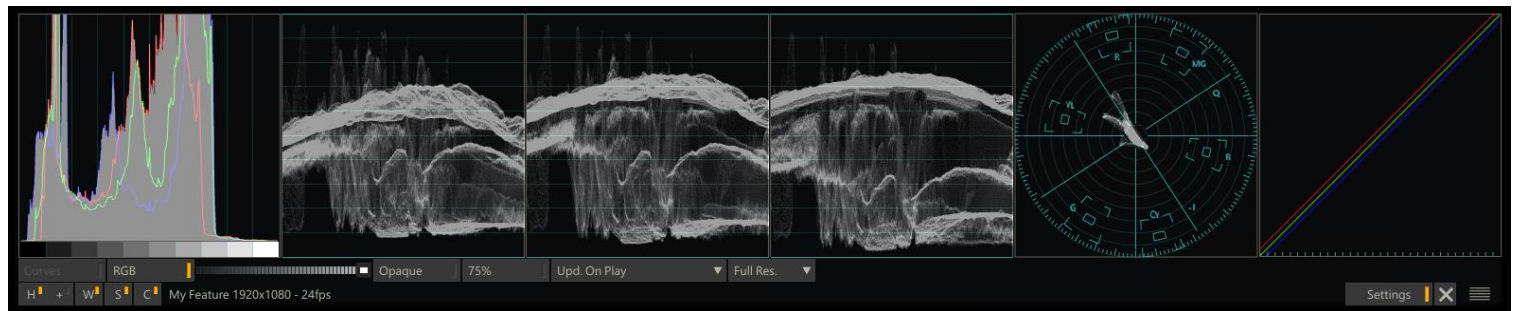
o Quick Key: Ctrl + 1   » Show statistics panel

Note: The Statistics panel uses GPU - OpenCL processing in order to be able to constantly refresh when playing while at the same time posing very little impact on overall performance. Most modern graphics card support OpenCL. However, when the graphics card used does not support OpenCL, SCRATCH will revert to the CPU version of the Statistics panel. The CPU version will by default only refresh the statistics after stopping the player or after each manual reposition of the current frame.

The video scopes are intended to monitor your source signal and can be used to legalize your image and prevent clipping on the source signal. They are not meant to replace any external scopes; the statistics are not based on the SDI signal and neither is a Monitor LUT taken into account (if used). Illegal color values are signaled in the panel by orange clipping lines appearing at the right or left axis of the Histogram, top or bottom of the Waveform and the circle edge of the Vectorscope.

Depending on how you entered the Player either the complete or just part of the image is included in calculating the statistics. In case you loaded a single clip (or Output node) into the player, the entire image is used in the calculations. However, when you entered the Player with a CONstruct, the format / resolution of the primary Output node of that CONstruct is the base for the calculations. This means that when you are playing a clip with a different (bigger) format than the primary output, only part of the image is included in the calculations.

Using the buttons on the bottom row of the Statistics panel you can switch the different statistics on and off. On the far right side of the this row there is a Gripper to move the position of the Statistics panel, a button to close the panel and a Settings button that will reveal more settings for the panel.
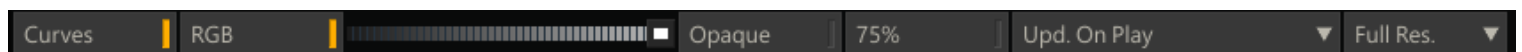
The **Curves** button will switch on / off the display of the RGB curves in the Histogram. The **RGB** button toggles the Waveform monitor in separate channels or as one overall luminance channel. With the **Grey-scale** you can set the intensity of the scope displays. The **Opaque** button controls the transparency of the Statistics panel.

Note: All the colors used in the Statistics panel can be adjusted; see chapter 11 - Customizing SCRATCH on how to change the interface colors.

With the **75%** button you can control the legal range for the Vectorscope. If switched on, the Vectorscope will indicate illegal values if any of the colors in the current image is over 75% saturated.

Finally, with the **Update** button you can override the default refresh scheme of the Statistics panel. If the hardware you are running does not meet certain requirements, the panel is only refreshed each time after stopping or manually repositioning the play position. You can force SCRATCH to refresh all statistics while playing, but be aware though that on certain hardware this can take a steep performance hit.

Histogram [H][+]

The Histogram display provides a visual representation of the balance of color and luminance in the current image. The horizontal axis of the Histogram is the range of values from 0 to 1.0. The vertical height of the histogram at any point along the horizontal axis represents the amount of that value present in the image. The higher the histogram, the more prevalent that value is. This allows you to quickly evaluate the balance of an image. For example, a very dark image would have a high peak in the histogram on the left side, as in the example below. This indicates that there are a high amount of pixels with values in the darker ranges.

You can resize the Histogram by toggling the [**+**] button. The smaller version can be useful as it will continue to be refreshed while playing even if SCRATCH is running on hardware not supporting full panel refreshing.

Tip: You can adjust the scale of the full histogram y-axis by using the Quick Key: Mouse-Wheel.

Note: When working with Log images, vertical lines will appear on the Histogram, showing the location of the legal black level (95) and legal white level (685). These reference marks will not be displayed on Linear images.

Waveform monitor [W]

The Waveform monitor displays the black, gray, and white levels in the current image in the Player. Each white dot in the scope represents the luminance, or gray-value, of a pixel in the image. You can toggle the Waveform display by the RGB button in the settings row of the Statistics panel. If the button is enabled, the Waveform will show each red, green and blue channel separately. If disabled, the Waveform shows the overall luminance levels of the image.

The position of the reference lines in the Waveform scope depend on whether the source material is flagged lin or log, similar to the legal lines in the Histogram. For log material the reference lines are on the legal black and white levels. For linear footage the reference lines are based on legal SDI levels.

Vectorscope [V]

The Vectorscope shows the colors of the current image in two dimensions: the shade / hue of the color, represented by where the color falls around the circle and the amount of color / saturation, represented by how far the color is out from the center.

Color Curves [C]

The Color Curves displaying on the far right of the Statistics panel provide a visual reference of how each color channel is being modified by the primary grade and secondary grade (excluding Canvas and Qualifiers).

STRUCTURE

The Structure View is a tool to view, navigate and manage your composite. It is discussed in more detail in the next paragraph.

PIPELINE

The Pipeline View is a schematic view of the Output tree, similar as the one in the CONstruct. The Pipeline view is discussed in more detail in the next paragraph.

LAYERS

Layers are discussed in more detail in Chapter 8 - Layers.

MIXER

SCRATCH's Audio Panel tool is discussed in more detail later in this chapter.

COLOR SAMPLING

Clicking on the Color Chip in the center of the Control Bar activates the color picker and opens the Color Selection Palette. The cursor changes to the color picker icon and you can sample the RGB values of any area of the image. The RGB values are displayed on the Color Chip. Clicking and dragging on the image continuously samples the RGB values. For more information about using the Color Selection Palette, see Chapter 2 – Getting Started.

MAGNIFY

The Magnify button opens up the Magnifying Glass interface. The Magnifying Glass can be dragged around the shot to provide a detailed view of that particular part of the frame. You can control the zoom level by clicking on the Up and Down buttons next to the Magnify button.
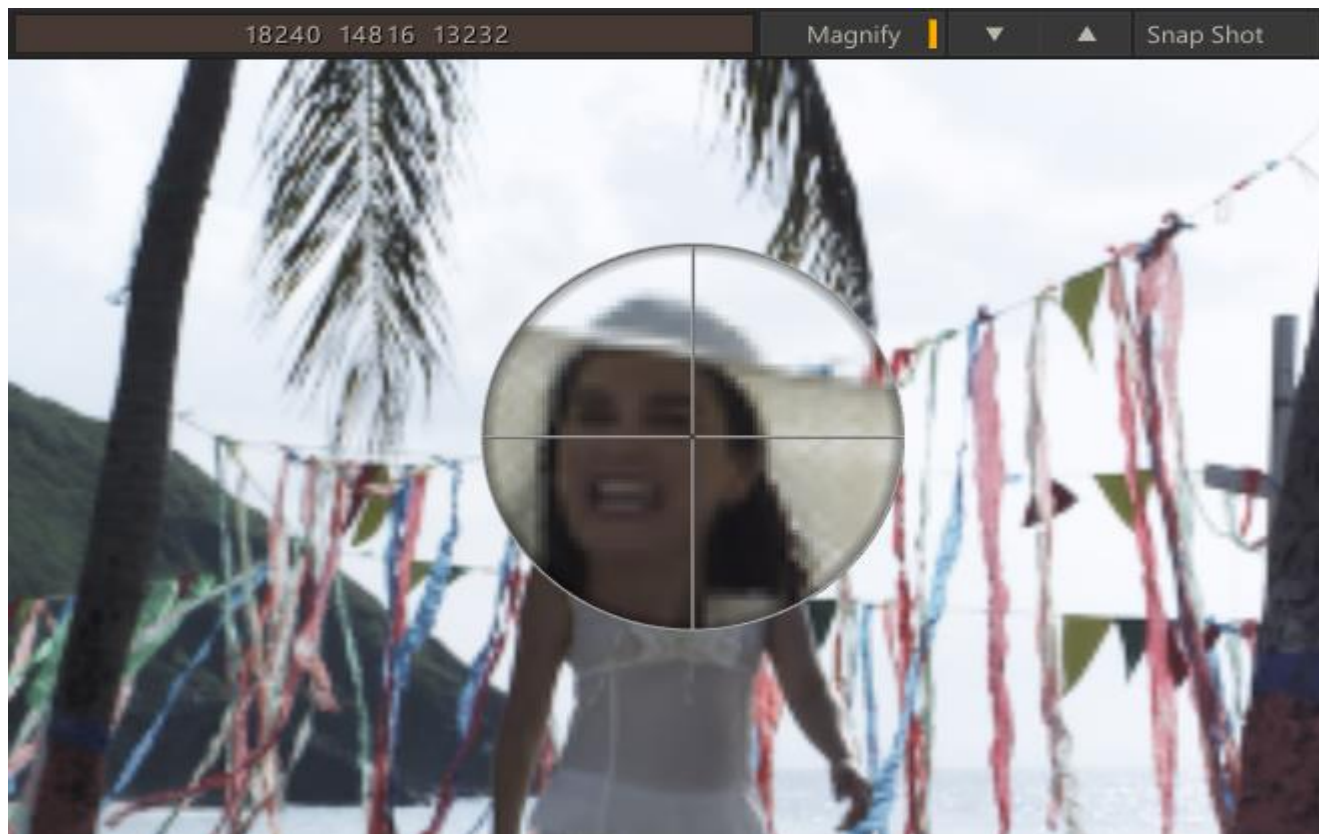
SNAPSHOT
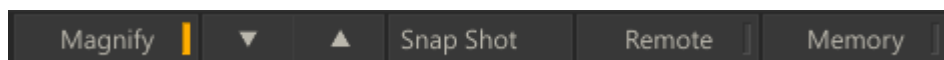
The Snapshot button can be used to create JPG or TIF images from the current display. The behavior of the button can be configured in the User Settings menu: see Chapter 3 – The Startup Screen for more information on how to configure the Snapshot function.

REMOTE

Opens a dialog to start a remote session. Remote sessions are discussed in detail in Chapter 10 - Collaboration Tools.

MEMORY

Opens the Memories panels for quick access to predefined grades and composites, discussed in more detail later in this chapter together with the Tray Galleries.

PLAYBACK PERFORMANCE MONITOR

Using Quick Key: Ctrl + F1 toggles the Playback Performance Monitor at the top of the View Port.

- Quick Key: Control + F1　　　　　　　　　　» Show/hide statistical information

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The Performance Monitor displays information showing the speed at which the system is performing certain operations.
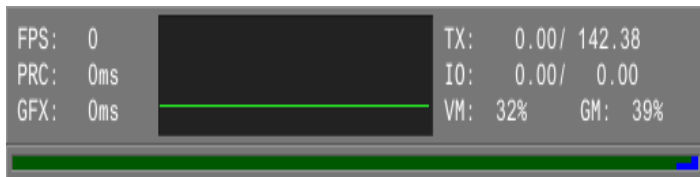
FPS

This is the average frames per second over the last 0.25 sec. The color of the FPS text identifies how the player is currently managing the refreshing of the screen:

- White = refresh locked to every V-sync interval

- Green = locked with a swap-interval, for example, 72Hz display, Refresh every 2 V-syncs

- Red = unlocked – refresh the display on a timer; some tearing may occur

The green graph to the right shows a running history of the average frame rate.

PRC

This is the average time it takes to build up the Shader, LUT and, geometry for rendering. Generally, this is an indication of how hard the processor is working to create a displayable image.

GL / GFX

This is the average time it takes the graphics card to render a single frame.

TX

This is the average number of Megabytes transferred from main memory to the graphics board during the last second. The second statistic is the total amount of texture memory allocated.

IO

This is the average number of Megabytes read/written to the disk sub-system during the last second. In some cases the figured are displayed in yellow. This indicates that the read/write was done not directly in SCRATCH; some third party plug-ins or QuickTime do their own dirk-IO. In that case SCRATCH gets the statistics from the operating system. Please note that these figures might not be exact as they can also include traffic from other applications that are active on the OS.

Note: Running SCRATCH with the –perf command-line option adds more detailed information about individual processor core performance. See the ENVIRONMENT VARIABLES section in Chapter 11 for more information about SCRATCH command-line options.

VM

The amount of Virtual Memory in Use.

GM

The amount of Graphics Memory in use.

VIEW PORT TOOL BAR

MAIN TOOL BAR

With the View Port Tool Bar you determine and manage the view in the View Port.

1. Lock / unlock the current view

In normal operations the view in the View Port will change with a change in selection: switching to a different track in a multi-layered timeline or when selecting an element in a composite. By locking the current view you can switch to another node for updating while maintaining the current view. Note though that the selected node MUST be part of the current view, otherwise the lock is automatically removed.

2. View the full context / main Output node

This option is a shortcut to view the main Output node that includes all tracks and underlying composites, while you can remain working on one of its underlying nodes.

3. Grading Bar-code

The bar-code that displays whether the current shot in the View Port has a grade applied to it. The barcode works identical as the barcode on a thumbnail image, described in Chapter 4 - The CONstruct. Clicking the bar-code will toggle the display of the grade of the shots in the View Port on/off. When switching off the grade, the bar-code is shown grayed out.

4. Shot info

Clicking this section of the Tool Bar will open a popup menu with predefined display options: Shot name, Reel-id, source or record timecode, framenumbers, keycodes or filenames.

5. Shot Index

The shot position within the timeline.

6. Proxy Timeline

Toggles on/off the display of the Proxy Timeline.

The Proxy Timeline can be used to visually navigate the timeline; clicking a proxy will move the play position to that shot. You can also drag/drop gallery items on the proxies to quickly apply grades.

7. Previous / Next Proxy

Toggle the display of the proxy images of the previous and next shots in the timeline on/off.

The proxies displayed also include any secondary grade if applied.

8. Dual View and Over Mode Switch

Switch between different possible views in the View Port: Single-, Dual- and Over. Dual- and Over view are discussed in more detail later in this paragraph.

9. Image Re-size options

- Zoom out on the image – this always zooms around the center of the image.

- Zoom in on the image – this always zooms around the center of the image.

- 1:1 – set the image to a 1 - to - 1 resolution with the native screen resolution so that one pixel of the image is represented by one pixel of the display screen

- Fit – fit the shot into the current View Port, taking into account floating tool panels and Media Stacks currently being shown.

10. Overlay toggle

Show or hide Scaffold or Plug-in overlay controls in the View Port. The underlying element is still active but the on-screen interface is not visible. This is useful when e.g. you want to see the effect of a secondary grade without any visual interference. In the Editor the Overlay button will toggle the Editor Overly mode, showing proxy images of the previous and next shot. for more details see Chapter 6 - The Editor.

11. Color Channel Toggles

To turn on and off individual color channel representations.

- R, G and B: Select between each of the Red, Green and Blue channels.

- M: Displays a particular color channel as a Monochrome (Black and White) image instead of the default, which uses the color of the channel selected.

- L: Displays only the Luminance of the image.

- A: Displays the Alpha channel of the image, if the current file format supports alpha channels

12. Mon.

Toggle the use of a color space transformation for the display Monitor on / off. See the paragraph on Monitor Settings later in this chapter about setting a color space transformations for your main and reference monitor. The toggle applies to both Monitors.

13. Grid

Toggle on/off a display grid in the View Port. The grid can be used for alignment of different elements in a composite.

VIEW PORT PAN CONTROLS

Panning an image is done by holding down the SPACE BAR, and then clicking and dragging the left mouse button in the view port area to change the position of the image within the View Port. Zoom and Pan controls use the following Quick Keys:

• Quick Key: Alt	» Zoom in and out by left-clicking in the viewport area and dragging up or down, or using the mouse wheel
• Quick Key: +	» Zoom in to the cursors current position
• Quick Key: -	» Zoom out to the cursors current position
• Quick Key: Alt + Home	» Zoom image to fit display
• Quick Key: Home	» Toggle display to the home and current position
• Quick Key: Control + Home	» Toggle display to current/fit image size
• Quick Key: Shift + Home	» Toggle display between full screen/fit image size
• Quick Key: End	» Zoom image guide to fit the display
• Quick Key: Spacebar	» Pan control
• Quick Key: F	» Adjust image framing with the mouse

Note: The M Quick Key adjusts the scale of the image in the Shot Framing settings. This is not the same as simply zooming in on the image within the View Port area. The M Quick Key will alter how the shot is framed within the current CONstruct resolution. The changes to the scaling of the image can be seen in the Process menu.

DUAL-VIEW TOOL BAR

With the View selector in the main Tool Bar you can switch the View Port to Dual view. In Dual View a second image and corresponding toolbar become available. Note that the right view in SCRATCH is ALWAYS for viewing / comparing only. You can not grade / composite or adjust the right shot in any way directly.
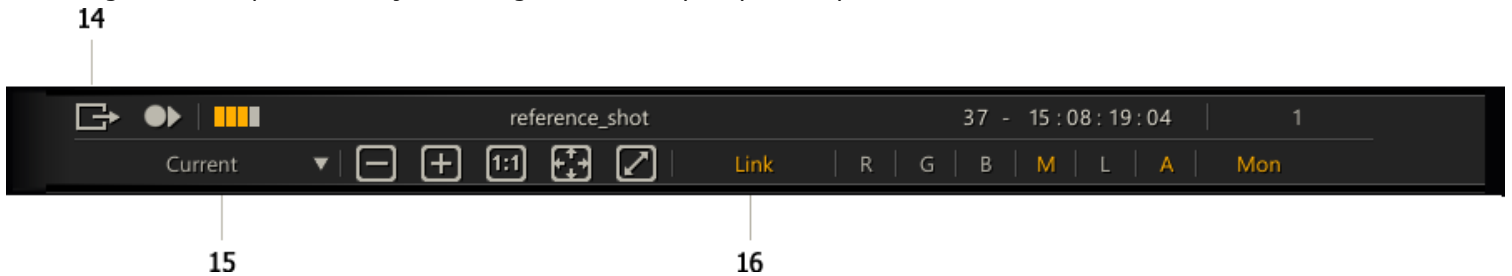
You can also use the Quick Key: D to open the Dual View mode.

• Quick Key: D	» Enable Dual View

14. Use Current Left View

This option moves the current left view over to the right view. This option allows you to virtually compare any combination of shots: if none of the short cut options contain the right view you need, just navigate to it and select this option. after that - navigate back to the shot you want to work on.

15. Right View Selector

Shot-cut to select a specific right view:

• **Current** - show the current node on the left also in the right pane. Optionally you can add a slip to the right view for comparison. See the section about the dual view Slip Control later in this paragraph.

• **Tray** - Show the current selected shot in the Project Tray. In order for this option to become enabled, you must make sure a shot is actually selected in the Project Tray. When clicking a shot in the Project tray while in dual view will automatically update the right view.

- **Custom** - this option will shows the node that was last selected with the Use Current Left View option.

- **Output** - the same as using the show Main Output node option in the first row of the Tool Bar.

An alternative way to set the right view is to **drag and drop** a shot onto the right view.

16. Link views

Both the left and right images can be zoomed and panned independently by placing the cursor over one of the images and using the standards zoom and pan keyboard controls or using the zoom controls on the corresponding Tool Bar. By enabling the Link button you link the two images together so that the zoom and pan keyboard controls will affect both images.

DUAL VIEW SLIP CONTROL

When you are in dual view, the Slip Control is shown between the two toolbars. With this control you can set and adjust a slip between the two views. In addition by clicking on either the left or right part of the control you can toggle on/off whether the respective view is linked to the transported controls. This way you can play one view and pause the other and determine / set a slip value.

 both left and right view are played with zero slip for the right view.

 the right pane is paused and the slip has amounted to 146 frames

Note that when the right view is a shot from the Project Tray - the slip value that you set will be stored with that Tray shot. When you switch back and forth between different Tray shots, SCRATCH will restore the last slip value used with that shot.

OVER MODE

Next to Single- and Dual View there is the Over mode option in the main View Port Tool Bar. This option displays two images over each other for comparison. When this mode is selected the Over Mode Tool Bar at the top of the View Port becomes available. There are two states for the Over mode; A/B (superimposed) and A-B (subtracted). In case of the A/B state the tool bar controls the display of the Wipe associated with this view: Horizontal position, Rotation and Transparency.

The Opacity level determines the level in which the A image is shown more / less opaque. The Wipe position can also be controlled directly in the View Port by clicking and dragging the control overlay that become available.

When you first enter the Over mode the Wipe overlay will show. When you hover the mouse over it and away from it the overlay will disappear until you hover the mouse back over the Wipe position. You can pick up the overlay anywhere to move it horizontal / vertical. By picking the overly up at the middle circle you can rotate the wipe.

In A-B mode (difference view) there is no Wipe but you have an additional Gain control to highlight any differences between the images.

Lastly, you can also popup the Over Mode A/B by using Quick Key - S. In that case the View Port shows you superimposed the current image and the current image in the trim buffer; the image with a prior grade. The Trim buffer is discussed in more detail in Chapter 7 - The Matrix.

• Quick Key: S   » Show Trim Buffer Wipe

MAIN MENU BAR

The Main Menu Bar divides the View Port and the lower menu panel.
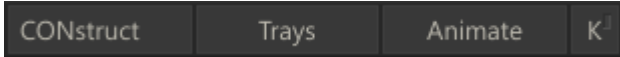
CONSTRUCT

Exit the Player session and return to the CONstruct view.

TRAYS

Open the Trays view - discussed later in this chapter.

ANIMATE AND [K]EYFRAME SELECT MODE BUTTON

The **Animate** button opens and closes the Curve Editor to manage animated parameters, discussed in Chapter 7 - The Matix. The **K** button toggles the play controls into Keyframe Select mode so that the previous and next shot buttons are replaced by the previous and next keyframe buttons. These buttons allow you to jump between keyframe positions on the current shot. This is an easy way to navigate between keyframes when adjusting animated values. Keyframe Select Mode is covered in more detail in the ANIMATION section in Chapter 7.

PLAYBACK CONTROLS

The main transport controls are located in the center of the Menu Bar.

The function of each button is as follows:

◆	Play repeat options
⏮	Jump to the first frame
⏮	Jump to the previous shot in the timeline
◀	Jog backward one frame at a time, or play backward if held down
◀	Play backward
⏸	Pause/stop playback
▶	Play forward
▶	Jog forward one frame at a time, or play forward if held down
▶	Jump to the next shot in the timeline
⏭	Jump to the last frame
(	Mark IN point

⏽ Mark OUT point

🔈 En- disable audio

Playback Quick Keys:

- **Swipe Action:** Left/Right   » Play backward/forward (full screen only)
- **Quick Key:** Up Arrow   » Play forward
- **Quick Key:** Down Arrow   » Play backward
- **Quick Key:** Right Arrow   » Jog forward (auto-repeat if held down)
- **Quick Key:** Left Arrow   » Jog backward (auto-repeat if held down)
- **Quick Key:** Enter   » Stop/start play
- **Quick Key:** Control + Right Arrow   » Jump forward to the next shot
- **Quick Key:** Control + Left Arrow   » Jump backward to the previous shot
- **Quick Key:** I   » Set IN point to current frame
- **Quick Key:** O   » Set OUT point to current frame
- **Quick Key:** Control + P   » Toggle through play repeat modes
- **Quick Key:** R   » Focus on the currently marked range

PLAY REPEAT OPTIONS

Initially, the Play Repeat setting is set to Play Once, as indicated by the → button at the left of the play controls. Clicking on this button cycles through these options:

→ Play once only – the default option

↻ Repeat play in either direction; Playback repeats in the same direction once the end of the sequence is reached

⇆ Ping-Pong, or bounce play

In addition when you hold down the Control key while clicking this button you can change the Playback speed to 2x, 4x, 8x, 10x, 20x, 50x.
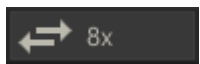
When holding down the Shift key when clicking playback speed reverts back to normal.

MINI-TIMELINE

A mini-timeline is displayed underneath the Play Controls. You can scrub through the timeline by clicking and dragging inside the mini-timeline window. When multiple shots are loaded, the mini-timeline alternates between light and dark blue to show each individual shot. The number slates to the left and right of the mini-timeline display the frame number of the IN and OUT marks. By default, the IN and OUT are set to the first and last frame of the sequence, unless changed by pressing the IN and OUT buttons.

RANGE CONTROL

You can adjust the range of frames that are played back in the Player by using the RANGE button. With no IN and OUT marks selected, and multiple shots are loaded into the Player, the RANGE button automatically focuses the Player on the current shot. All play back is limited to this range of frames until the RANGE button is un-selected, at which time the Player returns focus to the entire clip or timeline.

When a range is defined, the mini-timeline and all frame indicators are updated to reflect the current range. The IN and OUT buttons are used to define a range manually. Once set, the RANGE button adjusts the Player to focus only on the frames between the two marks. Un-selecting the RANGE button returns the Player focus to the entire clip or timeline again.

The IN and OUT marks can be set during playback; or, they can be set manually by entering values into the text boxes to the left and right of the mini-timeline.

SOURCE MODE

When you entered the Player with a complete timeline you can not directly view before and after the in / out points of an individual shot. By enabling the Source mode the Player timeline shows you only the current shot including its handles. By default a Range is set from the In to the Out point of the shot.

SCRATCH will automatically switch to Source mode when you select an input of a composite. In the Editor switching to Source mode allows you to edit the timing of all inputs of the current composite shot directly and in context.

FRAME INDICATORS

To the left and right of the play controls are two text boxes. The left text box is the current frame counter. This shows the current frame count from the beginning of the timeline, shot, or marked range.

The right text box is a percentage indicator. By increasing the value in this box, you can determine the amount of handles added when focusing the range on a single shot.

A value of 100, for example, adds half the duration of the shot as handles to the beginning of the range, and half to the end of the range. When RANGE is turned on, the value in this text box updates to show the total length, in frames, of the range.

AUDIO TOGGLE

Toggle audio on/off. If there is no audio available with the current clip - the button is greyed out. Audio is discussed in more detail later in this chapter when describing the audio panel.

USER CONFIGURATION

The Gear button opens / closes the User Configuration Dialog.

UNDO, REDO AND RESET BUTTONS

On the right side of the Menu Bar are the UNDO, REDO and RESET buttons. These buttons are present everywhere in the Player, allowing you to undo a previous operation, redo an operation, or reset the current menu page.

METADATA STACK

On a right Swipe action in the View Port or by using Quick Key: Q - a panel appears that holds a number of tools; the Version-, Layer- and Staging stack as well as the Metadata Stack. The first three are discussed in more detail later in this chapter as they more used for navigation. The Metadata Stack allows you to view as well as edit the metadata of the current shot. The Meta Data Stack is also available in the CONstruct. To display the Metadata grid use the corresponding tab at the bottom of the panel.

Current Shot Proxy

At the top of the Metadata Stack the proxy image of the current shot is displayed. Through this proxy you can also display and edit any Annotations with the shot as described in Chapter 4 - The CONstruct. Use Quick Key: A - to open the Annotation for editing.

Fixed Metadata Items

The first 5 rows of the the Metadata grid always contain the name, reel-id, scene, take and timecode of the current shot. You can update these items but can not remove them. Putting the timecode-row in edit mode will display the Calculator for entering a new new timecode.

Extended Metadata Items

All the rows in the Metadata grid below the fixed metadata items are the extended properties of the current shot. The properties present mostly depend on the media format of the shot. You can add, remove or update items. Note though that removing an item will not remove it from the physical underlying media and the item might return when reloading the project.

Editing Metadata

You can update the metadata by wither clicking on the value column of a selected row or by using Quick Key: E. After updating the value the text will be displayed in yellow. All changes are saved when either moving to another shot on the timeline or when exiting the player. Before the data is saved you can use the **Reset** button to clear all changes. The **Add** button will add a new row at the bottom of the grid. In this row you can adjust both the Item name and value. The Delete button will remove the selected item; as mentioned - you can not remove any of the Fixed meta data items and removing any of the Extended properties does not update the underlying media.

Note: When Adjusting the Timecode property, SCRATCH takes into account the current position of the shot in the Player.

- Quick Key: W   » Show right tool Stack

- Quick Key: Up / down arrow keys   » Change selected row

117

03 - Navigation Tools

GENERAL

To be able to navigate efficiently between different modules, it is important to get fully acquainted with the navigation model. For this it is you should keep in mind the different dimensions of a shot and a CONstruct as displayed in the diagram below.
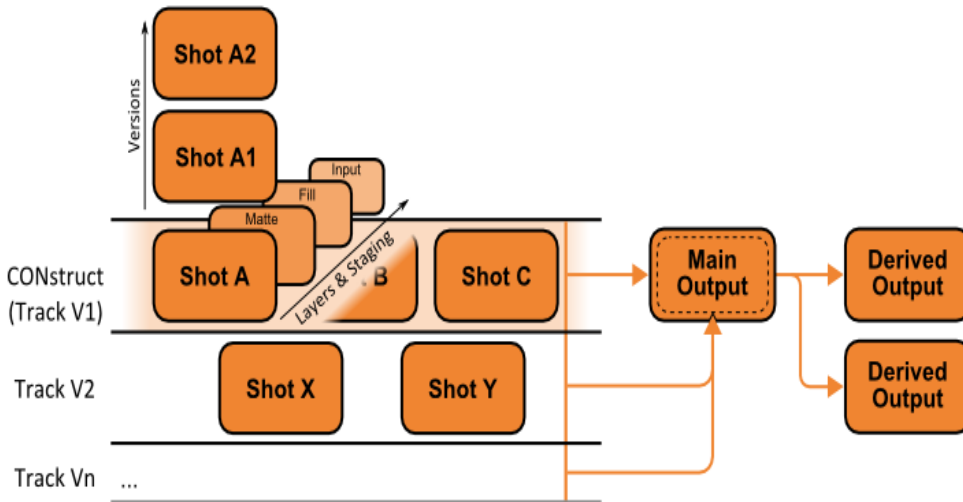
You enter the Player with either a single shot, an entire CONstruct or an Output node.

ENTERING THE PLAYER

SINGLE SHOT

To load an individual shot into the Player, use one of the following methods:

- Pick up the shot by clicking in the middle of the thumbnail with the cursor, and then click on the Play button in the middle of the CONstruct interface.
- Right-click on a shot in the CONstruct and select PLAY SHOT.
- Place your cursor over a shot and hit the Escape Quick Key.

- Quick Key: Esc   » Play the shot under the cursor

Using any of these methods switches the Player automatically into Source mode - discussed earlier in this chapter - and shows the entire shot; any handles used in the CONstruct are set as a Range.

The Player can also be started as a stand alone module by opening a shot directly from the operating system. Details of this are discussed at the end of this chapter - in the paragraph on the file-based Player.

CONSTRUCT/ TIMELINE

The entire CONstruct can also be loaded into the Player as a timeline. In this case, the playback cursor starts at the beginning of whichever slot is currently selected in the CONstruct. To load the entire CONstruct into the Player, use one of the following methods:

- Click on the Play button in the middle of the CONstruct interface without any shot attached to the cursor.
- Right-click and select PLAY ALL.
- Hit the F1 key.

When you use any of these methods while you are in a track-CONstruct, automatically the main CONstruct is loaded and the corresponding track is made the current track.

OUTPUT NODE

Entering the Player with an Output node is similar as entering it with the CONstruct - only the output will be selected. You can switch back using the Version Stack, discussed later in this chapter.

NAVIGATION TOOLS

Depending on how you entered the Player you have full access to all underlying elements: timeline shots on the main and sub-tracks, all versions of shots, inputs of a composite shot, shots in the Staging area of a shot, all (derived) output nodes of the main- and sub-tracks and different reference and project library shots in the trays. The Player has multiple tools to navigate to these different elements for review and update by themselves or in context.

- Track Selector; switch between different tracks in your multi-layered timeline.

- Version Stack; navigate, add and change order of versions of a shot in the Timeline.

- Staging Stack; navigate, fetch and add composite elements in a shot's local holding area. 🔲

- Source-Stack; navigate the actual composite from the current shot down.

- Layer List; navigate, add, (re)move shot layers. 🔲

- Structure View; view, navigate and edit the full composite-tree of a shot using a schematic. 🔲

- Perspective View; view a 3D space schematic of Scaffold layers and camera positions and perspective. 🔲

- Pipeline View; view and navigate all (derived) Outputs of a Timeline.

- Trays; Navigate project wide holding areas, use for copying grades or as reference for the current timeline.

Each of these tools are discussed in more detail in the remainder of this paragraph. Other navigational elements that were already discussed in the previous paragraph are:

- Mini Timeline for navigating the timeline / shot frame position.

- Proxy Timeline for navigating the timeline shot position graphically.

- Previous / Next controls in the View Port Control Bar for navigating prior selected timeline positions and composite elements.

- View Port Tool Bar for selecting a specific context view.

- Source mode to view the current shot or composite element including its in / out handles.

As an indicator of your present location and dimension in the Player - SCRATCH uses a number of color-codes:

- Blue indicates that you are working on the current shot on the first track of the timeline.

- Purple indicates that you are working on the current shot on a sub-track.

- Yellow indicates that you are working on an output node.

- Green indicates that you are working on composite element or switch to Source mode for the the timeline shot.

Note: The color code indicates on which node you are actually WORKING. This does NOT necessarily has to be the same shot that you are VIEWING as the View Port allows you to select the Output node or lock to a Parent node to view the active node in context.

TRACK SELECTOR

The track selectors are available on the far left side of the Matrix and Editor menu pages. You can select a different track by clicking on it. Selecting a different track means that the current shot on that track becomes the active shot.

If there are more tracks present than fit on the screen you can pan the track selector up and down by holding down the space bar while dragging the selector up or down. For more details on creating new tracks or removing tracks - see Chapter 6 - The Editor.

VERSION-, SOURCES- AND STAGING- STACK

For quick navigating through the different dimensions of a CONstruct and a shot you can use the shot Stacks which are available on a right Swipe action or using Quick Key: W. With the buttons at the bottom of the panel you can select witch Stack to display. This panel also harbors the Metadata stack, discussed earlier in the chapter.
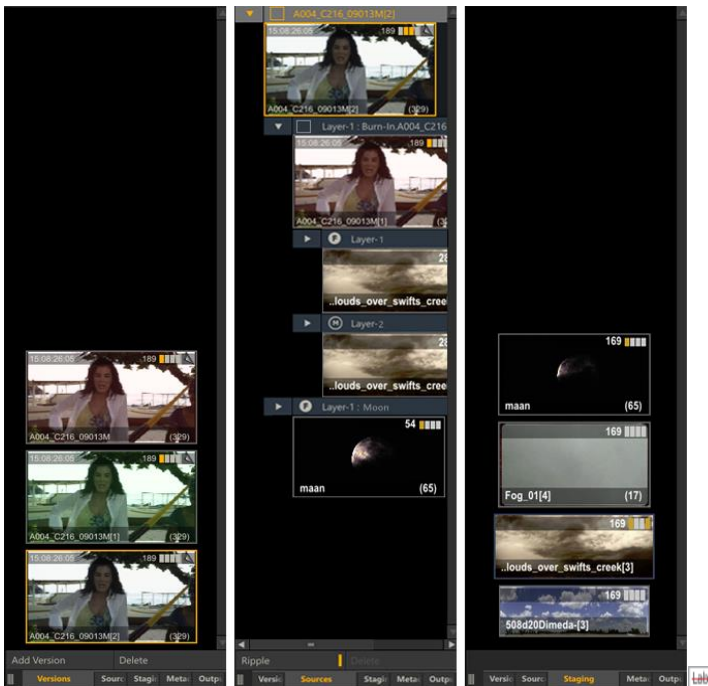
| • Quick Key: Swipe right | » Toggle Player Stacks |
| • Quick Key: W | » Show Player Stacks |

The **Version Stack** shows you all the current shot on the CONstructs and all available versions. You can create a versions of the current selected shot by using the **Add Version** button or alternatively use the **Delete** Button to remove a selected version. When you select a version in the Stack it will show in the View Port - even if you have selected the main output node as context. To permanently change the order or Version or to make a version the Timeline shot - you pick it up and drag it to the desired position.

The **Sources Stack** shows all the inputs, fills and mattes used in the current shot. The type of element is indicated by the icon and text left of the name of the item; a square for an input shot, an **F** icon for a Layer fill shot and an **M** icon for shot used as matte in a Layer. The stack can be expanded to the left using the gripper at the left bottom to better display the full hierarchy of inputs on inputs. You can collapse (part of) the tree by using the Arrow buttons to the left of each element. Further, you can **drag and drop** items onto the Sources Stack to replace elements.

The **Ripple** option determines if collapsing an element will automatically collapse all elements on the same level. You can replace elements by dropping another shot onto it. To show *recursion* the name of the element is shown in red.

When selecting an item in the Sources Stack, the Player will automatically switch to **Source mode**. To revert back to the Timeline shot either click the top node in the Sources Stack or select the Version Stack.

The **Staging Stack** is identical to that described in the previous chapter - displaying a shot's holding area and all items used in a composite. From here you can pick up / drag items to be used as elements in your composite.

LAYER LIST

With the Layers toolset you can create unlimited layers on top of (the primary grade of) a shot. Each layer can have its own color grade, shape, softness, color qualifier, animation, tracking and fill / matte combination. Any fill and/or a matte used on a Scaffolds will also be included int the Layer Stack and Structure View.
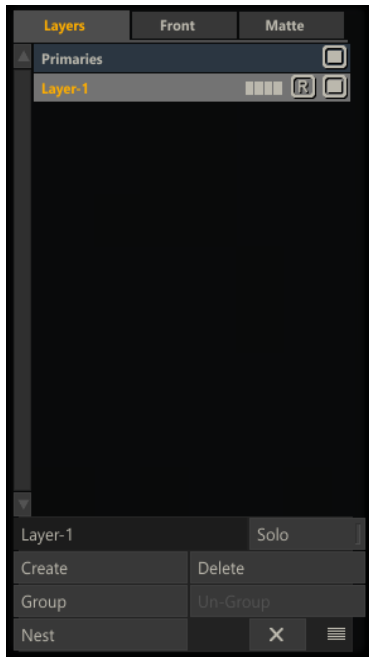
The Layer List is available as floating panel which can be opened using the top toolbar.

Alternatively, the list can be docked to the left side of the screen and open / closed with a left Swipe action. Layers are discussed in detail in Chapter 8.

STRUCTURE VIEW

GENERAL

The Structure View is a tool that displays the full hierarchy of a composition shot and allows for editing its components. You open the View using the top menu in the player or Quick Key: Ctrl + 2.The View is displayed semi-transparent over the current shot. If you are in Dual View the Structure view will only show in the right pane.
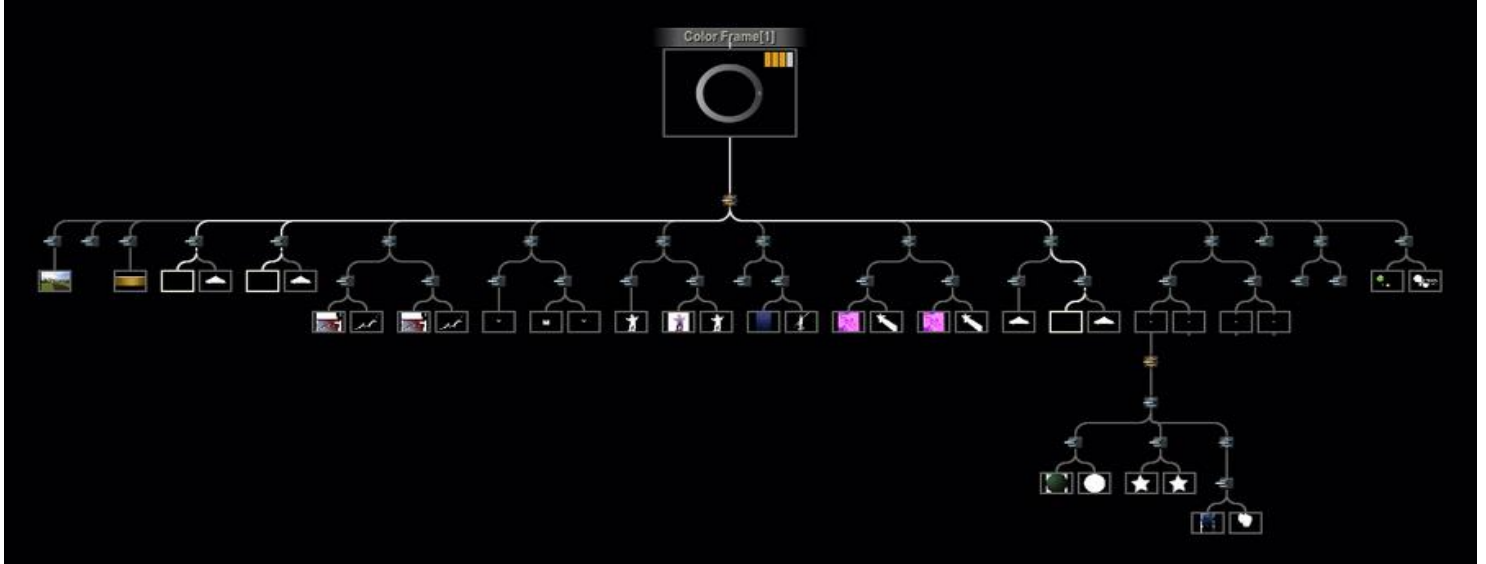
• Quick Key: Ctrl + 2	» show / hide Structure view

The Structure View always shows the full tree of the main (timeline) shot (or version) - even if you prior to opening it navigated one of its underlying elements. The view includes these element types:

• The main shot as the top node

• All direct inputs and plug-ins used

• All Layers that have a fill or matte - indicated using the **F** and **M** icons, similar to the Sources Stack

You can re-size and pan the view in the same way you scale and pan an image, as discussed earlier in this chapter.

INTERACTIONS

If you select an element in the Structure view by clicking it, the view closes and the Player loads the selected shot or selected the Scaffold that was clicked. When opening the view the selected element is highlighted as well as all the connector lines from the top-node to that element. If there are multiple instances of that element all of them are highlighted as well as all connector paths.

Each element that has one or more child elements below it has the option to collapse / expand the sub-tree below by clicking the arrow button below the element. When collapsed the button will tell you the number of items that are hidden. Clicking the button again will expand the sub-tree again. The current state of a Structure View is stored with the composite / top shot.
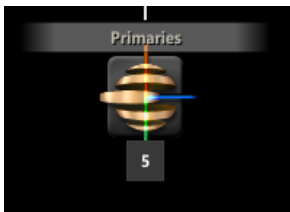
When you hover over an element a popup menu displays that allows you - depending on the element type - to activate / deactivate the it using the A button or to delete it using the trash-bin icon button.
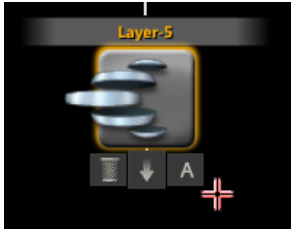
You can add or replace elements directly in the Structure view by dragging those elements - either from elsewhere in the Structure View, from the Staging stack or Scaffold list of another shot - and dropping them on an element in the Structure View. While dragging an item and hoovering above an element in the Structure View a circular menu is shown across that element with one or more options. You either select one of those options or click directly on the element - using the default option that is highlighted in the menu.
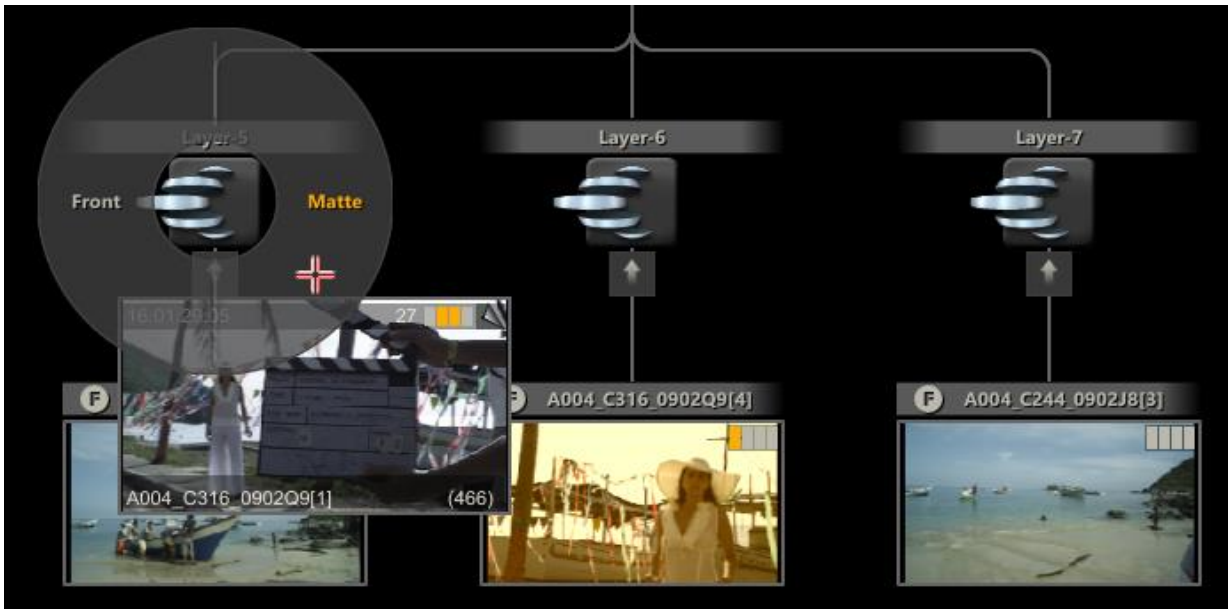
Possible actions are: adding or replacing an input of a plug-in, adding a shot as front or matte to a Scaffold, adding or moving a Scaffold.

PERSPECTIVE VIEW

The Perspective view offers a 3D schematic view of your scene: Camera, Scaffold layers and Back plane. You can drag and rotate the view into any angle desires. See Chapter 8 - Scaffolds, the paragraph on the Camera menu for more details on manipulating your scene and the different possible (perspective) views. Note that the presence of at least one Scaffold is required for the Perspective view to be available.
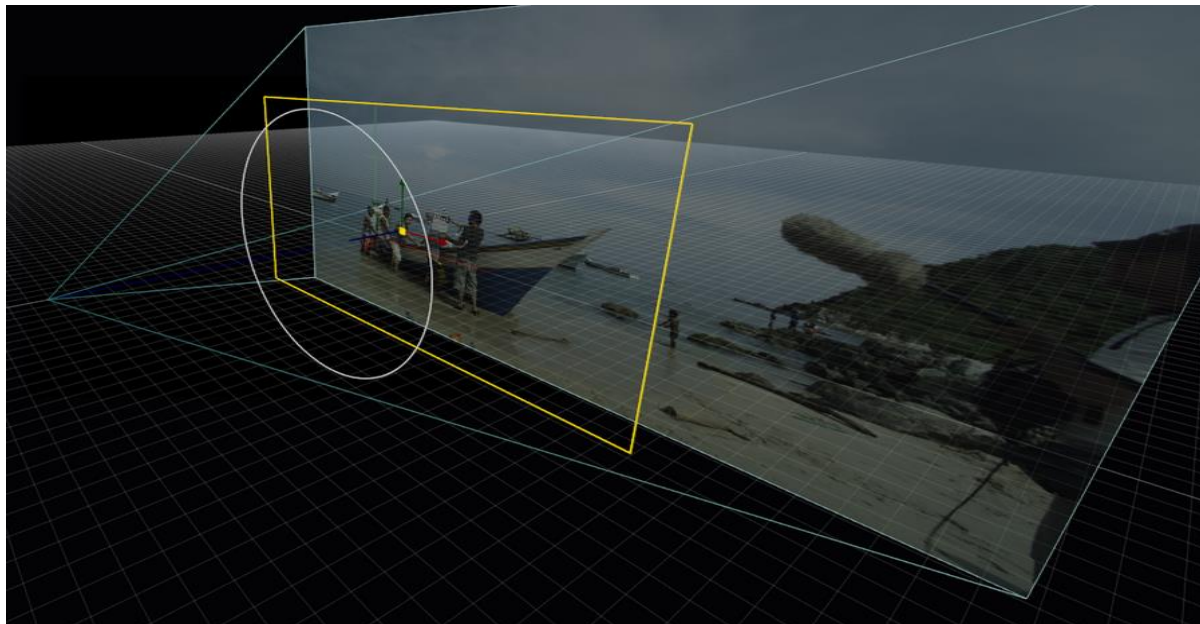
• Quick Key: P	» show / hide Perspective view

PIPELINE VIEW

The Pipeline View can be opened using the corresponding button in the top menu bar in the Player. The pipeline view displays the hierarchical tree of all Output nodes of a CONstruct - identical as it is available in the Output module of the CONstruct. In the Player the Pipeline View offers an additional tool to navigate through the Outputs. Selecting an item in the view makes the Output the current node in the Player. Outputs are discussed in more detail both in Chapter 4 - The CONstruct and in Chapter 9 - Process and Plug-in.
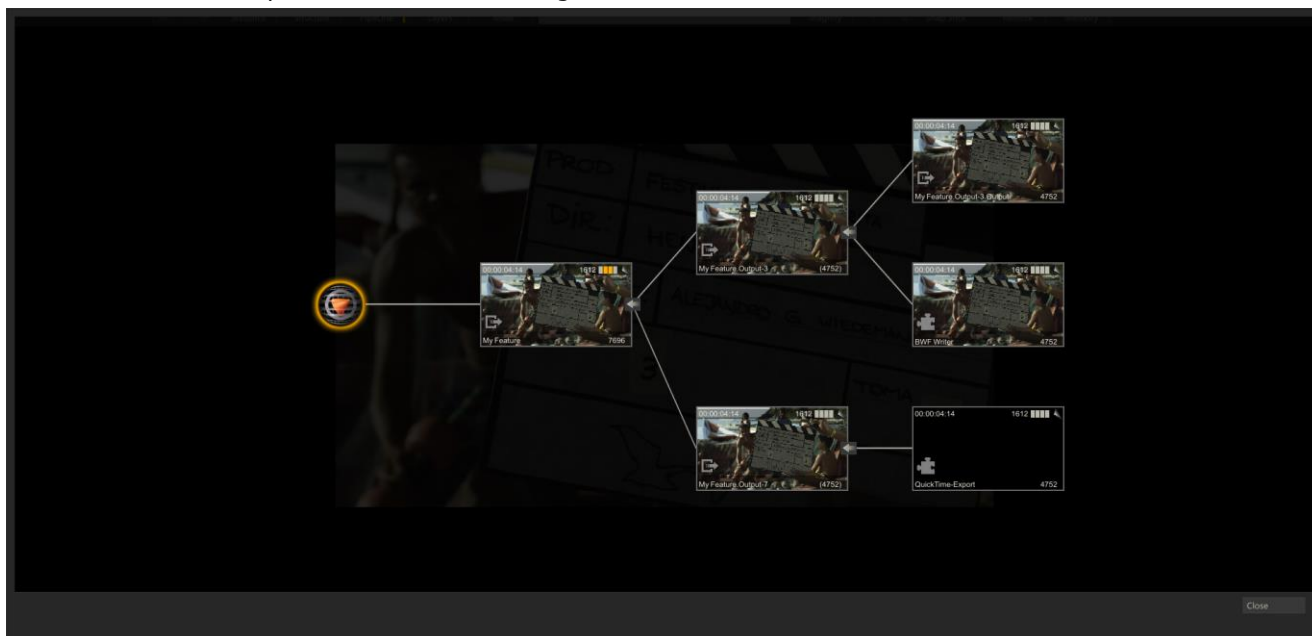
• Quick Key: Ctrl + 4	» show / hide Pipeline view

TRAYS

As mentioned in the previous chapter, there are two types of Trays: Project Trays and Gallery Trays. Project Trays hold shot references and the scope of a Project Tray is the current project. Gallery Trays only hold the grade and composite meta-data but no link of actual media data - except for a proxy image. Gallery items are stored in jpeg files outside the project database and in the user folder and as such are available from all projects.

All of the Tray functionality is discussed in detail in Chapter 7 - The Matrix.

TIMELINE

In the Player, the Project Trays always contains a dynamically created Timeline Tray. This Tray holds references to each clip in the timeline. There where the Proxy Timeline can be used for navigation - this Timeline Tray provides a view that case be sorted and used to quickly select or grade whole sections of your timeline. You can quickly select the current shot in the Timeline Tray by using Quick Key: T.

• Quick Key: T	» select the current timeline shot in the Timeline Tray

SYSTEM TRAYS

Next to Project and Gallery Trays SCRATCH offers the option for a third type of Tray: the System Tray. The System Tray works identical as the Gallery Tray but the gallery items in it are not stored with a single user but are available for any user using SCRATCH on the particular system. More so - when mapping the SCRATCH Users folder to a network drive you can share the System Tray between multiple SCRATCH systems. You enable the System Tray through the Advanced tab of the System Settings dialog - available from the System Settings menu in the Startup screen (see Chapter 3 - The Startup Screen).

04 - Command Menu

GENERAL

When you first enter the Player, the menu of the Player module is displayed. To navigate to the different SCRATCH toolsets you use the SCRATCH Command menu. In addition - the Player Menu bar has buttons to navigate back to the CONstruct, open the Trays or the Animation editor.

PLAYER COMMAND MENU

The Command Menu has two looks; Square and Circular. These can be set in the User Settings area - see Chapter 3 – THE STARTUP SCREEN.

Clicking on any of these buttons opens the interface menu for that toolset / module.

[Construct]

This option returns you to the **CONstruct** view. This is the same as pressing the CONSTRUCT button on the Menu Bar or using the Quick Key: F1.

Player

This option opens the Player menu to control an external deck for real-time layoffs directly out of SCRATCH. The details of the PLAYOUT interface are covered in depth in Chapter 11 – Utilities and Customization. In case you do not have SDI configured this menu only contains the generic Player tools.

Settings

This option opens the Settings menu - discussed later in this chapter.

Edit

This option opens the Edit menu. See Chapter 6– The Editor for a more in-depth look at the SCRATCH Edit toolset.

Matrix

This option opens the Matrix Color Grading interface. See Chapter 7– The Matrix and Chapter 8 – Layers for an in-depth look at the Matrix tools.

Process

This option opens the Process menu. See Chapter 9– Output and Processing for an in-depth look at the Process tools.

Keep

The **KEEP** button forces the Command Menu to remain visible at all times. When SCRATCH is run for the first time, the Command Menu is on-screen at all times. By deactivating the **KEEP** button, you can clear the Command Menu by swiping off the screen. Then you can call up the Command Menu, at any time, by right-clicking anywhere on the screen or swiping off the left or right sides of the screen. The **KEEP** button is only available on the square Command Menu.

- Quick Key: ` or ~   » Show the Player Command Menu

The square Player Command Menu can be repositioned on the screen by clicking on the gripper in the lower-right corner, and then moving the menu to a new location and clicking again to release. The circular Command Menu appears at the location where you right-click.

You can also use the following Quick Keys to switch to the various toolset menus:

- Quick Key: F1   » Exit to the CONstruct view
- Quick Key: F2   » Show the Player Menu

- **Quick Key:** F3   » Show the Settings Menu
- **Quick Key:** F4   » Show the Edit Menu
- **Quick Key:** F5   » Show the Matrix Menu
- **Quick Key:** F6   » Show the Process Menu

Note: The modules available from the Command Menu depend on what is licensed on the system.

05 - Player Settings

GENERAL

Clicking on the Settings button displays the Player's Settings menu. Here you can control various aspects of how the images are displayed within the SCRATCH Player.

The buttons on the left side of the Settings Menu give access to the different sub-menus. The labels show the current display resolution and refresh rate, and the resolution and frame rate of the current CONstruct.
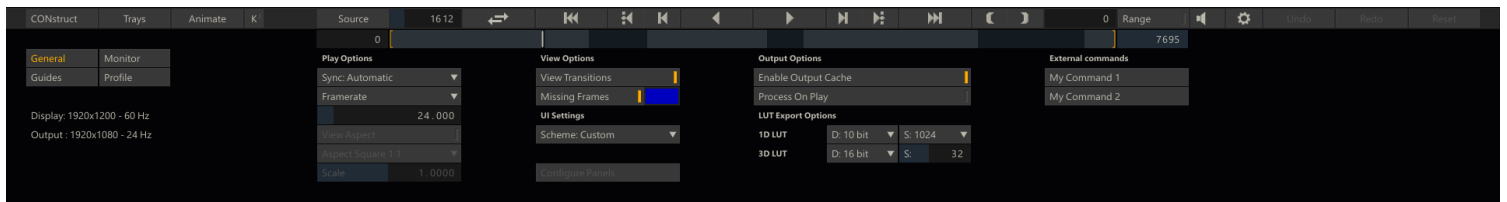
The General sub-menu is split into 5 sections; Play options, View Options, View Selection, SDI / Dual Head settings and on the far right controls for a Remote connection and Custom Command buttons.

PLAY OPTIONS

SYNC

This setting determines how SCRATCH synchronizes itself with the system's Vertical Synchronization Interval for play back. There are five options: Automatic, Timer, Monitor, Video and Audio. The proper setting depends on your particular play back needs.

Automatic

Automatic sync chooses the most appropriate method for synchronization based on the playback framerate. If the monitor frequency is an even multiple of the framerate of the Player, the monitor vertical sync interval is used as the SCRATCH refresh interval. If the monitor refresh differs from the framerate, Timer sync is used to maintain accurate playback timing.

Timer

Timer sync will run the SCRATCH refresh interval at the true framerate timing regardless of the monitor refresh rate. This results in accurate timings for playback but some visual tearing of the image may occur when a SCRATCH refresh does not coincide with the monitor refresh.

Monitor

The monitor vertical sync interval is used as the SCRATCH refresh interval regardless of the Player framerate. This will ensure a clean image during playback but may result in skipped frames or stuttering during playback in order to maintain proper playback timing.

Video

Video sync is used in conjunction with the SDI Output option. This option locks the SCRATCH refresh rate to the framerate set in the SDI control panel.

Audio

Audio sync runs the SCRATCH refresh interval at the true framerate to ensure synchronization with reference audio playback. Some visual tearing of the image may occur. This is similar to Timing sync.

FRAMERATE

The playback frame rate of the Player can be set in two ways. First, the FRAME RATE button is a pull-down menu of preset frame rates. Selecting any of these presets sets the Player's playback to that frame rate. You can also set the playback frame rate to any value by typing it into the Text Slate. The frame rate can be changed at any time, even while the Player is in play mode.

VIEW ASPECT

The VIEW ASPECT button toggles any aspect ratio adjustment on and off. This is useful for checking source images without any aspect ratio compensation by SCRATCH.

ASPECT SELECTION

This pull-down menu allows you to select the aspect ratio for the Player. The options for this pull-down are read from the aspects.cfg file and follow the same usage as the Project aspect ratio settings. For details on working with aspect ratios, see the PROJECT SETTINGS MENU section in Chapter 3.

SCALE

The **Scale** Numerical Slate is used to set custom aspect ratios as part of the Player's aspect ratio setting. Changing the Scale value by entering a new value in the Numerical Slate will automatically switch the aspect ratio to Custom.

VIEW OPTIONS

VIEW TRANSITIONS

View Transitions allows any transitions that were applied between shots to be enabled or disabled. This can be especially useful when grading individual shots, so that the transition does not interfere with the grading.

MISSING FRAMES

When active, the **Missing Frames** button replaces the image in the View Port with a selected color any time the SCRATCH play cursor passes over a frame, for which there is no source material available. The color to be used can be set by clicking on the Color Chip, located just below the **Missing Frames** button.

Note: If the **Missing Frames** button is activated, the image freezes on the closest available frame that does exist. This can be an issue when checking a Conform for validity. In this case, it is best to have Missing Frames active, so that it is very clear when a source frame is not available.

USER INTERFACE SETTINGS

INTERFACE SCHEME

The Scheme pull-down allows you to quickly switch the SCRATCH user interface between the default Color scheme, a gray-scale Mono scheme and a Custom color scheme. The Mono scheme is a monochromatic interface scheme which eliminates all color from the SCRATCH interface to minimize color bias. The Custom scheme allows you to define custom colors for each interface element. Customizing the SCRATCH user interface is covered in detail in Chapter 11.

Note: The selection you make in the pull-down will alter the SCRATCH interface throughout the software, not just in the Matrix.

UI HIGHLIGHTS

The UI Highlights button toggles between flat and 3D shading on the Tracker Balls. This only affects the Tracker Ball appearance in the interface; it does not affect how the Tracker Balls function.

CONFIGURE PANELS

The CONFIGURE PANELS button opens a dialog box where you can control how SCRATCH commands are mapped to an external control surface, such as the Tangent Devices or JL Cooper panels. See Chapter 11 – Utilities and Customization for more information about setting up and using the external control surfaces.

OUTPUT OPTIONS

ENABLE OUTPUT CACHE

If the **Enable Output Cache** setting is enabled SCRATCH will check if a frame that is to be displayed has already been rendered to file / cached. If that is the case SCRATCH will use that frame rather than processing the original source media and applying grades / composite. Any change to a shot (e.g. adjust its grade) will automatically invalidate the cached / rendered files and SCRATCH will use the source media again.

PROCESS ON PLAY

When the **Process On Play** option is enabled - each frame of the timeline that is played in the Player is also written to disk. This is an easy way to render out (part of your timeline) while maintaining an interactive system. Frames that have been rendered out and not changed are not rendered out again. Shots that have been updated are rendered out again - overwriting the previous version. Together with the **Enable Output Cache** setting you can ensure playback performance.

LUT EXPORT SETTINGS

There are individual areas for controlling the size and resolution of 1D and 3D LUTs that are generated and saved from SCRATCH.

1D LUT SETTINGS

The Depth and Size parameters (**D:** and **S:** in the interface) in this section control how a 1D LUT is generated when the **Save** function is used.

The **D:** parameter is a pull-down menu to choose the bit-depth for the resulting values in the LUT. The choices are: 8-, 10-, 12- and 16-bits.

The **S:** parameter is a pull-down menu to choose the number of entries in the resulting LUT. The choices are: 256, 1024 and 4096. This value represents the precision of the generated LUT. The higher the number, the more precise the LUT. However, more precision generates a much larger LUT file.

3D LUT SETTINGS

The 3D LUT Settings have Depth and Size parameters similar to the 1D LUT.

The Depth parameter has the same options of 8-, 10-, 12- and 16-bits as the 1D LUT and functions in the same way to determine the bit-depth of the resulting values in the LUT.

The Size parameter is an incremental value that can be set between 8 and 64. This determines the number of divisions on each axis of the 3D cube, which defines the LUT. The higher the number, the more precise the LUT. However, more precision generates a much larger LUT file.

EXTERNAL COMMANDS

As described in Chapter 04 - The CONstruct, you can add a one or more custom command buttons to the SCRATCH interface to start external applications. Any Custom Command buttons created are shown in this section of the Player. How to add custom command buttons is described in Chapter 11 - Utilities and Customization.

06 - Monitor

GENERAL

The Monitor menu is split in three section. The first two sections contain almost identical settings for the (main) Interface monitor and Dual Head (reference) Monitor. In addition, for some settings on the the (primary) Interface monitor you specify to how they apply to the (left) Working- and (right) Dual-view. The third section contains additional settings specific for a second monitor. All values set in this menu apply to the entire project. Both Dual Head/SDI sections are only available if you have an SDI monitor setup or have enabled the Dual Head option in the System Settings menu.
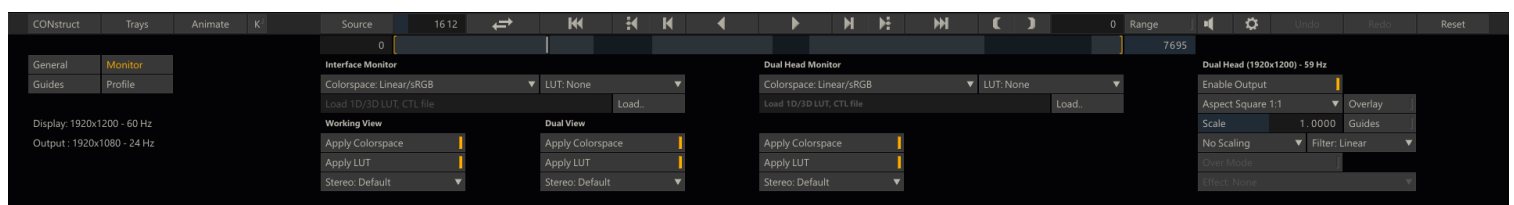
INTERFACE AND DUAL HEAD MONITOR

COLORSPACE

A monitor in SCRATCH has - similar to any node - a colorspace associated with it: Linear/sRGB, Log/Film, Rec709, Ultra HD, P3 (XYZ) or Wide Gamut. This colorspace determines if / how SCRATCH converts the source image.

LUT

For each display you can set a Display LUT using the **Load** button. By default the LUT for your main monitor is applied to both views in dual view mode but using the Apply buttons you can switch off the LUT for either one view.

APPLY COLORSPACE

By default if the color space of the node being viewed differs from the color space of the monitor that you set - SCRATCH will perform a color space conversion. By disabling the **Apply** button SCRATCH does not perform a conversion. You can toggle this setting for each view separately in a dual view mode on the main monitor.

APPLY LUT

This button toggles the application of the LUT - set above this pattern - on/off. You can toggle this setting for each view separately in a dual view mode on the main monitor. See Chapter 11 - Customization for information on various supported LUT formats.

STEREO PATTERN

This pull-down determines the stereo pattern that SCRATCH will send out to the monitor / output device when you playback a stereo node in the Player. For more information on Stereo projects see Chapter 9 - Processing and Plug-ins. You can toggle this setting for each view separately in a dual view mode on the main monitor.

ADDITIONAL DUAL HEAD/SDI CONTROLS

In addition to the Color Space, LUT and stereo Mode options - the Dual Head / SDI monitor has a number of additional controls associated.
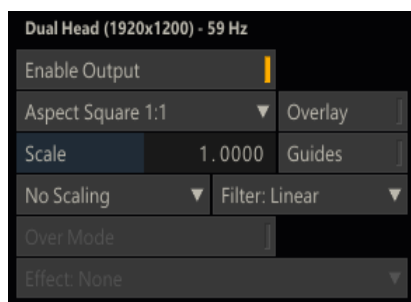
ENABLE OUTPUT

Button to switch on/off the dual view; if switched off the second output will show the SCRATCH logo (or alternate logo if setup).

ASPECT SELECTION

This pull-down menu has the standard SCRATCH aspect ratios that are set in the aspects.cfg file. This will control the aspect ratio of the full-screen output. You can also enter a Custom Scale factor using the Numerical Slate.

OVERLAY

This button will toggle SCRATCH interface overlays so that they are visible on the full-screen output.

SCALE

The Scale is a manual control for custom aspect ratios for the full-screen output.

GUIDES

This button will toggle SCRATCH guides so that they are visible on the full-screen output.

NO SCALING

This button bypasses the Scale adjustment set in the aspect pull-down.

FILTER

This button will set the filter type used for scaling the image on the full-screen output. The different filters were already discussed in Chapter 04 - The CONstruct, in the Output Menu paragraph,

OVER MODE

When enabled, the SDI / dual head monitor will display the wipe overlay when switching the main interface monitor in Over-mode.

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o Quick Key: F11   û Toggle Drop Mode on / off

EFFECT

The Custom Control interface, discussed in more detail in Chapter 11 - Utilities and Customization allows you to specify a (third party) plug-in to be applied solely to the second monitor. If such Custom controls are specified, an additional Effect list-control is shown below the **Wipe** button where you can activate one of the plug-ins; note that only one plug-in can be active at any time.

07 - Guides

GENERAL

The Guides menu is a sub-menu of the Player Settings menu and is divided into two sections: Guide Presets & Settings and Display Options.
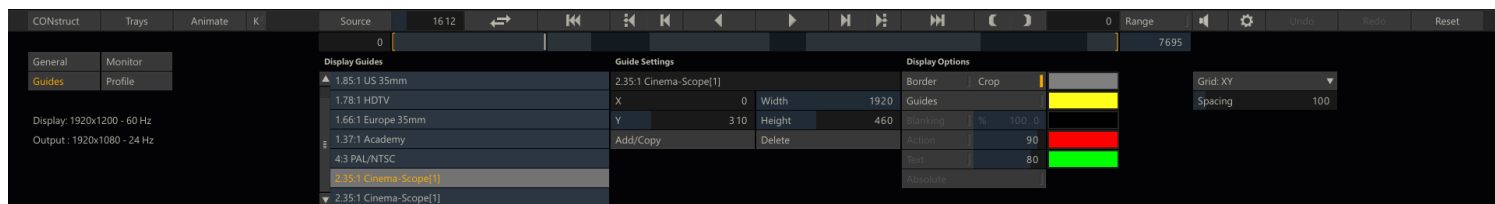
The Guides settings are stored per CONstruct.

GUIDE PRESETS AND SETTINGS

Guides are on-screen displays that can be used to visualize different rectangular areas of interest on an image. Guides are commonly used to show aspect ratios to be extracted from the current CONstruct, or customized positions within the image. They are completely flexible and customizable to the specific needs of your production.

ACTIVATING PRESET GUIDES

To activate a guide, select one of the presets from the list on the left side of the Guides menu. The guide can then be turned on in the interface by activating the **Guides** button in the Display Options section. You can switch guides at any time by selecting a new preset from the list.

CREATING CUSTOM GUIDES

A guide is made up of several parts, or Cages: the base guide area, blanking, action and text safe regions. Each of these Cages can be customized separately from within the Guides menu.

To create a custom guide, first select an existing preset and press the Add/Copy button. This creates a new guide in the list with the same base name as the preset from which it was copied. You can rename the guide by clicking in the Text Slate and typing a new name.

Now you can modify this guide using the X, Y Width and Height Numerical Slates. A guide has an anchor point, which is the lower left corner of the rectangular area; it is defined from that point by Width and Height. All values are specified in pixels.

Specify the values you want to use for each parameter. The guide updates immediately with the new values.

If you want to delete a custom guide, select it from the list and press the Delete button.

Note: Only user-created custom guides can be deleted; the standard presets cannot.

DISPLAY OPTIONS

The Display Options section of the Guides menu controls which Cages of the guide will be visible. Clicking on a button activates that particular Cage.

Each Cage can have its own color, which is set with the color pot to the right of each display option. Clicking on one of these color pots opens the Color Selection Palette where you can choose the color for that particular Cage.

You can also adjust properties of certain Cages, such as the opacity of the Blanking, the percentage size of the Action, and Text safe areas by entering new values into the Numerical Slates for each part.

BORDER

The Border corresponds to the working resolution of the CONstruct. This Cage gives you a visual representation of the total area that is processed as an output by SCRATCH.

CROP

When the Crop button is active, any portion of an image that extends beyond the Border Cage is blanked out so that it will not appear in the interface. If Crop is deactivated then you see the portion of the image that extends beyond the Border Cage; it will be darkened slightly so that it is visually different than the portion of the image within the Border Cage.

GUIDES

Activating the Guides button turns on the currently active guide from the preset list. This is the overall on/off button for Guides. Each Cage such as Blanking, Action, and Text has its own separate button, so that each individual Cage can be turned on or off as well.

BLANKING

Blanking determines whether or not the area of the image outside the currently selected preset guide is blanked out. Blanking is used in many cases to create letterboxed or matted images representing alternate aspect ratio versions.

The blanking option also has an opacity setting that allows you to control how much of the blanking color is mixed in with the image.

Note: The Blanking button is only available if the overall Guides button has been activated.

ACTION

The Action button toggles an Action Safe Cage. This Cage is designated as a percentage of the image size. This Cage is generally used in video production where the image is over-scanned, so that a portion of the total image is not visible on consumer television sets.

TEXT

The Text button toggles a Text Safe Cage. This Cage is designated as a percentage of the image size. This Cage is generally used in video production to designate the limits at which text can be placed, so that it will be clearly visible on consumer television sets.

ABSOLUTE

Activating the Absolute button changes all values for the selected Guide to use an absolute pixel count for the positioning of guides. With this option turned off, guides are scaled to match the resolution and aspect ratio of the current CONstruct.

08 - Profile

GENERAL

By selecting the Profile button at the left of the Settings Menu, the Profile panel appears.

Through this panel you can perform a series of benchmarks test to determine the capabilities of the system you are running SCRATCH on. Clicking the Start button will start execution of the tests. The test results are presented on screen as well as logged to the general SCRATCH log file. Besides that, you can save the results to a separate file by clicking the save button. The results can be used to help troubleshoot performance issues or test optimization methods.

Tip: After installing SCRATCH on a new system, create a profile and save this for future reference. Optionally you can create a series of profiles with different source material (HD, 2K, 4K) to get an even better comparison base.

On the right of the Profile panel are buttons to start the individual tests that make up the profile.

- Benchmark TX - test data transfer performance of current image from main memory to GFX to screen.

- Benchmark IO - test the read performance of the current shot from disk to main memory.

- Benchmark Copy - test performance of main CPU memory.

- Benchmark Read - test the read-back performance of the current image from GFX memory back to main memory.

- Benchmark Render - test the full render pass of the current shot; from main memory to GFX, apply grading and read back to main memory (no disk IO).

- Benchmark Disk IO - test read and write test from disk to main memory and vice versa; use a fixed size color frame to make test comparable between systems.

The results of some of the benchmarks depend on the footage loaded in the Player. different types of material might produce different results. When writing a profile to a separate file, general info on build, CPU, memory and GFX, as weel as info on the current clip in the Player is also included in the profile.

09 - Audio Panel

GENERAL

The Audio Panel is displayed using the **Mixer** button on the View Port toolbar or by using Quick Key: Ctrl + 5. All the functions of Player Audio Panel are split up over three tabs:

- Mixer; volume control
- Details; settings audio slip and using the auto-sync option
- Settings; device selection and channel mappings

• Quick Key: Ctrl + 5	» Show / Hide the Audio Panel

VOLUME CONTROL

SCRATCH supports a maximum of 16 audio channels. You can set the audio level for each of the channels with the slider control next to it. The VU meter show the level when playing.
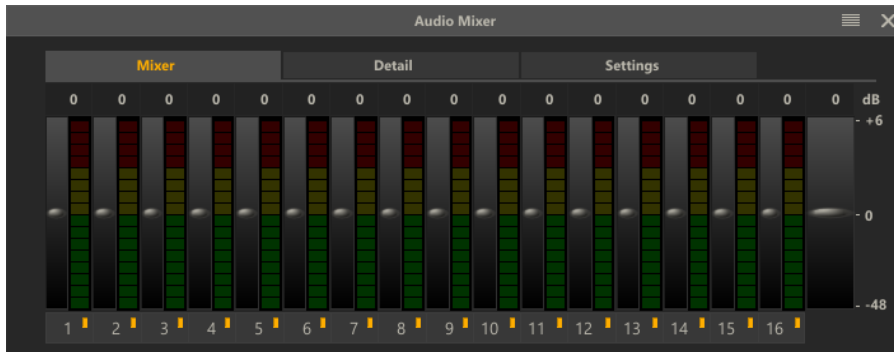
With the buttons underneath the sliders you can **mute** a channel. With the **Master Volume** slider at the far right you manage the overall audio level. Changing this will change the individual channels proportional. The **Master Volume** is available on all tabs.

AUDIO SLIP

The Detail tab displays a wave form of the current audio linked to the timeline or current shot (see Chapter 4 - The CONstruct or Channel 6 - The Editor on how to load and link audio). The red marker indicates the current play position. With the numeric control or slider control above the wave worm you can set the detail level; the numeric value represents the number of milliseconds of audio displayed. The wave form on;y includes active channels.

To set the audio slip you click inside the wave form panel and drag the wave form left or right. Alternatively you can use the **Auto-Sync** options. Selecting the right or left arrow-button will search for the next or previous **peak** in the wave form and update the slip. This can be used for automatic clapper detection.

Alternatively by selecting the **Auto-Sync** buttons while holding down the **Control-key** will slip the in-point of the current shot - rather than the audio. When SCRATCH finds a peak it calculates the number of frames from the current position and updates the in-point accordingly. Any remaining milliseconds are set as audio slip.

AUDIO SETTINGS
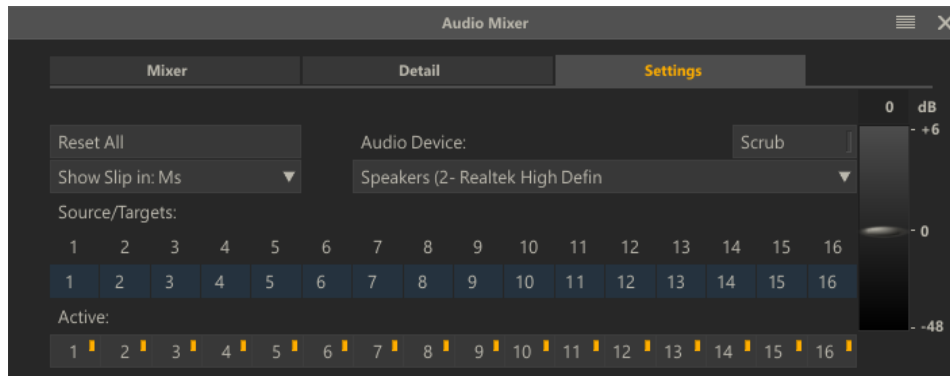
Reset All

Reset all channel mappings and volume controls to their default values.

Show Slip

Project wide setting whether an audio slips in SCRATCH are displayed in milliseconds or in (video) frames.

Channel Source/Target Mappings

You can map every channel in the source file to any channel on the output device. However, you can not combine multiple source channels into one target channel.

Audio Device

Select one of the available audio devices on the system; either a regular audio device or embed audio with your SDI output signal.

Scrub

Enable / disable audio scrubbing when you shuttle through the timeline. Note that not all devices might allow audio scrubbing - e.g. this feature might not be available for some SDI boards when embedding audio in the SDI signal.

10 - File-Based Player

GENERAL

Once the SCRATCH software is installed, certain media file types (e.g. .CIN, .DPX or .r3d) are automatically associated with the ASSIMILATE File Player. These files show a SCRATCH Player icon in Windows Explorer / Apple Finder.
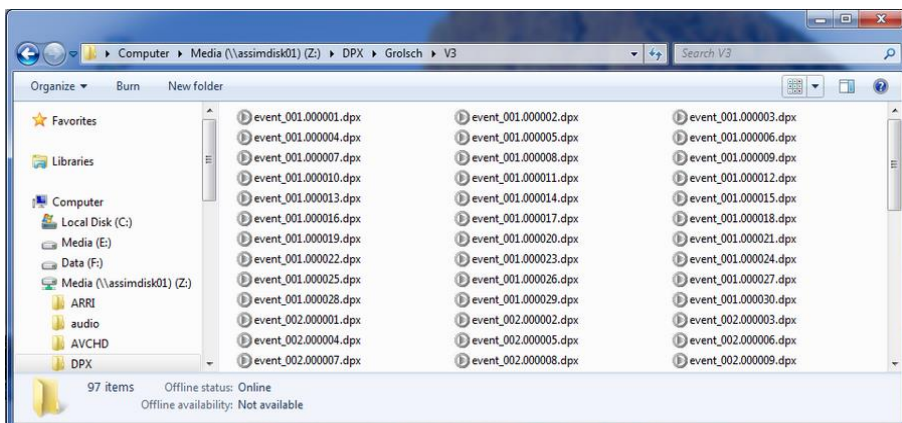
The ASSIMILATE File Player is a limited version of the SCRATCH Player.
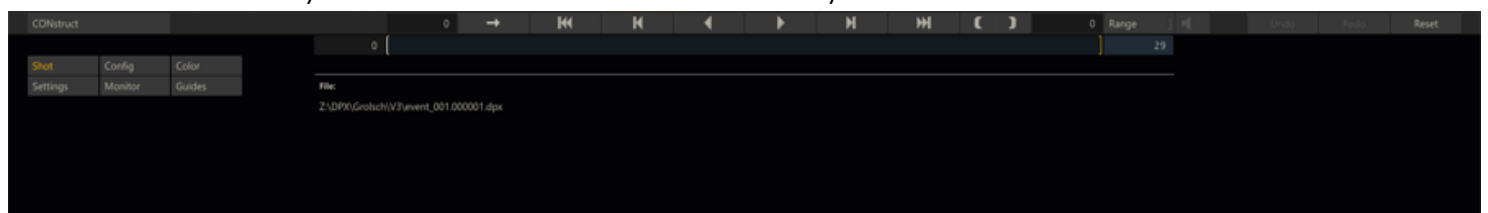
LOADING A SEQUENCE

Double-click on any file in the sequence and the File Player is launched with the entire sequence loaded.
Once in the Player, you have all the playback controls that are normally available in the SCRATCH Player for moving through the file sequence.

Note: You cannot run SCRATCH and the File Player at the same time.

PLAYER MENU

By default the Player imenu is active withfor Play-out to vcr. However, if no vcr is configured and connected the buttons are disabled.

SETTINGS, LUT, GUIDE AND PROFILE MENUS

The File Player has a Settings menu where you can set options for playback sync, frame rate, and other parameters. This menu is similar to the regular SCRATCH Player Settings menu. The menu also includes the LUT, Guides and Profile sub-menus.

EXITING THE FILE PLAYER

To exit the File Player, use the Exit button on the main menu bar or use the Command Menu by right-clicking and select **[EXIT]** .

06 - The Editor

01 - Introduction

GENERAL

The SCRATCH Editor module provides non-linear editor functionality in a multi-layered timeline environment. Also, when switching to Source-mode in the Player, the module shows and allows you to edit the timings of your composite elements.
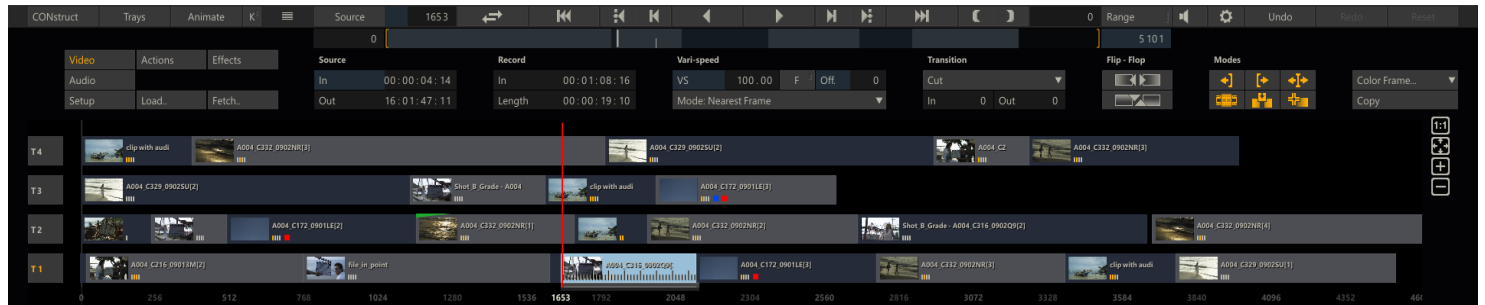
One of the main differences of the Edit menu as compared to other menus in the Player is that you can re-size the menu panel, By clicking the gripper next to the Animation button and dragging it up or down you can change its vertical size.

The Edit panel itself consists of two sections - the top part with the controls and the lower Edit Panel with the timeline edit bars which re-sizes with the menu panel as a whole.

SHUTTLE

The longer vertical red line is the current frame position marker. This indicates which frame is currently being shown in the View Port. The frame position marker also determines the currently selected clip and slot. Clicking anywhere in the editor panel will change the frame position. Alternatively you can place your cursor over the red frame position marker. The cursor switches to the Shuttle cursor, and you can click and drag the frame position marker to any point in the timeline. The red position marker is linked to the mini-timeline underneath the Play controls.
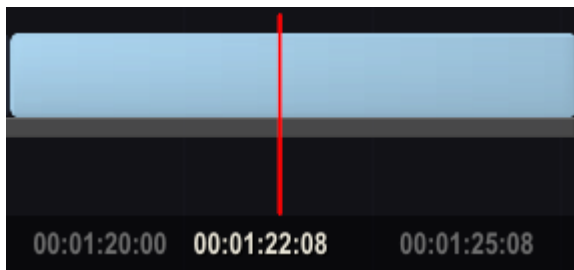
At the bottom of the Edit panel the current position is either displayed as timecode or as frame number. The format is linked to what you have set for the View Port Toolbar info panel (middle part of the toolbar). See chapter 5 - The Player for changing the displayed information and format.

TRACK SELECTORS

At the far left of the Edit Panel the Track Selectors are displayed. The Track Selectors were already discussed in Chapter 5 - The Player.
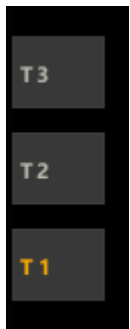
ZOOM AND PAN

The Edit Panel re-sizes with the Edit menu as a whole. You can also pan and zoom the timeline in the Edit Panel interactively, using a set of Quick Keys or use the zoom buttons on the far right of the Edit Panel.

• Quick Key: Alt + Drag Left/Right	» Zoom the Timeline in or out
• Quick Key: Spacebar	» Pan across the Timeline
• Quick Key: Home	» Zoom out to display the entire timeline
• Quick Key: Alt + Home	» Zoom so that the current shot fills the width of the Edit menu.
• Quick Key: '+'	» Zoom in on the whole timeline.
• Quick Key: '-'	» Zoom out on the whole timeline.
• Quick Key: Alt + Mouse Wheel	» Zoom in / out on the whole timeline.

Zoom out on the Timeline. This always zooms around the current frame position, which will become centered in the Timeline.

Zoom in on the Timeline. This always zooms around the current frame position, which will become centered in the Timeline.

Zoom out to display the entire timeline.

Zoom so that the current shot fills the width of the Edit menu.

02 - Interactive Editing

GENERAL

In the Edit Panel you can setup and adjust the timeline by extending, shrinking, inserting and moving tracks, slots and shots using drag and drop rather than using the controls. This paragraph covers the different gestural actions.

SLOTS

EXTEND, SHORTEN, MOVE

You can extend or shrink a Slot by clicking it at either end and dragging it left of right. When you click the middle section of a slot and drag it left or right you move the slot as a whole. You can also pick a slot up and drag it to another position on the same or other track.
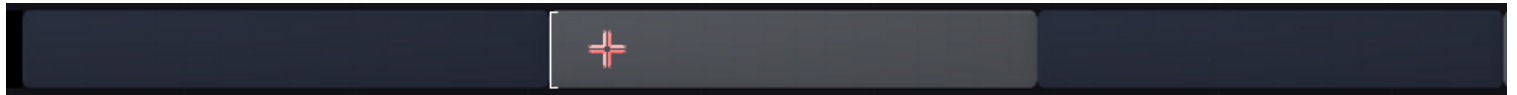
An important determent in how these actions behave are the Edit Modes which you can toggle in the Video menu or using the quick keys.

Reveal Previous shot - Quick key: 5; link the slot-in with the slot-out of the previous slot. Shortening a slot by dragging its in-point right will automatically extend the previous slot.

Reveal Next shot - Quick key: 6; link the slot-out with the slot-in of the next slot. Extending a slot by dragging its out-point will automatically shorten the next slot.

Ripple - Quick key: 7; any changes to the current slot duration ripple down the timeline. This causes all slots after the current slot to be shifted in time by the amount the current slot was lengthened or shortened.

Reveal Media - Quick key: 8; maintain media while slipping the slot.

Insert vs Overwrite mode - Quick key: 9.

Enable / Disable drag mode - Quick key: 0.

137

When hovering the mouse above a slot on the timeline the Reveal Prev / Next and Ripple Modes are displayed above the slot ends:

- Reveal Previous On / Off: display '<' or '|' at the left edit.

- Reveal Next On / Off: display '>' or '|' at the right edit.

- Ripple On / Off: display '>' or '|' at the right edit (together with the Reveal Next Mode).

-
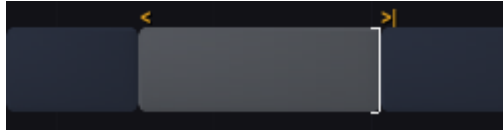
REVEAL PREVIOUS / NEXT MODES

With the Reveal Previous / Next and Ripple options off - the slot is bound to the positions of the prior and next slots. With these modes on, adjust the slot in / out position might effect the next or previous slots. The examples below make their function clear.

Reveal Previous On: Dragging in-position of slot to the right and as a result the previous slot's length increases.
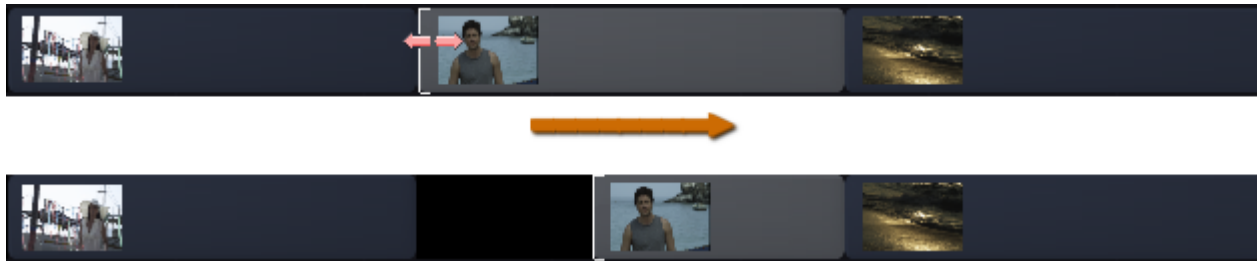
Reveal Previous Off: Dragging the in-position of the slot to the right, but now the previous slot is not linked - leaving a gap.

SLIPPING MEDIA

The current selected slot is displayed with a grey bar below it - indicating the length and position of the actual media. If the source clip is longer than the current slot, a smaller gray bar extends under the edit bars to show you how many frames are available before and after the current slot.
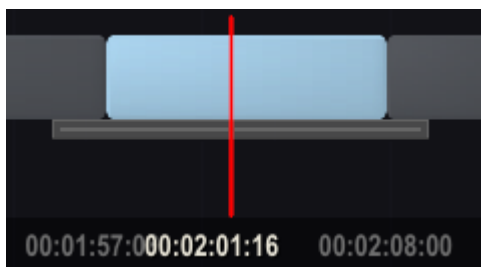
You can slip the source shot by holding down the shift key and dragging the slot left or right. While dragging a ruler is draws showing you how many frames you are slipping.
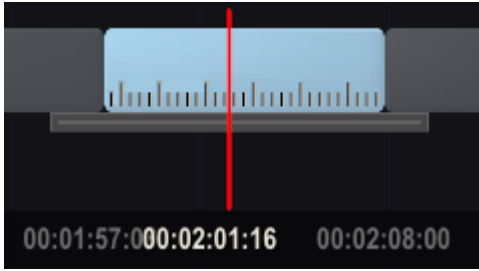
00:01:57:00 **00:02:01:16** 00:02:08:00

You can also use the Quick Keys to slip a shot one frame at a time.

• Quick Key: < or ,	» Decrement the Slip value
• Quick Key: > or .	» Increment the Slip value

Another way to slip source media is to use the Reveal Media Edit Mode. When this mode is enabled and the duration or position of a slot is changed, the in-point of the source shot is changed in the reverse. The examples below show the effects of the Reveal function when moving an edit point.
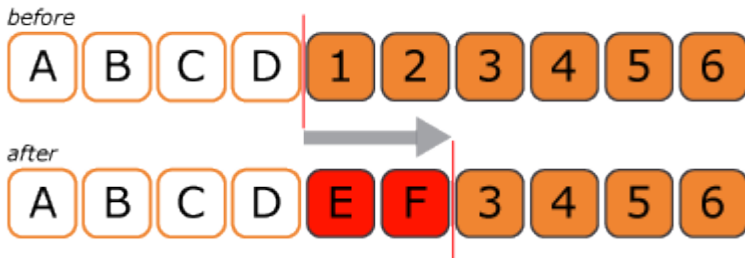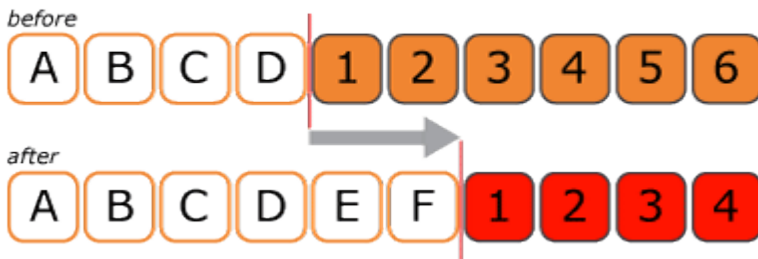
SELECTION

The current slot is determined by the Play position and the current selected track. You can however select multiple slots. E.g. to remove multiple shots at once, to start a drag drop action or to create a Collector node. To select multiple slots you either click additional nodes by holding down the Ctrl-key or by starting an area-drag by holding down the Ctrl-key and starting a drag between to tracks and dragging the pen across a section of the Edit panel.
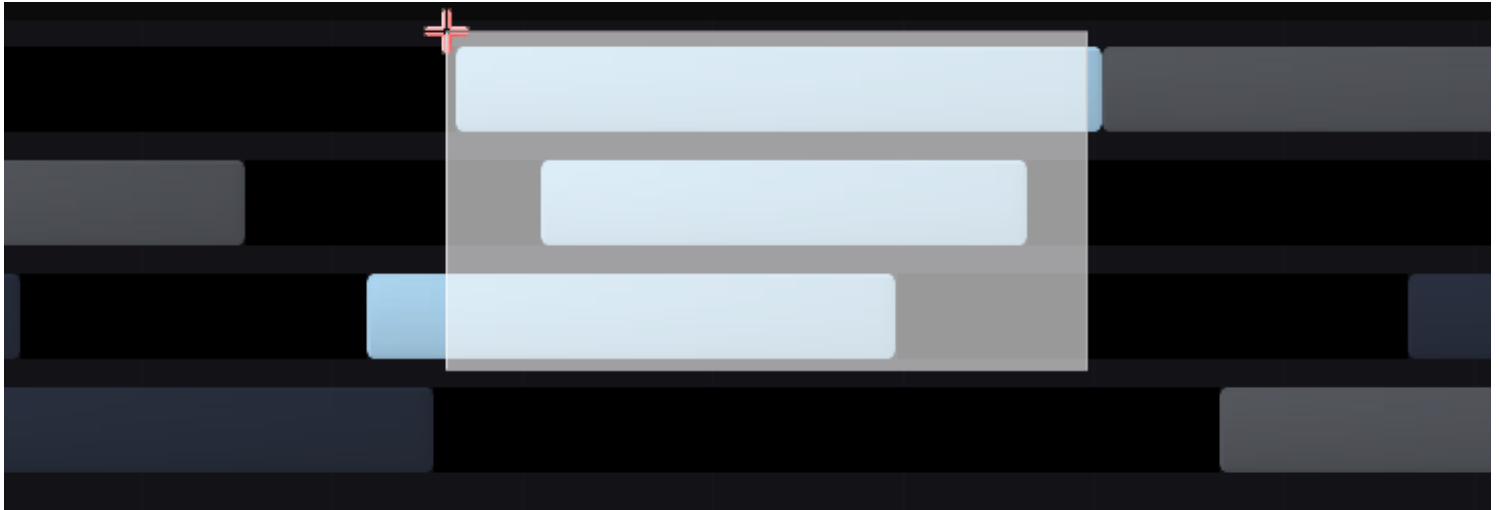
To remove a multiple slot selection you click anywhere in outside the selection..

DRAG DROP SLOT

You can pick up a slot by clicking it and holding down the mouse momentarily. Make sure the Enable Drag Edit Mode is switched on. Once attached to the pen you can drop a shot at any position. The green line that appears while dragging an item indicates the drop position and timecode at that position. The drop overlay indicates the location / length of the element being dragged.

The drop behavior depends on the Drop Edit Mode: Insert versus Overwrite. The example below shows the difference.
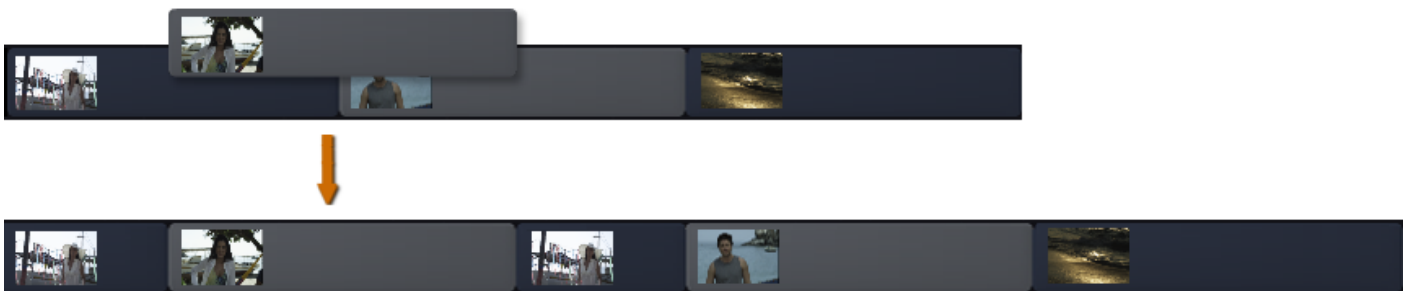
When Insert Mode is set - the current slot at the drop position is split and the drop slot is inserted in between.

In Overwrite mode - the doped slot just overwrites whatever is there as from the drop location.

DRAG DROP TRACK

You can also drag and drop a complete track to a different position. By holding down the mouse on a Track Selector it will attach itself to the pen. You can then drop it above or below another Track selector to move it to that position.
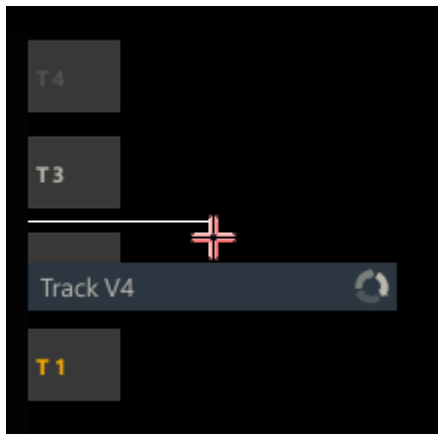
Note that you can not change the position of the main track or move any sub-track before the main track. also note that eh numbering on the Track selectors remain the same - as that always uses sequential numbering.

DRAG DROP COPY

All drag actions started in the Edit Panel are by default a move of the element. However, if you click the **Copy** button in the Video menu while dragging an element the original element will remain when dropping the item.

Note that you can also use the Copy button to attach the current slot (selection) to the pen.

NOTES

Using Quick key: N while hovering over a shot in the editor will popup the Note Editor for entering and reading annotations.

• Quick Key: n	» Popup note editor with a shot

LOAD AND FETCH

Using the **Load** or **Fetch** buttons you can get a reference to a new shot which you can drop in the desired location in the editor. Use the **Fetch** button to get a shot from a CONstruct in the project. The **Load** button will open the file browser to select a new shot from disk.

Note that when you pick up shot it will use the local in- and out-points to determine the drop-length.

03 - Video

GENERAL
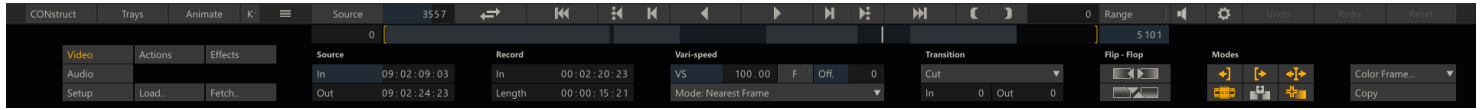
The Video menu allows you to control the timings and appearance of shots on the timeline.

SOURCE

IN

This represents the first frame of the source clip being used within a particular edit segment. This number is an absolute frame count from the beginning of the source clip.

OUT

This represents the OUT point that is being used on the source clip. This number does not necessarily correspond to the last frame being used in the slot, but rather the last frame of the clip that is used to fill the slot. If the OUT point is less than the duration of the slot, the image freezes on the OUT frame for the remaining duration of the slot. If the OUT point is greater than the duration of the slot, the clip behaves as normal. This number is an absolute frame count from the beginning of the source clip.

When slipping the outpoint before the actual media length a black line will appear indicating that there is media left after the out-point. When the outpoint is set beyond the actual media length a blue line appears, indicating that this will result in 'missing frames'; In the Player Settings menu you can configure SCRATCH to show blue frames for missing frames or just repeat the last known frame. You can also set the color there - which will also be used in this case. Blue is the default.
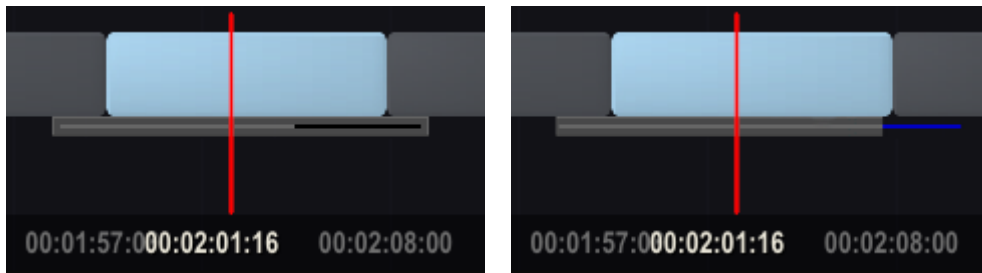
You can also use the Quick Keys to slip a shot one frame at a time.

- Quick Key: < or ,   » Decrement the Slip value
- Quick Key: > or .   » Increment the Slip value

RECORD

In

This Numerical Slate indicates the absolute frame number in the timeline where the current slot begins. You can change this number and the start point for the current slot adjusts to the new value. The source clip maintains the same IN point so that the first frame of the slot is the same source frame.

LENGTH

This value indicates the total length of the current slot. You can change this number and the overall length of the current slot adjusts to the new value. The behavior of slots after the current slot is determined by the status of the Ripple button in the Configure Timeline section.

VARI-SPEED

VS (Variable Speed)

This Numerical Slate represents the speed of the current shot. Depending on the **F** toggle button to the right of the numeric slate - the speed is displayed as a percentage (off) or as a framerate (on). A negative value represents reverse playback of a clip. To create a single frame edit or freeze frame use a value of 0.

OFFSET

The Offset Numerical Slate is intended to determine where SCRATCH starts evaluating a variable speed. For example, if a shot is 100 frames long and you have slipped the shot 10 frames, and then set a variable speed of 50 percent, moving the Offset to 10 ensures the first frame you indicated is truly the first frame that appears in the edit. If the Offset is left at zero,

the variable speed is calculated from the beginning of the entire shot. The first frame ofthe edit is then the fifth frame of the entire shot since the variable speed is calculated from frame zero.

MODE

The re-timer type SCRATCH will use: Nearest Frame or Rolling Mix. In the former mode SCRATCH will simply skip / repeat frames. The Rolling Mix will blend frames together.

TRANSITION

PULL-DOWN

This pull-down allows you to define the type of transition between the previous slot and the current slot.

Cut

This defines the transition as an instantaneous change from one shot to the next.

Dissolve

This defines the transition as a video-style dissolve with one image disappearing as another appears.

Optical

This defines the transition as a more traditional film-styledissolve, simulating the optical process of printing each image ontofilm.

Additive

This defines the transition as an additive-mix-style dissolve, wherethe incoming and outgoing images are mixed together using an additivemethod. The result is bright areasremaining bright for longer thandarker areas of the image.

IN

This Numerical Slate defines the number of frames before the editpoint that are used for a dissolve transition.

OUT

This Numerical Slate defines the number of frames after the editpoint to be used for a dissolve transition.

A Dissolve Transition is displayed in the Edit Panel by a green triangle above the editpoint.

FLIP FLOP

HORIZONTAL AND VERTICAL SCALING

Source images can be "flipped" along the horizontal and/or vertical axes using the following buttons.

HORIZONTAL

 – This scales the image by -100 horizontally.

VERTICAL

 – This scales the image by -100 vertically.

Note: The"flipping" of the image is done using the horizontal and verticalscaling in the Shot Framing parameters forthe source clip. These buttons are nothing more than quick ways ofsetting the scale values to -100 in the corresponding axis. Keep this inmind as you work with shots that have beenchanged in this way.

OTHER FUNCTIONS

COLOR FRAME

Create a new color frame and attach it to the pen for dropping at a particular position in the timeline. The offers the same functionality as the corresponding button on the Media menu of the CONstruct as described in Chapter 4.

COPY

This button will copy the current slot (if not empty) and attach it to the pen. Alternatively if you are dragging a shot, slot or even a track and click the button - the move action is changed into a copy. Meaning that if you drop the shot or track it will create a copy of the item and leave the source as is.

04 - Actions

GENERAL
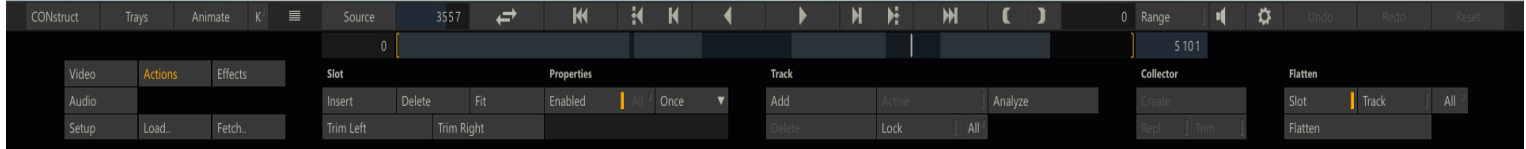
The Actions menu allows you to manipulate slots, tracks, collector nodes and the timeline as a whole.

SLOT

INSERT

Insert an edit in the current position - splitting the current slot. Quick Key: INS.

DELETE

Delete all the selected slots. Quick Key: DEL.

FIT SHOT

Adjust the length of the current slot to match the IN and OUT points of the shot. Quick Key: F.

TRIM LEFT / RIGHT

The trim function removes the left / right part of the current shot from the current frame position. Quick Keys: [and].

ENABLE / DISABLE

This button Enables / Disables the current slot. Disabling slots was already described in Chapter 4 - The CONstruct. Disabling a slot means that it will be skipped on regular playback. When the disabled slot is on the main track the play position will jump over the slot. If the slot is on a sub-track the slot and its content will just be ignored. A disabled slot is displayed with a red line below it.
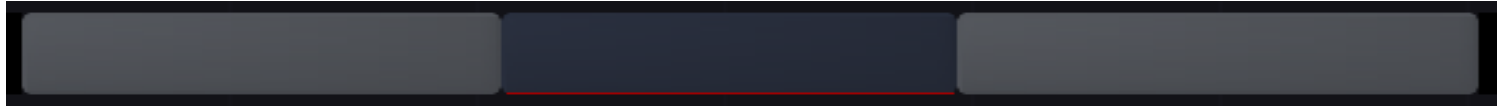
LOOP MODE

The LOOP MODE controls how a shot behaves if the slot is longer than the actual source clip's IN and OUT points.

- **Once**: The source clip plays normally until the source OUT point is reached. After that point, the final image is held as a freeze frame until the end of the slot.
- **Loop**: The source clip plays normally until the source OUT point is reached. After that point, the clip loops back to the source IN point, and continues looping in this way until the end of the slot.
- **Bounce**: The source clip plays normally until the OUT point is reached. After that point, the clip plays in reverse until the source IN point is reached. The source clip continues to 'bounce' in this way until the end of the slot.
- **Reverse**: The source clip plays in reverse, beginning at the source OUT point and playing backward until the source IN point is reached. After that point, the IN point image are held as a freeze frame until the end of the slot. This is essentially the same as the ONCE mode, but in reverse.
- **Reverse Loop**: This is the same as the LOOP mode, but in reverse.
- **Reverse Bounce**: This is the same as the BOUNCE mode, but in reverse.

TRACK

ADD

Adds a new track to the multi-layered timeline.

DELETE

Remove the current selected track. Note that you can not remove the main track.

ACTIVE

Toggle the current track active / inactive - and as such not included in the main output. Note that you can not inactivate the main track.

LOCK

Lock / unlock the current track (or all tracks if the All button is enabled). Locking a track means that you can not change the timings of the track. Locking a completed timeline will prevent accidental changes. The lock function can also be managed from the Settings menu in the CONstruct. When a track is locked, the track selector is displayed with a lock in it.

ANALYZE

The Analyze button opens the Shot Analyzer dialog to divide a single shot with multiple scenes up in individual cuts.
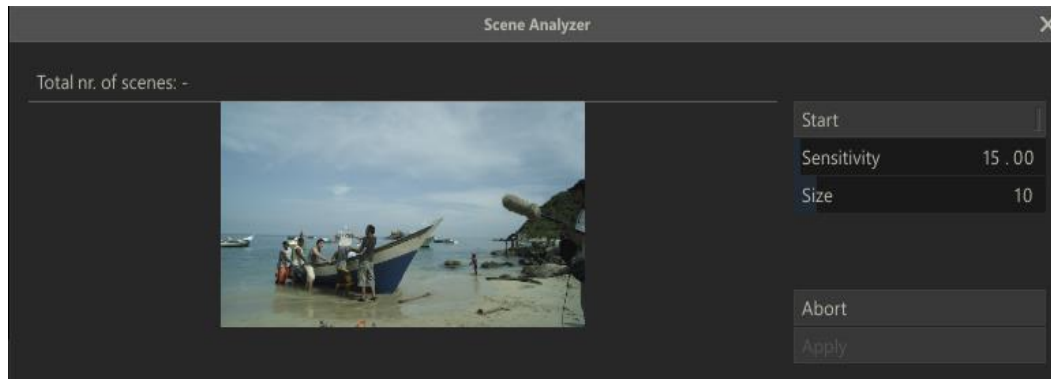
Analyzing a clip has two steps: the initial analysis and then setting the Sensitivity and Size values, which determine where SCRATCH inserts edits.

To start the initial analysis, press the Start button in the ShotAnalyzer window. This begins the analysis of the current clip. Don'tworry about the Sensitivity and Size parameters. They do not affect the analysis.

A green graph begins to appear in the bottom of the Shot Analyzerwindow. This graph shows the differences that SCRATCH is detectingbetween frames. Large vertical spikes indicate big changes in the image,which are usually indicative of a change of scene within the clip.

You can stop the analysis at any time by pressing the **Stop** button.

Once the analysis is complete, the green graph is overlaid withvertical orange lines that indicate where SCRATCH inserts edits based onthe current values for Sensitivity and Size. At this point, you canmodify the Sensitivity and Size values to get the orange linescorresponding to the large spikes found during the analysis.
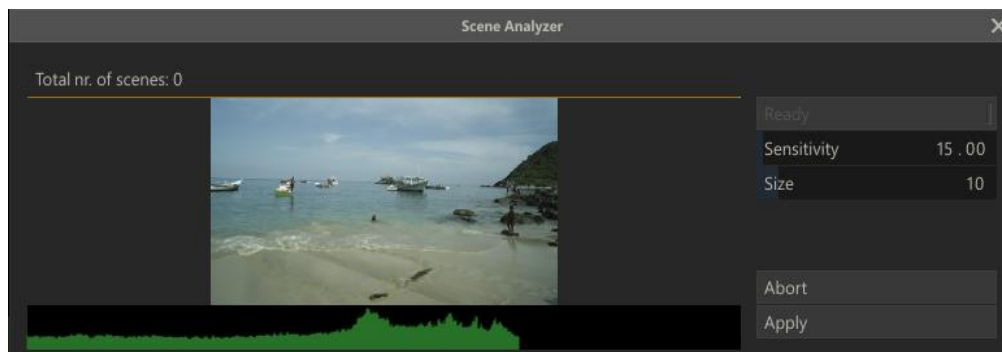
Note: The Analyze function is only available when you entered the Player with the entire CONstruct.

Sensitivity

The Sensitivity parameter determines how large of a difference musthave been detected to insert a new edit. The higher the vertical spikeon the graph, the bigger the difference SCRATCH detected. By increasingthe Sensitivity, SCRATCH will create edits from shorter vertical spikes.Lowering the Sensitivity will create edits only for the larger verticalspikes. If a spike turns orange, an edit will be inserted at that pointin the clip.

Size

The Size parameter determines the minimum number of frames that mustexist between new edit points. The default setting of 10 means thatSCRATCH will not create an edit of less than 10 frames duration when theanalysis is applied.

As you adjust the Sensitivity and Size values, you see the orangeedit indicators updating. Once you get the edit indicators lined up toyour satisfaction, press the **Apply** button to insert the new edits. You can also press the **Abort** button to close the Shot Analyzer window and leave the timeline unchanged.

COLLECTOR

Use the controls in this section to **Create** a Collector node. The collector node was discussed in Chapter 4 - The CONstruct and represents a timline in a node. The Create collector function creates a new Collector node with all currently selected items in the editor. Items of sub-tracks will be added as Scaffolds on top of the selected items in the first track .

The **Replace** option will remove the selected items on the timeline and replace them with the single new Collector node. The **Trim** option will skip any space between selected items. If Trim is off - the collector will preserve the space between selected items.

If the current selected shot on the timeline is a Collector node the **Create** button will turn in an **Expand** button. Expanding a Collector node will remove the collector and create new slots and shots in its place.

FLATTEN

The Flatten section allows you to consolidate tracks. The **Flatten** function depends on the options set.

SLOT

If Slot is enabled the Flatten function will consolidate only the current slot on the main track. For each sub track with media on that section of the timeline, a Scaffold is created on the shot on the main track with the sub-track media as Fill. The media on the sub-track for that section is removed.

TRACK

The full sub-track is consolidated into Scaffolds on the shots on the main track. Using the **All** option will do this for all sub-tracks at once.

05 - Effects

GENERAL
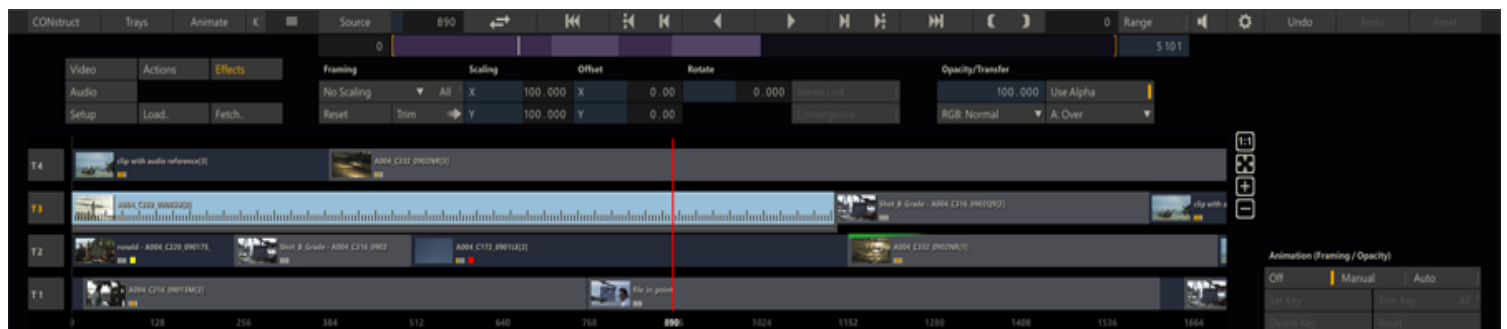
Through the Effects menu panel you can set the Shot Framing and Opacity / Transfer modes. When in the Effects menu - the far right of the Edit panel shows the standard Animation controls. For more information on animations - see chapter 7 - The Matrix.

SHOT FRAMING

Shot framing is processed as part of the timeline and as such, you can only adjust the framing of a shot when you are viewing it in the context of a timeline / CONstruct. Framing is made up of five parameters: **X Scale**, **Y Scale**, **X Offset**, **Y Offset** and **Rotate**. You can set these parameters manually by entering values into the Numerical Slates. These parameters can also be animated using the SCRATCH Animation tools.

FRAMING PULL-DOWN

The Shot Framing pull-down is a quick and easy way to create the most common framing situations.

146

No Scaling

The shot is centered in the frame at a 1-to-1 pixel relationship. If the shot's resolution is smaller than the working resolution of the CONstruct, you will see black around the edges of the frame. If the shot's resolution is larger than the working resolution, the image will extend beyond the border of the frame.

Fit Width

The shot is scaled so that the width of the shot matches the width of the working resolution. Both X and Y axes are scaled equally to maintain the aspect ratio of the original shot.

Fit Height

The shot is scaled so that the height of the shot matches the height of the working resolution. Both X and Y axes are scaled equally to maintain the aspect ratio of the original shot.

Custom

Custom scaling allows you to specify the exact X and Y scaling you require by entering a value into the Numerical Slates.

Note: Any of the framing parameters can be adjusted at any time. If the values are changed, the framing pull-down automatically switches to Custom.

Apply | All

The **Apply** option on the framing pull-down is used in conjunction with the All button, allowing you to apply the current framing values to all shots in the timeline.

To use **Apply** , set the framing on the current shot to the desired settings by using either the framing pull-down, or by manually setting the framing parameters. Activate the **All** button and then select Apply from the framing pull-down. The current framing values are applied to all shots in the current timeline.

Tip: This is a very quick way to bring a group of shots with mixed resolution all to the same viewing size. For example, if you have full-resolution elements that are 2048 x 1556, and mix those with low-resolution offline images that are 512 x 389. you can bring the low-resolution shots up to match the full-resolution shots. This is done by setting the framing controls to Fit Width, and then activating All and selecting Apply. Now all the shots will be the same size within the CONstruct; shots will not pop from one size to the other while playing back.

TRIM

The Trim option allows you to copy the adjustments to the scaling forward to all clips on the Edit after the current one. Only the adjustment (delta) will be applied forward, not the exact framing.

RESET

The Reset option will restore the default framing settings for the shot. The Reset will leave any of the other Source Transform settings untouched. For that you use the Reset button on the main menu bar of the Player.

STEREO OPTIONS

The Link and Convergence options for Stereo media are discussed in more detail in Chapter 7 - The Matrix, the section on Input Transform.

OPACITY AND TRANSFER MODE

Controls to set the opacity level of the shot, toggle whether to use the shot's alpha channel and set the RGB and alpha transfer modes. These settings only apply to shots being used on sub-tracks. For shots on the main timeline track these settings have no meaning and as such the controls are disabled. These controls are also available from the Matrix toolset. The different transfer modes are described in detail in Chapter 8 - Scaffolds.

06 - Audio

GENERAL

There are different modules in SCRATCH for handling audio:

- CONstruct - Media Browser; (auto) link audio with individual shots and set the slip.

- Player - Audio Panel; Manage audio devices, channel mappings and volume. Slip and Auto Peak detection.

- Editor - Audio sub-menu; view audio wave form, link audio with individual shots or with the timeline as a whole and adjust the audio slip.

In SCRATCH audio can either be embedded with the underlying media, be linked to an individual shot, or linked to the timeline as a whole. If a timeline has audio linked to it, any audio linked to an individual shot is ignored for playback. Also, audio linked to a local shot overrides any embedded audio in the underlying media.

Each audio channel has its own waveform display in the Audio sub-menu. Note that you can re-size the menu-panel as discussed earlier in this chapter. The waveform will re-size with the menu-panel.

You can link multiple audio files to a single shot or to the Timeline. In the waveform display - all the channels of all the audio files are shown as separate tracks. You use the audio track selectors to change the selection from one audio file to the next. When selecting a track - the waveform display highlights all the channels that are in the same file as the selected track. The controls in the Audio menu apply to that audio file / those audio channels.

The controls at the top of the audio are split in two sections - Local and Timeline.The middle section is used to for channel selection.

LOCAL / TIMELINE

ADD

Opens a SCRATCH Browser to select an audio file that is subsequently linked to the current shot or the timeline as a whole.

Note: When loading a Broadcast Wave audio file for the *current shot*, SCRATCH will automatically calculate a slip value based on the shot and audio timecode. The audio timecode is based on the audio sample rate. In case of a shot with 23.976 drop-frame frame rate, SCRATCH uses an automatic override; if the audio file indicates a sample rate of 24, 48 or 96 kHz, SCRATCH will automatically use 24024, 48048 or 96096 respectively to compensate for the dropframe. To switch off this default behavior you can enable the SConfig variable AS_SAMPLERATE_OVERRIDE. This sample rate override is purely for calculating the audio timecode and slip - not for playback.

REMOVE

Removes (all the channels of) the current selected audio file.

SLIP

Set a slip value to sync the video and the audio. Rather than setting the value through the numeric control, you can also drag the waveform as a whole to the left / right to adjust the slip. When you click anywhere in the waveform the cursor will change in a Slip cursor.
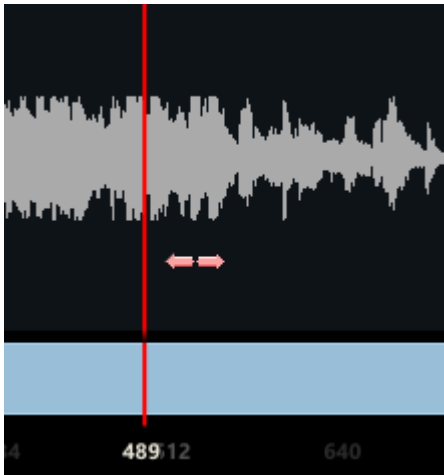
INFO

If an audio file is linked to the current shot or Timeline - the name of the audio file is diplayed below the Local or Timeline buttons. On the far right of the sub-menu information is displayed about the audio device used for playback.

AUDIO CHANNELS

LINK CHANNELS

When enabled all the audio channels of all files that are linked to the current shot or Timeline will slip as one. If this button is not enabled - the slip control only applies to the current selected audio file.

UP / DOWN

Change the audio channel selection. The waveform display and audio track selectors indicate the current selected audio file and channel.

07 - Setup

GENERAL

In the Setup menu you can adjust the appearance of the edit bars in the Editor.

PROXY

Show/hide a proxy image with each slot in the timeline (if scaling allows it).

NOTE

Show/hide presence of annotation with a shot (if scaling allows it).

NAME

Show/hide shot name (if scaling allows it).

GRADE

Show/hide the grading bar-code (if scaling allows it).

SHOW

With this control you can switch the display of various edit controls to show either timecodes or frame counts. Note that you can still switch the display of each control individually by popping up the calculator and switching the display mode from there.

08 - Source Mode and Collector Nodes

GENERAL

In the Setup menu you can adjust the appearance of the edit bars in the Editor.
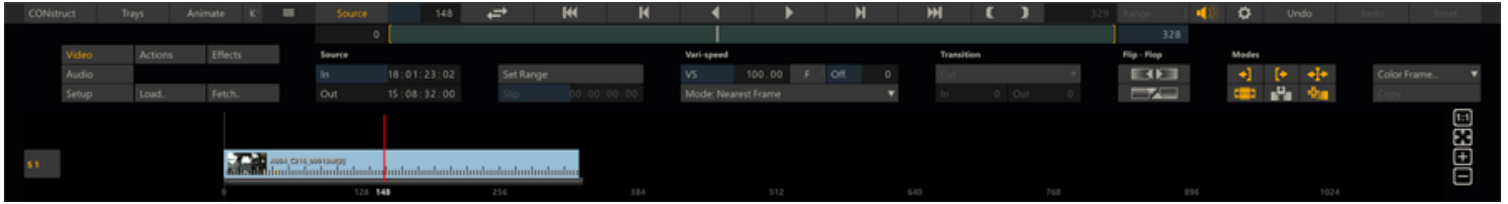
PROXY

Show/hide a proxy image with each slot in the timeline (if scaling allows it).

NOTE

Show/hide presence of annotation with a shot (if scaling allows it).

NAME

Show/hide shot name (if scaling allows it).

GRADE

Show/hide the grading bar-code (if scaling allows it).

07 - The Matrix

01 - Introduction

GENERAL

The Matrix offers toolsets for advanced grading and compositing. Depending on the SCRATCH product the Matrix toolset is presented in a number of sub-menus as depicted below with on the right the toolset as presented in SCRATCH Lab.

Shot	Config	Inputs
Levels	Color	Numeric
Curves	Vectors	LUT
Canvas	Qualifier	Masks
Texture	Fetch..	Insert..
Camera		
Load..	Save..	
Setup		

Shot	Config	Inputs
Levels	Color	Numeric
Load..	Save..	Insert..
Setup		

- Shot - source shot camera specific settings for decoding image or plug-in specific settings. Because this is shot-type specific this menu panel is discussed in Chapter 9 - Process and Plug-ins. Also note that this menu can change in appearance when navigating through a composite shot or when selecting a Layer that has another shot as texture.

- Config - prepare shot for SCRATCH color pipeline: set / remap color space, input transform, framing, etc.

- Inputs - manage the inputs of a composite shot (plug-in). This menu is also discussed in Chapter 9 - Process and Plug-ins.

- Levels, Color, Numeric - manage your primary grade.

- Curves, Vectors, LUT - advanced grading controls

- Canvas, Qualifier, Masks, Texture - control Layers and secondary grades.

- Camera - manage your Layers in a 3 dimensional environment

- Insert, Fetch, Load, Save - access and storing of color settings, shots, LUT, etc.

- Setup - settings to control the behavior of the the various Matrix toolsets

This chapter primarily discusses the color toolset focused on primary color grading. The next chapter covers the Layers toolset for secondary grading and compositing.

THE PRIMARY GRADING INTERFACE

The Primary Grading Interface allows you to make shot-by-shot adjustments to the basic color parameters of your images. These adjustments affect the entire image. Color adjustments are applied in a preset order as follows:

1. Input / source transform

2. Offset adjustments

3. Pre-Gain adjustments

4. Color-A (Hue, Saturation and Lightness) adjustments

5. Gamma

6. Lift

7. Gain

8. Contrast

9. Color-B (Hue, Saturation and Lightness) adjustments

10. S-Curve parametric remapping

There are multiple menus within the Color toolset that allow you to access these adjustments in various ways. They are not separate types of grading. There is always only one color grade applied. The different menus simply present the information

in different formats while certain information can only be accessed from one specific menu. To navigate through the different sections you use the menu buttons at the right of the Matrix menu panel.

02 - Shot and Inputs

SHOT

The **Shot** menu provide access to shot type specific controls:

- certain types of media, like RED r3d or Sony F65, have their own control set for decoding and debayer the images
- effect Plug-ins have their own control set to specify the particular effect.

Note though that some shots - like e.g. dpx media - do not require any additional settings for loading the media. In that case the **Shot** menu is completely empty, except for displaying the shot type and underlying media path.
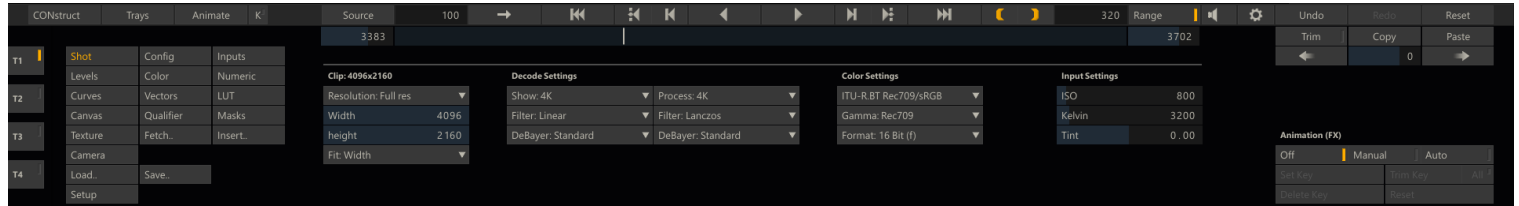
In Chapter 9 - Process and Plug-ins the **Shot** menu control interface for all standard available shot types and plug-ins in SCRATCH are discussed in detail.

INPUT

The **Input** menu is the same for any type of shot and provides you with a thumbnail list of all inputs required for the shot. For clip nodes the **Input** list is empty though as there is no separate input shot - just the underlying media. However, more complex plug-ins may require multiple inputs, such as a separate Background or Matte input. In these cases you can use the **Inputs** menu to load separate shots into each required input.
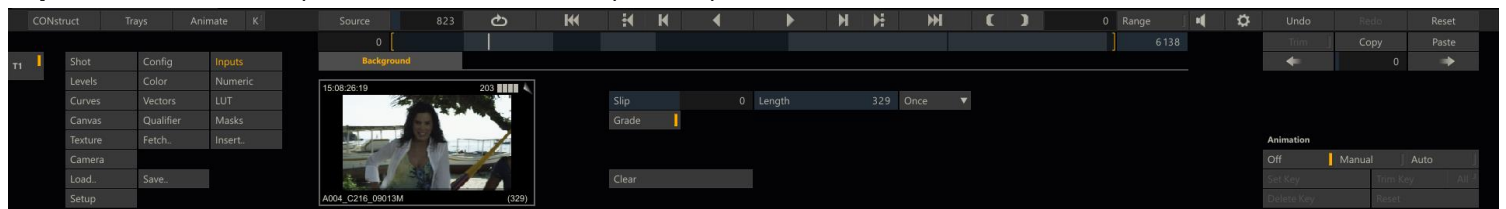
You can use the **FETCH** option in the Matrix (discussed later in this chapter) to select a shot that can serve as input. To remove a shot from an input and revert back to the default, click on the Clear button. Once loaded, you have several controls that can be used to determine how the shot is applied.

SLIP

The Slip control allows you to offset the relationship between the current base frame and the frame being used for the input. You can use the Frame Slip to align the timing of several shots so that all elements are synchronized.

LENGTH

The Length control determines how many frames from the source shot will be used. You can use the Length control in conjunction with Slip and the Loop mode to specify how a shot will behave when applied as an input.

LOOP MODE

The Loop mode controls the behavior of a clip if there are fewer frames than the base shot. There are three options: **Repeat**, **Loop** and **Bounce**.

Repeat

The Repeat mode holds the last frame of the sequence for the remaining duration of the base shot.

Loop

The Loop mode jump back to the first frame of the sequence, and continues looping the entire sequence for the remaining duration of the base shot.

Bounce

The Bounce mode alternates between forward and backward playback of the sequence for the duration of the shot.

For example, if you have a base shot that is 100 frames long, and you load a shot for a Background input, and set that input's length to 25 frames, the Loop mode will determine what frame is used from frames 26 to 100.

If the Loop mode is set to Repeat, frame 25 of the input shot will be held for the remaining 74 frames of the base shot. Loop mode plays the same 25 frames over in the same order. Bounce mode plays the shot forward for the first 25 frames; then reverses for 25 frames; then forwards for 25 frames; and then reverses for 25 frames.

GRADE

Activating the Color Grade button will apply the current color grade to the input shot.

03 - Config

GENERAL

This panel allows you to apply any initial color space adjustments and framing settings to an image before the primary grade is applied.
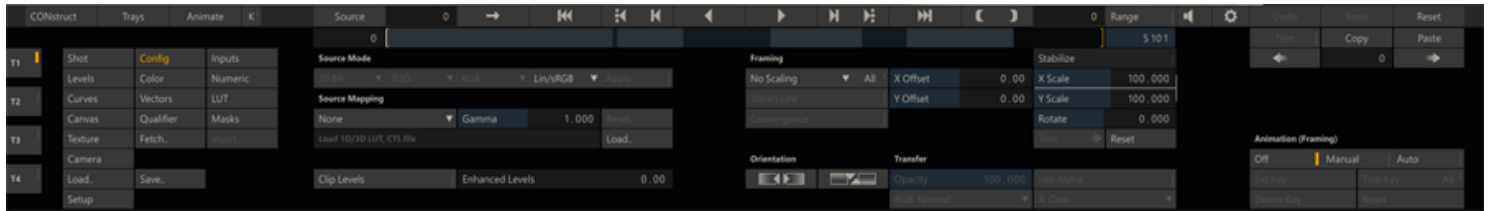
Note: The global Reset button on the main Player menu bar will by default not reset the any Source Transform. Only when keeping the shift key down when clicking the Reset button will the settings in the Source Transform also be reset.

SOURCE MODE AND MAPPING

SOURCE MODE

The Source Mode controls reflect how SCRATCH interprets the media of a shot: color- and file format, color / alpha channels and color space (see Chapter 4 - The Construct, in the paragraph on Output Nodes). For most shots some of the settings are determined by the underlying media and can not be changed. Other settings - like e.g. the colorspace - can be changed and SCRATCH can not always determine the value from the underlying media and meta data. The **Apply** button is available with Output nodes and when set will force a color space transformation if the colorspace of the node's input if differ from itself.

SOURCE MAPPING

The Source Mapping can be used for a Gamma transformation of the underlying media before it is used in the SCRATCH color pipeline: use a standard Linear to Log space or vice verse transformation, set a custom **Gamma** value or **Load** your own custom LUT transformation.

CLIP LEVELS

When enabled - SCRATCH clips color values below 0 and above 1 after applying a Curve or LUT. When this option is off (default) those values will pass through the color pipeline untouched; no extrapolation or whatsoever is performed when applying the LUT / Curve.

ENHANCED LEVELS

This option adds an overall error compensation scheme for all grades. Note that setting this to a high value might - depending on your grade - lead to a too 'obvious' noise pattern.

SHOT FRAMING

The Shot Framing controls are available when you entered the Player with a timeline; framing is only valid and applied in the context of a timeline or nesting node. Shot framing is made up of five parameters: X Scale, Y Scale, X Offset, Y Offset and Rotate. You can set these parameters manually by entering values into the Numerical Slates. These parameters can also be animated using the SCRATCH Animation tools.

• Quick Key: Scroll Mouse-wheel	» Adjust Scaling X and Y
• Quick Key: Click and drag	» Adjust X and Y Offsets

STABILIZE

This button opens the SCRATCH motion Tracker panel. This is described in detail in the next chapter. Stabilizing results in an animation of the framing X/Y Offset values of the shot.

FRAMING PULL-DOWN

The Shot Framing pull-down is a quick and easy way to create the most common framing situations.

No Scaling

The shot is centered in the frame at a 1-to-1 pixel relationship. If the shot's resolution is smaller than the working resolution of the CONstruct, you will see black around the edges of the frame. If the shot's resolution is larger than the working resolution, the image will extend beyond the border of the frame.

Fit Width

The shot is scaled so that the width of the shot matches the width of the working resolution. Both X and Y axes are scaled equally to maintain the aspect ratio of the original shot.

Fit Height

The shot is scaled so that the height of the shot matches the height of the working resolution. Both X and Y axes are scaled equally to maintain the aspect ratio of the original shot.

Custom

Custom scaling allows you to specify the exact X and Y scaling you require by entering a value into the Numerical Slates.

Note: Any of the framing parameters can be adjusted at any time. If the values are changed, the framing pull-down automatically switches to Custom.

Apply | All

The **Apply** option on the framing pull-down is used in conjunction with the **All** button, allowing you to apply the current framing values to all shots in the timeline.

To use **Apply** , set the framing on the current shot to the desired settings by using either the framing pull-down, or by manually setting the framing parameters. Activate the **All** button and then select Apply from the framing pull-down. The current framing values are applied to all shots in the current timeline.

Tip: This is a very quick way to bring a group of shots with mixed resolution all to the same viewing size. For example, if you have full-resolution elements that are 2048 x 1556, and mix those with low-resolution offline images that are 512 x 389. you can bring the low-resolution shots up to match the full-resolution shots. This is done by setting the framing controls to Fit Width, and then activating All and selecting Apply. Now all the shots will be the same size within the CONstruct; shots will not pop from one size to the other while playing back.

TRIM

The Trim option allows you to copy the adjustments to the scaling forward to all clips on the CONstruct after the current one. Only the adjustment (delta) will be applied forward, not the exact framing.

RESET

The Reset option will restore the default framing settings for the shot. The Reset will leave any of the other Source Transform settings untouched. For that you use the Reset button on the main menu bar of the Player.

STEREO OPTIONS

If the current node is a stereo node the Link and Convergence parameters become available. The framing on a stereo node is applied directly to the underlying left and right nodes.

STEREO LINK

Enabling this button will apply any framing control update to both the left and right eye shot. The changes are applied as a delta, meaning that if the initial values for right and left eye differed they will continue to differ.

CONVERGENCE

When the Stereo Link option is enabled, enabling this option will replicate Offset and Rotate changes in opposite direction.

ORIENTATION AND TRANSFER OPTIONS

FLIP / FLOP

Perform a flip or flop on the image before it is processed in the color pipeline. Performing a flip or flop at this stage rather than later in the color pipeline has consequences in that any additional grading layers that might be applied are not aware of the changed orientation and as such will not change orientation when copied from one image to the next.

TRANSFER

Controls to set the opacity level of the shot, toggle whether to use the shot's alpha channel and set the RGB and alpha transfer modes. These settings only apply to shots being used on sub-tracks. For shots on the main timeline track these settings have no meaning and as such the controls are disabled. These controls are also available from the Editor module. The different transfer modes are described in detail in Chapter 8 - Scaffolds.

04 - Levels

GENERAL

The Levels menu reveals two sets of color adjustment sliders - Offset and Pre-Gain - and offers advanced functions for auto-grading and match-grade.

| • Quick Key: 2 | » Quick key for the Levels menu item |

COLOR BALANCE SLIDERS

The Offset and Pre-Gain sliders are used to affect an overall change to the image before any of the Color menu adjustments are applied. In this way, they can be used to adjust and/or neutralize the image's color so that the subsequent color adjustments properly track throughout their range.

For example, if an image is skewed slightly into the green, a Pre-Gain and Offset adjustment can correct the skew. This is done so that Gamma adjustments do not skew the image further into the green as the Gamma is increased.

OFFSET

The Offset controls are similar to the traditional Hazeltine printer light controls from optical color timing. By adjusting the sliders, you can shift the overall image towards a certain color or luminance. The total range of color and luminance remains the same but the values are increased or decreased by the offset amount.

The sliders can be adjusted by clicking and dragging the hash mark indicator within the slider. Use the Quick Key: Shift to alter the responsiveness of the sliders.

| • Quick Key: Shift | » Modifies the sensitivity of the Sliders |

Clicking on the small arrows at the top and bottom of each slider adjusts the slider by a preset amount.

Note: The Offset can be calibrated to match the specifications of a film lab by adjusting the Luma Weight and Print Light settings in the Config/Options menu of the Matrix. This menu is covered in detail later in this chapter.

You can also adjust the sliders using the Numerical Slates at the bottom of each slider. These behave like all other Numerical Slates in SCRATCH.

155
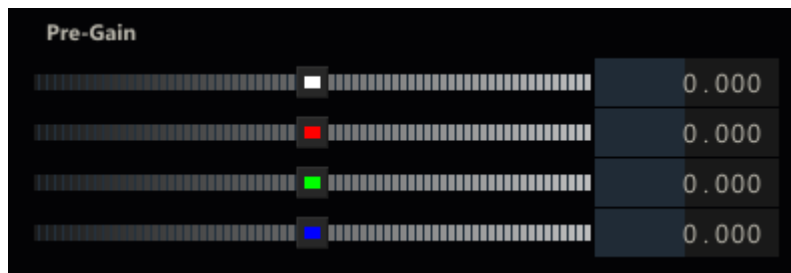
PRE-GAIN

The Pre-Gain adjustments allow you to scale the individual color channels around preset pivot points, which are determined by the black and white level pivot point (described in the PIVOTS section below). Pre-Gain is typically used in conjunction with the Offset adjustments to balance the overall luminance, red, green, and blue levels in an image. This has the effect of neutralizing the color balance of the image in preparation for further manipulation.

SLIDERS

Both the Offset and Pre-Gain settings can be manipulated using Slider controls or - when disabling the Slider option - by using Tracker Ball controls. The Slider on/off option is stored as a user setting.

GRADE TOOLS AND SETTINGS

AUTOGRADING

You can use Autograding to adjust the Offset and Pre-Gain values to automatically fit an image into the selected range determined by the pivot color pots.

Note: If the **Set Master** button is enabled, Autograde sets the Master adjustment as well as the individual RGB channel values.

MATCH GRADING

Match grading can be used to modify the RGB levels on one image to align, or match, with another image based on a Source and Target RGB value that is sampled from each image.

To use the Match Grade function, first select a Source color by clicking on the Source color pot; you then use the Color Picker and/or the Color Selection Palette tool to select a color from the source image that will be used as the RGB reference to be modified.

Next, select the Target color pot and use the Color Selection Palette to choose the destination color.

Pressing the Match Grade button then adjusts the RGB levels from the Source color to align with the Target color.

While working with Match Grade, you can use the Histogram view (discussed in Chapter 05 - The Player) as a guide for visualizing the Source and Target RGB values. After selecting the Source color you will see the Histogram displaying a lower split. This indicates where your Source Levels fall across the Luminance and RGB ranges.
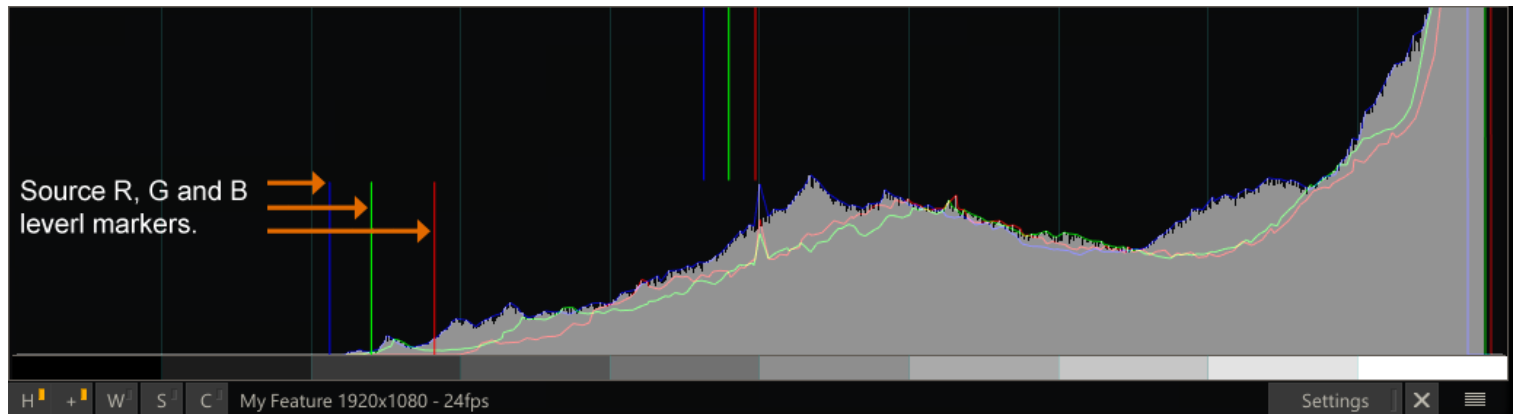
After selecting the Target color, the Histogram displays a second set of markers, indicating the RGB values that represent how the levels will be shifted if a Match Grade is executed.
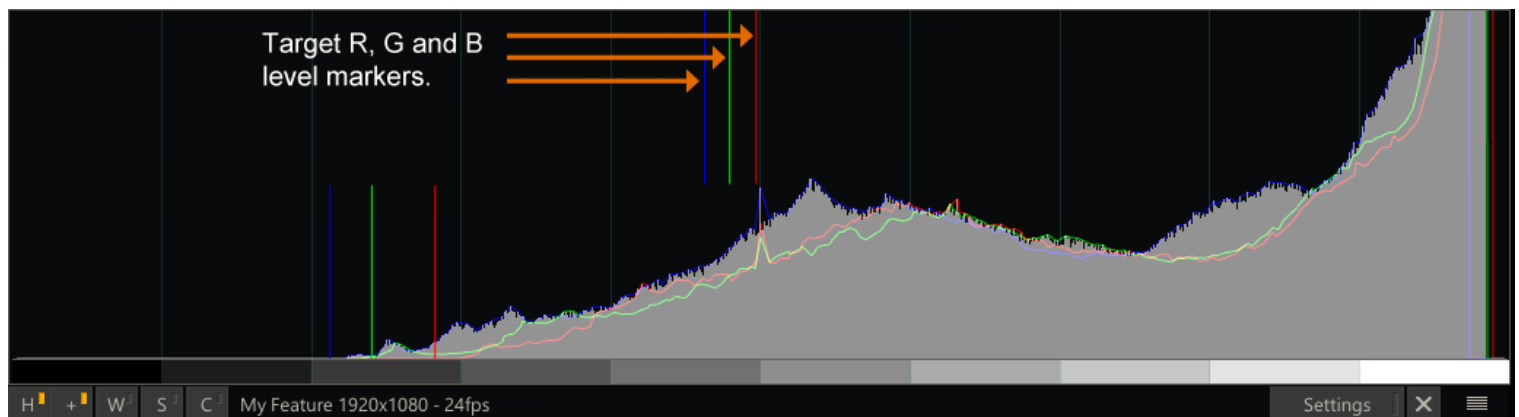
INVERT, RGBA

The **Invert** button inverts the color channels of the image. All color adjustments are done after the inversion.

COLOR- AND ALPHA CHANNEL MIXER

With the color-channel mixer you can alternate the position of red, green, blue and alpha components to handle and process e.g. BGR images instead of regular RGB formatted images. Using the channel=0 option you can exclude a certain channel all together.

05 - Color

THE COLOR MENU

The Color menu consists of five Tracker Balls, one for each of the following color adjustments: Color-A, Lift, Gamma, Gain, and Color-B.

TRACKER BALLS

The order of these Tracker Balls on the menu reflects the ordering of the color adjustments as outlined above with the exception of Gamma, which is placed in the center due to its general relationship with Lift and Gain.

The Tracker Balls can be manipulated either directly or through a Heads-up interface.

DIRECT MANIPULATION

The Lift, Gamma and Gain Tracker Balls have a crosshair indicator at their center. This crosshair indicates the direction and amount of color bias that is being applied for each parameter. You can click and hold on the crosshair and drag it in the direction you'd like to adjust. The display will continuously update as you make adjustments.

The outer ring around the Lift, Gamma and Gain Tracker Balls is the Master offset control for that parameter. You can click on the hash mark indicator and drag the ring clockwise,or counterclockwise, to increase or decrease the Master level.

For Color-A and Color-B, the Tracker Balls represent Hue and Saturation adjustments. Clicking inside the color wheel area allows you to adjust the Hue offset by rotating the colorwheel in the desired direction. The color offset is shown as a separate ring inside the color wheel area.

The outer ring around Color-A and Color-B control the Saturation adjustment for each. You can click on the hash mark indicator and drag the ring clockwise or counterclockwise toincrease or decrease the Saturation.

All direct manipulations can be modified using the Quick Key: Shift to alter their responsiveness.

• Quick Key: Shift   » Modifies the sensitivity of the Tracker Balls

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Note: The settings for the Quick Key: Shift is made in the Control Gearing section of the User Settings menu in theStart-up Screen. See Chapter 3 – THE STARTUP SCREEN for more information about setting the Control Gearing options.

HEADS-UP MANIPULATION

Another method of adjusting the Tracker Balls is to use the Heads-Up mode. Rather than having to click inside each Tracker Ball, you can use several Quick Keys to select a parameter and then make adjustments using the mouse within the View Port.

• Quick Key: J	» Control Color-A
• Quick Key: K	» Control Lift
• Quick Key: L	» Control Gamma
• Quick Key: ;	» Control Gain
• Quick Key: '	» Control Color-B

When the Quick Key is pressed, the corresponding Tracker Ball gets a yellow highlight around it.

With the Quick Key held down, the entire View Port area becomes an active Tracker Ball interface. Clicking anywhere in the View Port, and moving the mouse, is the equivalent of moving the Tracker Ball crosshair in that direction, or rotating the Hue offset in the case of Color-A and Color-B. The mouse wheel controls the associated ring parameter for the selected Tracker Ball.

This allows you to remain focused on the image, while adjusting the grade, rather than having to constantly look down at the menu. The result is a very fast and intuitive methodof color grading.

Tip: These Quick Keys work even if the Main Menu has been minimized by swiping down off the bottom of the screen.

TRACKER BALL RESETS

Below each Tracker Ball is the Reset button. In its normal state, the Reset button resets all the parameters for the associated Tracker Ball. You can use the Quick Key: Shift to reset only the Master or Saturation for a particular Tracker Ball. When the Quick Key is held down, the Reset button's text changes to an **M** on Lift, Gamma and Gain. This indicates a Master reset – and an **S** on Color-A and Color-B, and Saturation reset.

Similarly, you can hold down the Quick Key: Control to reset only the Color portion of the Lift, Gamma and Gain Tracker Balls, or the Hue offset ofColor-A and Color-B Tracker Balls.

• Quick Key: Shift	» Activate Saturation and Master reset controls
• Quick Key: Control	» Activate Hue and Color reset controls

06 - Numeric

GENERAL

The Numeric menu gives you access to the widest range of color adjustments within a single menu. All color parameters from the Levels and Color menu panels are repeated in Numerical Slates in this menu panel with additional control of Color-A and Color-B Lightness. In addition the Numeric menu has controls for Contrast, S-Curve and Defocus adjustments.
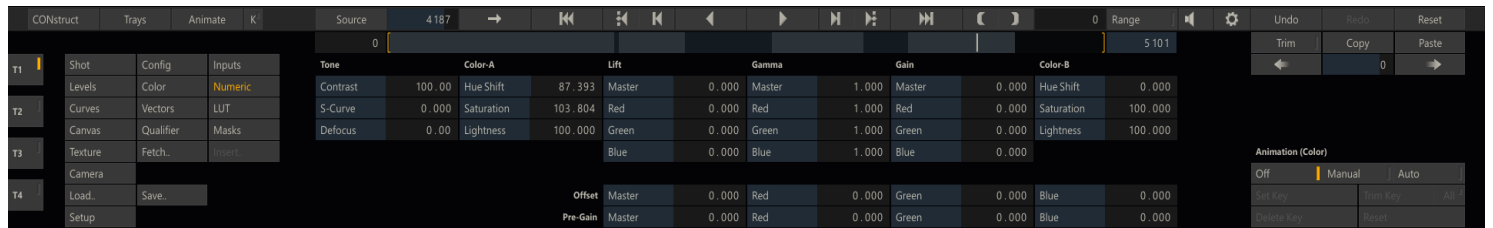
• Quick Key: 6	» Numeric menu shortcut

TONE CONTROLS

CONTRAST

The Contrast adjustment scales the luminance values of an image around the central gray point set in the Levels menu. The effect is an increase or decrease in contrast within the image.

S-CURVE

The S-Curve adjustment modifies the overall contrast of the image but in a much different way than the standard Contrast adjustment. The S-Curve adjustment will preserve the black and white points of the image which using a smooth transition to higher contrast in the midrange of the image. The result is a higher overall level of contrast while still preserving detail in the highlight and shadow regions.

DEFOCUS

Adjusting the Defocus parameter adds a blur to the image. This is generally good for slight de-graining or softening of an image. More extreme defocus effects can be created in the SCAFFOLDS menu.

07 - Curves

GENERAL

The Curves interface allows you to re-map the luminance, hue, saturation or individual color curves of a shot by manipulating a curve that represents input and output ranges.
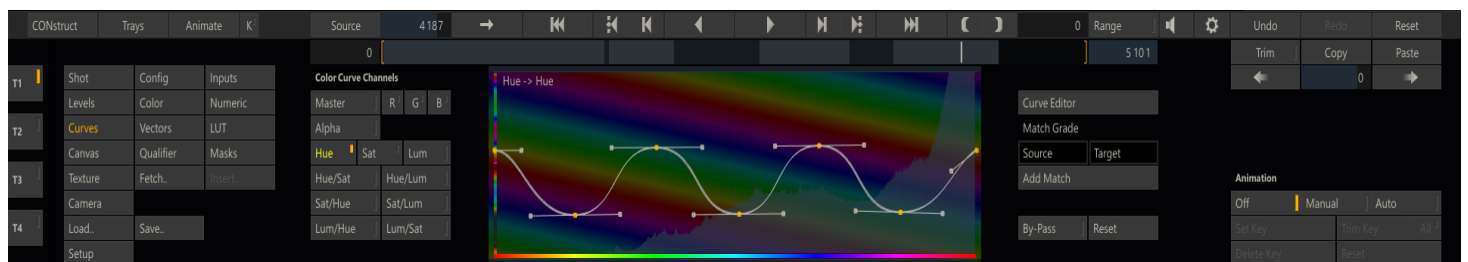
In total there are fourteen curves that can be manipulated and which can be selected using the buttons on the left of the curve display:

- Overall luminance (Master) and red, green and blue channel luminance,

- Alpha, Hue, Saturation and Luminance,

- Hue versus Saturation, Hue versus Luminance

- Saturation versus Hue, Saturation versus Luminance,

- Luminance versus Hue and Luminance versus Saturation

Each curve has a number of control points that can be adjusted within the curve display. There are also Bezier handles on each point that allow you to adjust the shape of the curve through the three control points. The sensitivity of the control points is relatively moderate; you can hold down the Quick key: shift to modify the sensitivity of the control points in order to reshape the curve.

• Quick Key: Shift	» Modifies the sensitivity of repositioning control points of curve

In the background of each of the curve displays, the full histogram of the current shot in the Player is drawn. Rescaling the Histogram on the Statistics panel as explained in Chapter 5 - The Player, will also rescale it in the background of the curve display.

The horizontal axis of the curve display represents the source image range from low to high. The vertical axis represents the resulting range. New values are calculated by projecting up from the horizontal axis at a particular value; and then the intersection point with the curve is projected left to the resulting value. The curve display is, in essence, a visual representation of a Look Up Table that allows you to easily make interactive adjustments.

CURVE TOOLS

CURVE EDITOR

The **Curve Editor** button opens the Animate Curve Editor where the parameters can be adjusted over time and the number of control points can be changed. The Curve Editor is discussed in more detail later in this chapter.

MATCH GRADE

The Match Grade controls allow you to manipulate the RGB channel curves by selecting colors rather than manipulating the curves directly. Using the corresponding color selectors you can pick your Source color and Target color. Next, use the Add Match button to adjust the RGB curves when the source color is remapped to the target color.

BY-PASS

When enabled - SCRATCH ignores all the curve settings.

RESET

Reset only the current selected curve.

08 - Vectors

GENERAL

The Vector interface offers you six possible color selections or vectors that can be isolated and adjusted, allowing you to make quick changes to the overall image within a certain color range.
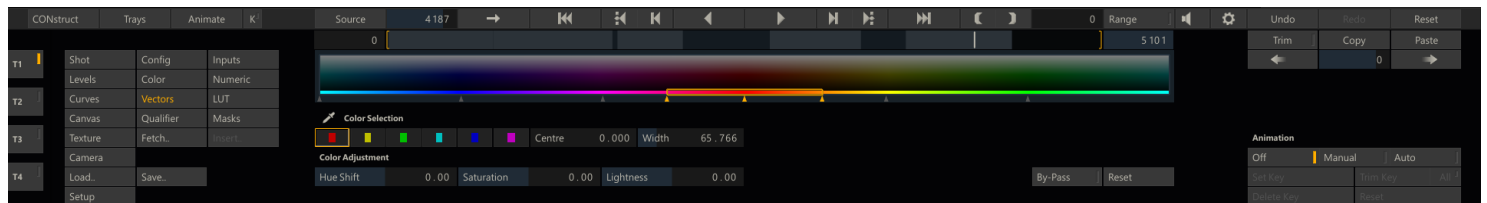
The color isolation is determined by identifying a wedge-shaped portion of the color wheel. By default, the vectors are set to the six primary and secondary colors: red, green, blue, yellow, cyan and magenta. These can be modified at any time to isolate alternate colors.

COLOR SELECTION

To modify a particular vector, click one of the predefined vectors. The current selected vector is highlighted by an orange rectangle. If you click the selected vector again it will act as a color picker and you can adjust the vecotr by selecting a color in the image or by using the color menu.

The selected vector is also displayed in the color ramp at the top of the menu - the center point as well as it width by the two outer arrows. To adjust the vector or resize it you can either use the corresponding controls or by dragging the vector selectors in the main color ramp directly. After setting up your vector you can use the Color adjustment controls to remap it.

CENTRE

The Centre Numerical Slate adjusts the base color position of the vector. This is the root color that is being isolated.

WIDTH

The Width Numerical Slate adjusts the amount of additional color on either side of the base color that is isolated by the vector. This results in a wider range of colors being isolated.

COLOR ADJUSTMENT

HUE SHIFT

You can offset the hue in the isolated color range using this Numerical Slate.

SATURATION

The amount of saturation in the isolated color range can be increased or decreased using this Numerical Slate.

LIGHTNESS

The amount of lightness in the isolated color range can be increased or decreased using this Numerical Slate.

BY-PASS

When enabled, SCRATCH ignores any of the vector adjustments set.

RESET

Reset the current seleted vector to its defaults.

09 - LUT

GENERAL

The LUT interface allows you to load any custom LUT as a primary grade on the image.
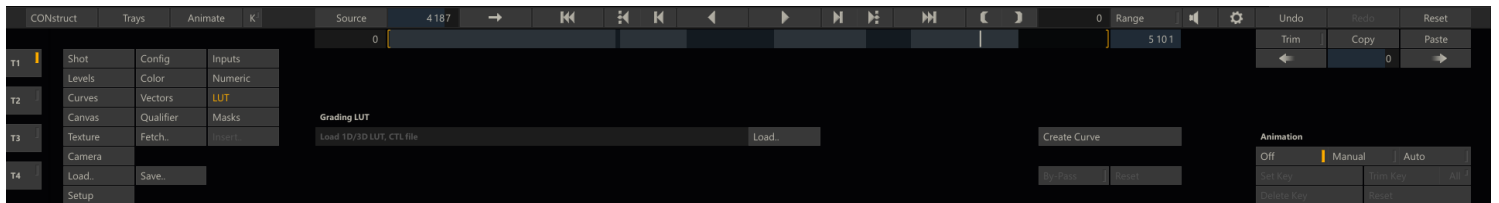
Use the **Load** button to select a LUT. LUTs must be in a format that SCRATCH can read. See the Chapter 10 - Customization for more details on supported LUT formats. The **Create Curve** button will transform the loaded LUT into a curve that can be viewed in the Curves menu - discussed earlier in this chapter. The **By-Pass** button toggles the use of the LUT on and off. The **Reset** button removes the LUT file reference.

10 - Generic Matrix Functions

GENERAL

The Matrix toolset has a number of generic functions available from all sub-menus.

COPY AND PASTE

Once a grade has been created on a shot, you can copy that grade into a clipboard buffer; it can then be pasted onto other shots in the CONstruct.

Note: The copy and paste operations apply to more than just the primary grade. Layers and Shot Framing are also copied into the clipboard so that they can be applied to other shots as well. While this section refers strictly to the primary grade, keep in mind that there is other information that is copied as well. Applying this information is covered in the section on pasting a grade.

COPYING A GRADE

To copy the current grade into the clipboard, click on the **Copy** button on the right side of the Main Menu. This loads the current grade into the clipboard.

• Quick Key: Control + C   » Copy a Color Grade into the clipboard buffer

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PASTING A GRADE

To paste a grade you either use the Paste button or you drag and drop a shot on the current shot in the View Port.

• Quick Key: Control + V   » Paste a Color Grade from the clipboard

When the **Paste** button is selected - a dialog is shown where you can set which aspects of the source shot settings and grade should be pasted on the new shot.
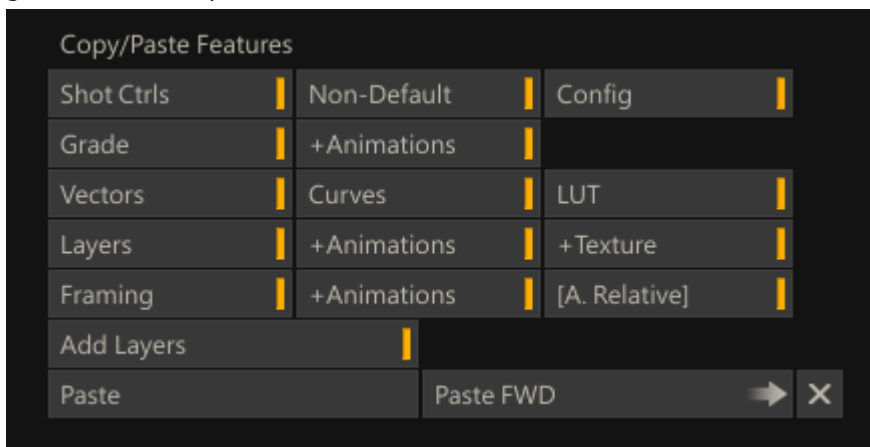
- **Shot Ctrls** - covers the shot specific controls (plug-in / source media decodes / etc.). The **+ Non-Default** option causes SCRATCH to only copy those settings from the source to the target that have a different value than their default.

- **Config** - paste any source mode and remapping set on the source shot.

- **Grade** - covers all of the primary grade set in the Levels, Color and Numeric menus.

- **Vectors**, **Curves** and **LUT** cover the settings from the corresponding menus

- **Layers** - covers all the secondary grading

- **Framing** - covers any framing set in the Config menu / Edit module.

For certain selections you also have the option of pasting any associated animation or textures by toggling the **+Animation** or +Texture button. Enable the **[A. Relative]** button to paste any Animation Channels relative to the in-point of the shot rather than using the absolute position of the shot in the copy buffer.

The **Add Layers** option allows you to preserve any existing Layers on the target shot. Any Layers from the source shot are just added to the target shot.

• Quick Key: ALT + Click feature   » Select the feature and deselect all other
                                           selected feature

The **Paste** button starts the actual paste operation.

The **Paste FWD** button will paste the current clipboard onto every shot from the current shot to the end of the timeline. This is a very fast way of applying the same grade to every shot. You can limit the number of shots processed by setting a Player Range - the Paste will stop at the out-point of the Range.

Note: You can adjust the paste settings in the dialog without actually pasting anything. The Paste button is always available - even if there is no information in the clipboard - by opening the dialog, adjusting the options and pressing the close (**X**) button.

DRAG AND DROP

Rather than using the Copy and Paste buttons or the corresponding short keys - you can also drag and drop any shot onto the current shot in the View Port or click the Paste button while dragging a shot. This functionality is explained in more detail with the Gallery Trays - later in this chapter.

THE TRIM BUFFER

The Trim buffer is a temporary storage area for quickly comparing one version of a grade to another. The Trim buffer works in conjunction with the current grade so that when you modify a grade on a shot, the previous version of the grade is automatically stored into the Trim buffer.

Note: The Trim buffer is only updated automatically the first time you change a grade on a shot. It will not automatically update as long as you remain on the current shot. You can manually update the Trim buffer using the **Update** and **Restore** buttons, discussed below.

The Trim button changes from grayed out to active when there is something saved in the Trim buffer.
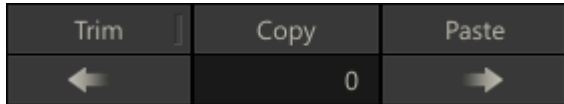
You can display the contents of the Trim buffer by clicking on the Trim button. The View Port will update to show the version of the shot that is in the Trim buffer. The Trim button highlights to indicate that you are viewing the Trim buffer, and not your current grade.

- Quick Key: T   » Open / Close the Trim Buffer

You can continue to modify the current grade and compare it with the Trim buffer. At any time, you can either copy the current grade into the Trim buffer, or you can copy the Trim buffer back into the current grade. When the Trim buffer is being viewed, the Update and Restore buttons are visible to the right of the Trim button.

UPDATE

The Update button copies the current grade into the Trim buffer. The grade that was stored in the dbuffer is overwritten with the new information.

RESTORE

The Restore button copies the grade from the Trim buffer back into the current grade. The current grade issa overwritten with the information from the Trim buffer.
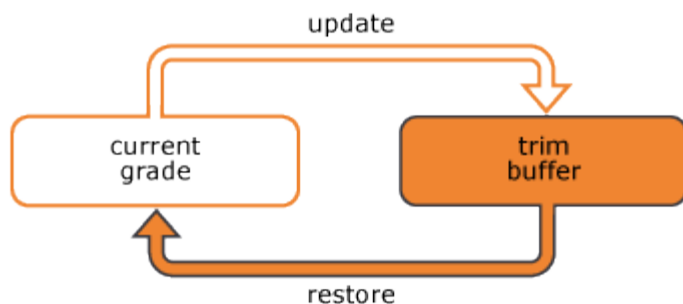
Note: The Trim Buffer is only one layer deep. Each time you update the buffer the previous version is automatically overwritten.

Tip: Because the Trim Buffer is fully independent of the usual Undo/Redo and Reset Commands, it can be used as a temporary backup of a color grade – always restoring you back to the state saved with any Update operation. This includes deleting or resetting any SCAFFOLDS or other parameter. Just keep in mind that the Trim buffer is flushed any time you move to a different shot in the timeline.

OVER MODE

You can use the Over-mode view and Wipe function - Quick Key: S - to compare the contents of the Trim Buffer and your current grade. For more details on using the Wipe function see Chapter 5 - The Player.

• Quick Key: S	» Split Screen between current grade and Trim buffer

AUTO-RESTORE

The Auto-Restore option can be set from the Config/Options menu in the Matrix. This determines how the Trim buffer behaves when color changes are made.

For example, if you are viewing the Trim buffer and Auto-Restore is deactivated, any changes you make to the color adjustments automatically switch the Trim buffer off; this returns the view to the current grade. The adjustments you make are applied to the current grade and the Trim buffer remains as it was.

In the same example, if Auto-Restore is active, and a color adjustment is made while viewing the Trim buffer, then the Trim buffer is automatically restored as the current view; any color adjustments are then made to the newly restored grade. This is the equivalent of pressing the Restore button while viewing the Trim grade, and then making color adjustments.

Note: Auto-Restore is a destructive operation. If any color adjustments are made while viewing the Trim buffer, the current grade will be overwritten by the grade from the Trim buffer without a confirmation. In most cases, this is exactly the desired result. If you make the modification while looking at the Trim buffer, then you are expecting that modification to be made to that image. If Auto-Restore is turned off, then the view reverts back to the current grade and modifications will be made to that image.

PREVIOUS/NEXT COLOR SELECTION

The Previous/Next Color Selection buttons are an extension of the Trim buffer. These controls allow you to load the grade from other shots on the timeline into the Trim buffer of the current shot. When a grade is loaded the Trim buffer is automatically switched on.

You can determine which shot's color grade is being used by clicking on the Previous ![button] or Next ![button] buttons. The Numerical Slate between the buttons indicates from which shot the current grade is being applied. Positive numbers indicate shots to the right of the current shot and negative numbers indicate shots to the left. You can also change the shot number directly by clicking on the Numerical Slate and entering a number.

The Previous/Next buttons use the Trim buffer to hold the color grade from another shot and you can use the **Apply** button to apply the grade you are viewing to the current shot. The Trim buffer is updated with the original grade in the event you would like to revert back.

SAVE, LOAD, FETCH, INSERT

SAVING GRADES

To save the current grade to an external file you use the Save button. This opens a SCRATCH file browser which has the option to save various file formats - each with a different purpose.

- ccr - full primary and secondary grade in a SCRATCH proprietary format.

- .lut - a standard 1D LUT using the Depth and Size parameters specified in the Matrix Configuration Settings.

- .xml - a 1D LUT format used by the S2 digital field recorder. This is useful for applying a look on-set using SCRATCH, and then exporting a LUT back to the S2 recorder, which can be used for on-set monitoring.

- .3dl / .txt - a 3D LUT.

- cdl - a Color Decision List (CDL) as defined by the American Society of Cinematographers. The parameters in the CDL translate to SCRATCH's primary grading: Slope = Pre-gain (In SCRATCH from 0, in CDL from 1), Offset = Offset, Power = Gamma, Saturation = Color B saturation.

When saving a LUT you can include the current monitor LUT by activating the **Include 3D LUT** button in the Matrix Setup menu. The monitor LUT is concatenated with the current color grade to generate a single LUT file.

LOADING EXTERNAL GRADES

Pressing the Load button opens a SCRATCH Browser to load any of the following file formats.

- .ccr - a SCRATCH propriety grade format.

- .cdl / .xml - generic ASC Color Decision List format (as described above). Note that the values in the CDL are normalized values whereas the absolute values as displayed with the SCRATCH controls depend on the source footage.

- .pls - SCRATCH propriety format holding plug-in control presets.

- 1D / 3D Lut formats.

- .ctl - Color Transform Language - as defined by the Academy of Motion Picture Arts and Sciences (A.M.P.A.S.). SCRATCH interprets and executes a CTL script dynamically.

- .svg - Scalable Vector Graphics format: load an image to be used as texture.

When Loading a LUT using the Load button here - the LUT is loaded as a Layer in the current color grade. You can also load a LUT as part of the primary grade, as covered earlier in this chapter in the LUT menu.

FETCH

The Fetch button Replaces the Player View Port with the CONstruct view so you can navigate your construct to pick up a shot that can be used as input or texture for the current shot. While in this CONstrut view you can use the Project Tree to switch between CONstructs. This will not affect your current Player session. Once you picked up one or more shots you can use the Close Construct button on the main toolbar to show the Player View Port again.

INSERT

The Insert button will open the Plug-in Browser which is discussed in Chapter 9 - Process and plug-ins. The Insert button is not always available and depends on the current selected Matrix sub menu. Also - the way a selected plug-in is applied depends on the location from where the Insert was initiated.

- Inserting a plug-in from the **Shot** menu will replace the current shot with the plug-in and use the current shot as input for the new plug-in node.

- Inserting a plug-in from the Texture menu (covered in the next chapter) will create a new Layer with the selected plug-in as Front or Matte Texture.

The Insert option is not available from any of the other Matrix menus.

11 - Trays and Memories

GENERAL

The Tray menu is primarily used when color grading. As mentioned before there are two types of trays: Project Trays - containing references to shots in the current projects and Gallery Trays - containing pure grade settings with no reference to any source media other than a proxy image. You switch between the tow Tray types using the corresponding tabs in the top left side of the Trays menu. Note that you can resize the Trays menu as a whole using the gripper on the Player's main menu bar.

TOOLBAR

Most of the functionality of the Trays is available from the Tray toolbar.

1. PROXY SIZE

Toggle display of proxy images between small and large.

2. WRAP

Toggle display of tray items as one row per gallery versus wrapping items over multiple rows.

3. EDIT

Switch Trays into edit mode which allows you to edit the tray names by clicking the name label, remove a tray by clicking the bin icon or change the name of a tray item by clicking the item and typing in a new name.

4. SORT

Sort the items of the current selected tray according to name or timecode. Only available with Projects Trays. Gallery tray items are stored as individual jpg files in a user folder - outside the project database. As such, they are always sorted by name.

5. PREVIEW

Switch the trays into Preview mode. While in this mode - selecting a tray item causes its grade to be applied to the current shot in the Player. The grade is only applied temporarily. When selecting another item or navigating to another shot in the Player will revert the grade. This allows you to quickly preview a series of grades on the current shot. Note that the grade is applied according to the current Paste settings.

6. ADD

There are multiple Add options - using the drop down arrow next to the Add button. Clicking the Add button itself triggers the default option.

Add Copy (default)

In case of a Project Tray - create a copy of the current shot in the View Port and add it to the tray (use the current Paste settings). In case of a Gallery Tray add a new item including the full grade. Note that you can not add shots to the Project timeline Tray.

Add+

Similar to the Add Copy function but popup the Paste dialog first to set what parts of the grade you want included.

Add Shot Ref

Project Trays only. Add the current shot as a reference shot within the Tray. The entire shot will be added as a live link in the Tray.

Add Frame Ref

Project Trays only. Create a copy of the current shot. This will NOT be a live link and with a Frame Reference no animation data is saved. It is a snapshot of the current values only.

Add Group

Add a new Tray to either the Project- or Gallery Trays. The new tray is automatically selected in Edit mode.

7. APPLY

The **Apply** option has two variants when using the drop down arrow next to it: **Apply** and **Apply+**. The default Apply copies the grade of the current selected Tray item to the current shot in the View Port, using the current Paste settings from the Paste popup. The **Apply+** option explicitly shows the Paste settings popup before applying the grade.

8. DELETE

Remote the current selected tray item: it this is a gallery item this is permanently removed. If this is a Project tray 0reference item, this is only removed from the tray. The shot remains in the project.Note that you can not remove items from the Project Timeline Tray.

9. TRIM

The **Trim** button will apply the current Trim grade (see the section on the Trim buffer discussed in paragraph on Generic Matrix tools) to all shots in the current Tray. This is a quick way of making equal adjustments to all shots in a Tray. Make the necessary adjustment to one of the shots in the tray and then click the Trim Tray Colors button and that adjustment will be applied to all shots in the Tray.

10. COPY

The **Copy** option has two variants when using the drop down arrow next to it: **Copy** and **Copy+**. The default Copy will copy the grade of the current shot in the View Port to all selected tray items, using the current Paste settings from the Paste popup. The **Copy+** option explicitly shows the Paste settings popup before applying the grade.

MANAGING TRAY ITEMS

DRAG DROP

Besides using the Tray toolbar functions to manage Trays and apply grades you can also use drag and drop:

- drag / drop tray items from one tray to the next.

- drag / drop tray items into the View Port to apply a grade: depending on the type of grade and whether a Layer is selected in the View Port, the grade is applied on the primaries or as a new Layer.

- drag / drop tray items to the Proxy timeline to grade Timeline shots. When holding down the Control key when dropping on a Timeline Proxy - the Tray item remains attached to the pen and can be dropped on another item.

- drag / drop items to the Memory floating panel to add memory grades. You can drag / drop multiple items at once to quickly replace your Memory grades.

MULTI-SELECT

When holding down the shift key and dragging the pen over multiple tray items you can extend the selection. Alternatively you can use the Control key and clicking items to extend the selection. Note that when multiple items are selected the **Apply** function will only use the first item in the selection.

SCROLLING AND PANNING

The Tray menu has a single vertical scroll-bar if the number ot trays exceed what fits on the menu. When in non-wrapping mode - each tray in turn will have a horizontal scrollbar if the number of tray items exceed what first in the menu. You can however also pan the Tray menu as a whole by holding down the spacebar and dragging the trays in any direction with your pen.

MEMORIES

Tightly linked to the Gallery Trays are the Memories; a cache to hold up to 8 grades - available at all times from the floating Memories panel and fully controllable from a control surface. The Memory panel is available from the corresponding button in the View Port top toolbar.

ADD GRADES

To add a grade into a memory bank:

- Shift + click the specific memory bank - this will add the grade of the current shot in the View Port.

- Drag drop one or more gallery or shot items onto the memory bank. Note that the Memory does NOT hold shot references / a live link to the shot.

APPLY GRADES

To apply a grade from a memory bank to the current shot in the View Port, simply click it or use the mapping on your surface panel. The grade is applied using the current Paste settings in the Paste dialog.

12 - Animation

GENERAL

The Matrix and Process menus have parameters that can be animated over time. The animation of these parameters is controlled by a block of buttons that are located at the bottom-right side of the Matrix and Process menus.

ANIMATION LOCATION

The text in parenthesis above the animation controls indicates which parameters the animation controls are currently affecting. In the screenshot above the animation controls are affecting the color tools. This allows you to quickly determine what parameters you are animating.

ANIMATION MODES

The animation controls have several modes that are represented by the three buttons at the top: **Off** , **Manual** and **Auto** . The state of these buttons indicates the current mode.

Grayed Out
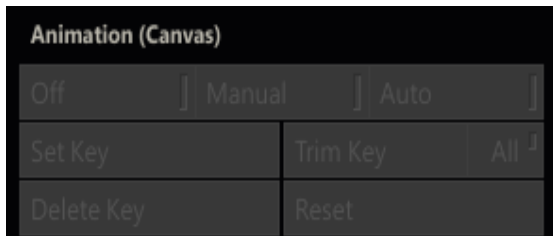
When there are no animatable parameters in the current menu, the animation controls will be grayed out. This can happen with certain Plug-Ins and Effects that do not allow for animatable values.

Off
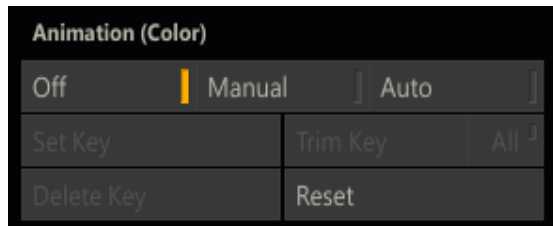
Once there are animatable parameters in the current menu, the animation controls become active but switched off. At this point you can choose how you would like to set keyframes; manually or automatically.

Manual
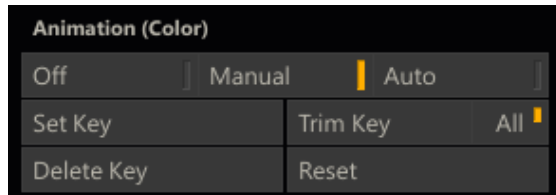
By clicking on the **Manual** button, the remaining controls become active, allowing you to set new keyframes for the animation. The Manual keyframe mode only sets keyframes when the **Set Key** button is pressed. The normal operation is to stop on a frame where you would like to add a keyframe; set the parameters to the values you want and then press the **Set Key** button to create a keyframe (or update an existing keyframe) with the current values.

Auto
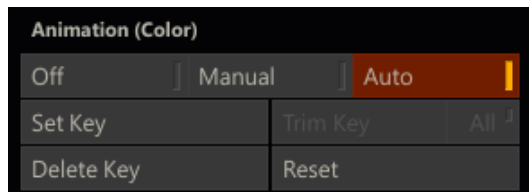
When the Auto mode is engaged, keyframes are automatically set any time a parameter is changed. This can be a very quick way of setting an animation, but it should also be used with care as you can set unwanted keyframes easily.

Set Key

The **Set Key** button is used to manually set the current values as a keyframe at the current frame. Each time the **Set Key** button is pressed, the keyframe values are updated.

Trim Key and All

The **Trim Key** button can be used to offset a keyframe by the amount that a value has been changed. On a single keyframe, this is the equivalent of setting the keyframe to the current value. However, when used with the **All** button you can offset every keyframe in an animation by the same amount with a single click.

Reset

The Reset button removes all animation from the current menu. Individual parameters retain the value they were at when the animation was removed; this is not the same as resetting the parameters.

KEYFRAME INDICATORS

SCRATCH gives you feedback about which parameters have been animated by placing a white bar called a Keyframe Marker on the side of the Numerical Slate.

KEYFRAME SELECT MODE

You can navigate quickly between keyframes by switching the mini-timeline into Keyframe Select Mode. To switch on Keyframe Select Mode, activate the **K** button located to the right of the play controls. The Previous and Next shot buttons are replaced by the Previous ![icon] and Next ![icon] Keyframe buttons.

Clicking on the Previous or Next Keyframe button moves the play cursor to the corresponding keyframe. Keyframes are also indicated in the mini-timeline area as short vertical white lines.

13 - Curve Editor

GENERAL

Animated parameters can also be controlled by a dedicated Curve Editor menu. This menu is opened by clicking on the **Animation** button in the Menu Bar.

Note: When the Curve Editor is open, you cannot jump between shots on the timeline. The timeline will be locked to the current shot. To move to another shot, close the Curve Editor by clicking on the **Animate** button; move to another shot and then re-open the Curve Editor again.

The Curve Editor menu has three sections; the Curve List, the Curve Window and the Curve Controls.

THE CURVE LIST

The Curve List displays all the animatable parameters in a hierarchical list.

The list can be expanded and collapsed by clicking on the small triangles.

On the right edge of each parameter is a number indicating the total number of key frames that exist for that parameter.

Individual curves can be turned on and off by clicking on the parameter name in the list. If a curve is active and being displayed it is be highlighted in the list. You can activate as many curves as you need.

THE CURVE WINDOW

The main workspace of the Curve Editor is the Curve Window. This is where each animated curve is displayed and where you can manipulate the curve to alter the behavior of the animation.

The horizontal axis of the Curve Window represents time going from left to right. A frame count is shown at the bottom to indicate the number of frames from the beginning of the cut.

The vertical axis of the Curve Window represents the value of a key frame.

The red vertical bar represents the currently displayed frame. You can move this bar by placing your cursor over it, clicking

and dragging the frame indicator to a new location. The cursor changes to the Shuttle cursor ![icon] when placed over the red bar to indicate that you can click and drag the frame indicator.

Zoom, Pan and Framing

You can zoom and pan the Curve Window in the same way as the main View Port. There are the standard SCRATCH icons in the Curve Editor which allow you to zoom in, zoom out, set the zoom to default and fit the current curve into the Curve Window.

You can also use the same Quick Keys for controlling zoom and pan within the Curve Window.

• Quick Key: Alt	» Scale the time and value range by clicking and dragging
• Quick Key: Home	» Set the shot length and animation range
• Quick Key: Alt + Home	» Set the shot length and curve height
• Quick Key: Spacebar	» Pan around the curve display

Note: The cursor must be placed over the Curve Window for the Quick Keys to affect the curve view.

THE CURVE CONTROLS

The Curve Controls allow you to modify the behavior of the animation curves, add and remove key frames, alter the shape of the animation curve and define how the curve will behave beyond the first and last key frames.

Copy and Paste

Entire animation curves can be copied and then pasted onto other shots. You can select multiple animation curves, copy those curves using the **Copy** button and then navigate to a different shot and paste the selected curves onto the new shot using the **Paste** button. The pasted curves are matched by their original name so that like parameters are copied onto one another.

Tip: If a single curve is copied it can be pasted onto any parameter regardless of its name.

Global Mode

Rather than dealing with individual key frames and points, animation curves can be controlled on a less granular level using the Global Mode option. When Global Mode is enabled, a gray X- and Y-Bar appear in the Curve Window.
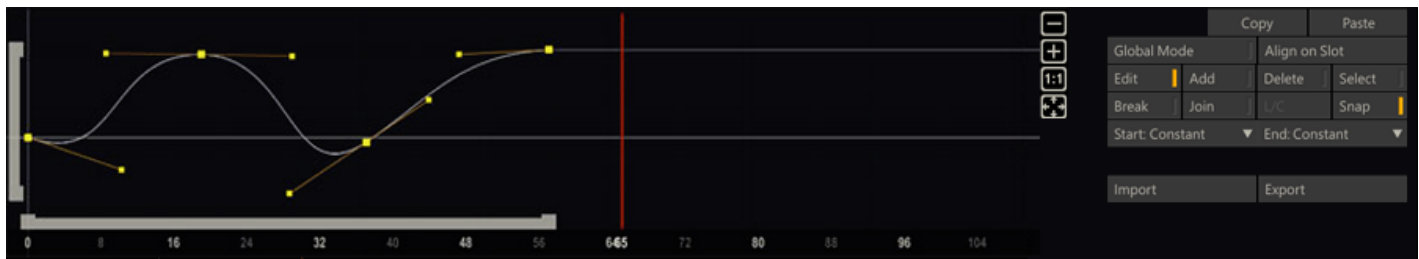
These bars represent the animation curve's start and end points in time (x-bar) and value (y-bar). Clicking on the end points of one of the bars allows you to scale the curve quickly. Clicking in the middle of one of the bars allows you to slide the entire curve left and right or up and down to adjust the overall timing or value of the animation, without having to adjust each individual keyframe.

Aligh on Slot

The align on slot button allows you to shift the curve as a whole to the start of the slot / the in-point of the shot.

172

Edit

The Edit mode allows you to manipulate an individual key frame within the Curve Window. With the Edit mode active, click on any point on the curve and move it to a new location. The Edit mode can also be activated using the Quick Key: E .

• Quick Key: E	» Edit Mode

Add

When the Add mode is active, clicking in the Curve Window adds a new key frame point to the closest active curve. The cursor changes to a green cross to indicate that you are in Add mode. Add mode remains on until it is deactivated; however you can temporarily activate Add mode by holding down the Quick Key: A while in any other mode. Add mode is deactivated when the Quick Key is released.

• Quick Key: A	» Activate Add Mode

Delete

When Delete mode is active, clicking on a key frame point in the curve window deletes that point from the curve. The cursor changes to a bright red crosshair to indicate that you are in Delete mode. Delete mode remains on until it is deactivated by switching to another mode. There is no Quick Key for Delete mode.

Select

Select mode allows you to drag a rectangular selection around multiple points.

All points within the rectangle are selected and can be modified as a group. There is no Quick Key for Select mode.

Note: Multiple points can also be selected by holding down the Quick Key: Control and clicking on each point to be selected. The selected points are highlighted in red.

Break

By default, each keyframe point has two handles which are locked together to maintain a smooth curve through the keyframe. Break mode will allow you to break the two handles apart so that they can be moved independently of one another. This allows you to create instant changes in the slope of an animation curve.

To break the tangency of a keyframe point, select the Break mode, click on the handle you wish to break and move it to a new location. You can also use the Quick Key: B to temporarily activate Break mode.

• Quick Key: B	» Activate Break Mode

Join

The Join mode restores tangency between previously broken handles. This mode functions identically to the Break mode; activate Join mode and then click on a handle to join it with the other handle for that keyframe point. You can use the Quick Key: J to temporarily activate Join mode.

• Quick Key: J	» Activate Join Mode

173

L/C

Keyframe points have two states, Linear or Curved. The default state is Curved but this can be changed using the **L/C** button.

The **L/C** button is not a mode like Break or Join, but instead the button represents the current state of the selected point. To switch the state of a point you must first select the point and then toggle the **L/C** button to the new state. You can also use the Quick Key: I to change the state of any keyframe point.

• Quick Key: I	» Switch Interpolation State

Tip: You can affect the state of multiple points by first selecting multiple points using either the Select mode or the Quick Key: Control , and then clicking on the **L/C** button. The state of each keyframe point will be toggled to the opposite of its current state, so all points do not have to be in the same state to be affected.

Snap

Enable Snap mode to ensure that all keyframe points always snap to the nearest frame in time. With Snap mode disabled, you can place keyframe points between frame boundaries, which can result in unexpected playback results. There is no Quick Key for Snap mode.

Extrapolation Mode

The Start: and End: extrapolation modes control how animation curves behave before the first keyframe and after the last keyframe. Because the first and last keyframes of an animation do not need to fall on the first and last frames of a shot, the settings for these extrapolations can have an affect on the playback results. There are four possible extrapolation modes: Constant, Linear, Loop and Bounce.

Constant

Constant extrapolation means that the value does not change once the end of the animation curve is reached. The value of the first or last keyframe is simply held to the extents of the shot.

Linear

Linear extrapolation means the curve maintains a constant slope outside of the animation curve, based on the slope of the first or last keyframe. This slope can be adjusted by changing the handle of the first or last keyframe.

174
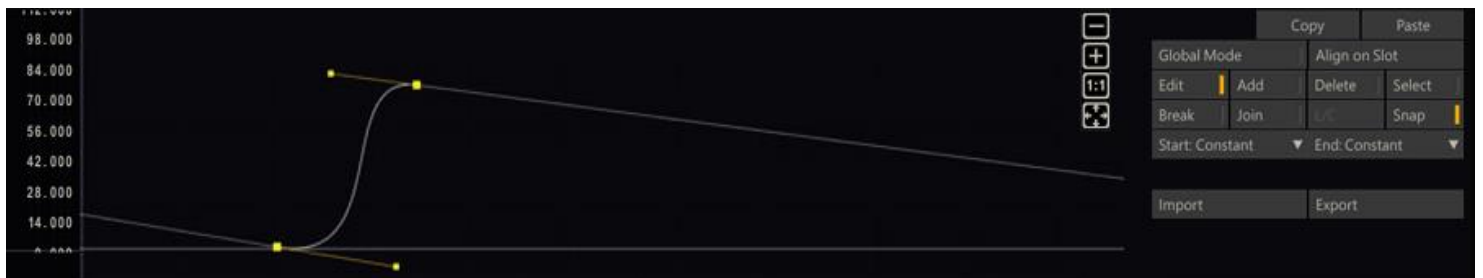
Loop

Loop extrapolation duplicates the animation curve over and over. This is useful for creating repeating animation cycles.

Bounce

Bounce extrapolation is similar to Loop extrapolation, except the curve is not simply duplicated, but is mirrored to create a back-and-forth or bouncing animation.
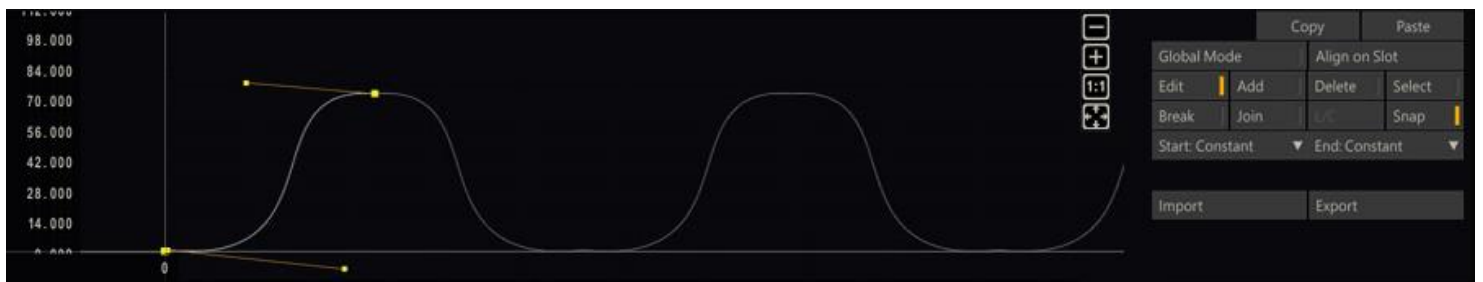
IMPORT AND EXPORT ANIMATION DATA

The Import and Export buttons to the right of the Animation Curve allow you to save and load the numerical animation data. Both buttons will open a file-browser to select a csv-file to open or save. The Export function will save all the selected animated parameters in one single file, using the following format:

#ANIM Guide - Animated Clip\Scaffolds\Scaffold-1\Canvas Transform\Translate X
#COND CC
0.000000,4.708221
15.000000,265.001923
32.000000,23.505127
37.000000,301.063446
#ANIM Guide - Animated Clip\Scaffolds\Scaffold-1\Canvas Transform\Translate Y
#COND CC
0.000000,34.646027,0.000000,34.646027,1.194658,20.373570
7.000000,-48.982285,5.641623,-34.724478,8.031146,-59.805401
14.000000,-112.300873,9.006984,-102.643082,16.090283,-116.344024
28.000000,-89.601746,26.882338,-94.013909,30.878655,-78.237760
37.000000,-21.504410,35.196157,-33.087716,39.292985,-6.780101
52.000000,64.513290,49.021611,49.912187,53.973958,74.190326
66.000000,120.663742,63.610685,111.080804,66.000000,120.663742

....

Each animated parameter has its own section starting with two comment lines which in turn start with a '#' character. The first line of a section-header starts with '#ANIM' and is followed by a reference path to the parameter being animated; clip name\scaffold name\section\parameter name. This is just for informational purposes. On importing an animation file this line will be ignored. The second line in the section-header contains the start- and end - Extrapolation Modes of the animation as discussed earlier in this chapter. This 2-character code uses an abbreviation of any of the existing Extrapolation Modes: Constant (C), Linear (L), Loop (P), Bounce (B). '*CC*' represents both the start and the end of the animation are Constant.

The data-block following the header lines is a comma separated list. The number of columns depends on whether the animation is Linear or Curved. The difference between these modes was explained earlier in this paragraph. If the animation is Linear then there are just two columns; the first representing the frame position and the second the actual parameter

175

value at that position. If the animation is Curved then the six values represent the three control points determining the position and shape of the curve in that position.

On Importing an animation CSV file, SCRATCH will simply check which parameters are selected in the hierarchical list of parameters on the left of the curve. The first parameter selected will be linked to the first section in the animation file, the second parameter to the second section and so on. As mentioned: the first header line in a section with a reference to a parameter is ignored, so you can import data from different clips and types of parameters. If the number of parameters selected differ from the number of sections in the file, SCRATCH will just stop after the last match.

RESIZING THE CURVE EDITOR MENU
The Curve Editor menu can be resized by clicking on the gripper in the Menu Bar and sliding the cursor up and down on the screen. Once you have the desired size, click again to release the gripper.

CURVE EDITOR SHORTCUT
There is a quick way to view the animation curve of a particular parameter.
Start by positioning the cursor over the **Animate** button and clicking down. Do not release the mouse button yet.

Continue to hold down the mouse button and drag away from the **Animate** button. The cursor changes to the **Yellow animate** cursor.
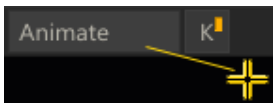
Drag the **Yellow animate** cursor over a menu item for that has had keyframes set. The Yellow cursor changes to **green**, indicating it has detected the presence of keyframes.

Tip: You can quickly tell how many keyframes a menu item has by reading the **K** value, now written over the **Animate** button.

Once the green **Animate** cursor is active, release the mouse button and the Curve Editor will automatically open with the selected parameter already highlighted and ready for editing.

14 - Setup

GENERAL

The Matrix Setup allow you to control several aspects of the Matrix's behavior.
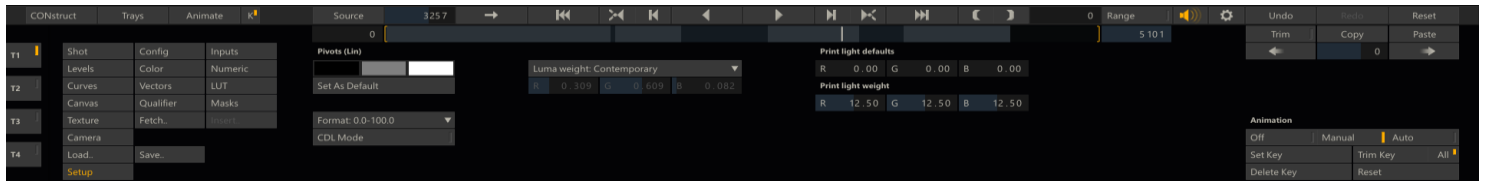
MATRIX SETTINGS

PIVOTS

The three color pots control the pivot points for black, mid, and white point adjustments. The pivot points also determine the reference points used for Autograding (discussed earlier in this chapter). The left color pot controls the pivot point for Gain adjustments, while the right color pot controls the pivot point for Lift adjustment. The middle color pot controls the center point for Contrast and S-Curve adjustments.

To adjust any of the pivot points, click on the corresponding color pot to open the Color Selection Palette and choose a color.

The **Set As Default** button sets the current values of the pivot points as the default values for any new color grading in the current CONstruct. Default pivots are maintained separately for LIN and LOG color spaces.

Note: Once color grading has been applied, changing the pivot point values will affect the existing grade.

COLOR FORMAT

The Color Format pull-down allows you to change how numerical values are represented within the Matrix menus. This does not alter the actual bit depth of the images but simply what number scale is used within the interface.

- 8-bit values range from 0 to 255

- 10-bit values range from 0 to 1023

- 16-bit values range from 0 to 65535

- 0.0-100.0 values range from 0.0 to 100.0

Color Timing values present Colormetric values for lab printer lights. This option can be used in conjunction with Print Light Defaults to set the default values for the Offset adjustments.

CDL MODE

This option allows you to limit the functionality of the Matrix to CDL (Color Decision List) supported primary grade tools: Slope = Pre-gain, Offset = Offset, Power = Gamma, Saturation = Color B saturation. When CDL Mode is enabled only the Color menu is available o make sure you do not work outside the scope of those parameters.

LUMA WEIGHT

The Luma Weights are used to control the color balance, which makes up the overall luminance, so that Hue adjustments maintain a constant luminance value.

Contemporary

The Contemporary setting is the default and most common setting for Luma Weights.

PAL

The PAL Luma Weight was traditionally used for analog PAL video. It is preserved here strictly for reference purposes.

NTSC

The NTSC Luma Weight was traditionally used for analog NTSC video. It is preserved here strictly for reference purposes.

Custom

Selecting Custom as the Luma Weight allows you to adjust each color channel separately. You can use the Numerical Slates to enter a value for each color channel's weight.

Note: These functions should be used with care as they can dramatically affect how color adjustments are calculated.

PRINT LIGHT DEFAULTS

The Print Light Defaults are used in conjunction with the Color Timing format to set the default Offset values for a color grade. Each color channel's default can be set independently by entering a value into the Numerical Slate.

PRINT LIGHT WEIGHTS

Print Light Weights allow you to set the value range for SCRATCH's Offset adjustments so that the SCRATCH interface is synchronized with your film lab.

Each film stop consists of 90 Cineon increments. Film labs divide each stop into a set number as well except not all film labs use the same number of divisions within a film stop.

For example, some film labs work on an 8-point scale. This means that in their system there are 8 increments for each film stop. This would translate to 11.25 Cineon values per film stop in an 8-point scale.

$90/8 = 11.25$

But, in film timing larger values indicate more density being added. So, the Print Light Weights in SCRATCH would be set to -11.25 for each color channel. This gives the Print Lights the proper behavior a film timer would expect.

You should coordinate with your film lab to ensure that the Print Light Defaults and Print Light Weights are set correctly at the beginning of a project. This guarantees accuracy between the SCRATCH grade and the film out.

08 - Layers

01 - Introduction

GENERAL 🔲

The Layers toolset brings additional functionality to the Matrix. You can create unlimited layers on top of the source shot and its primary grade. Each layer can have its own color grade, shape, softness, color qualifier, animation, fill, matte, and tracking. Layers are created and maintained from the Layer Hierarchy List. You can open the List through the top View Port Control Bar of the Player. Swipe the cursor to the top of the screen to show the View Port Control Bar and click the Layers menu item.

By default the Layers list is a floating panel which you can move over the screen by clicking at the gripper in the lower right of the panel. The floating Layers panel shows and hides with the View Port Control Bar, toggling with a top-swipe action. You can also close the Layers list by clicking the button with the **Cross** left of the Gripper.
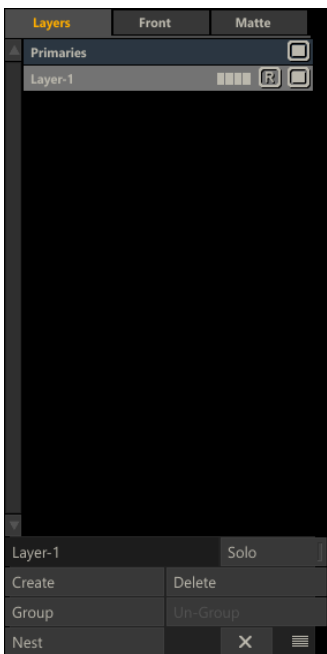
DOCKING

When dragging the Layers panel to the left side of the screen, the panel will at a certain point automatically *dock* to the left side and resize to cover the full height of the View Port. When docked, the Layers panel will behave similar as Version- and Layer Stack on the right side of View Port - hiding and showing on a left-swipe action.
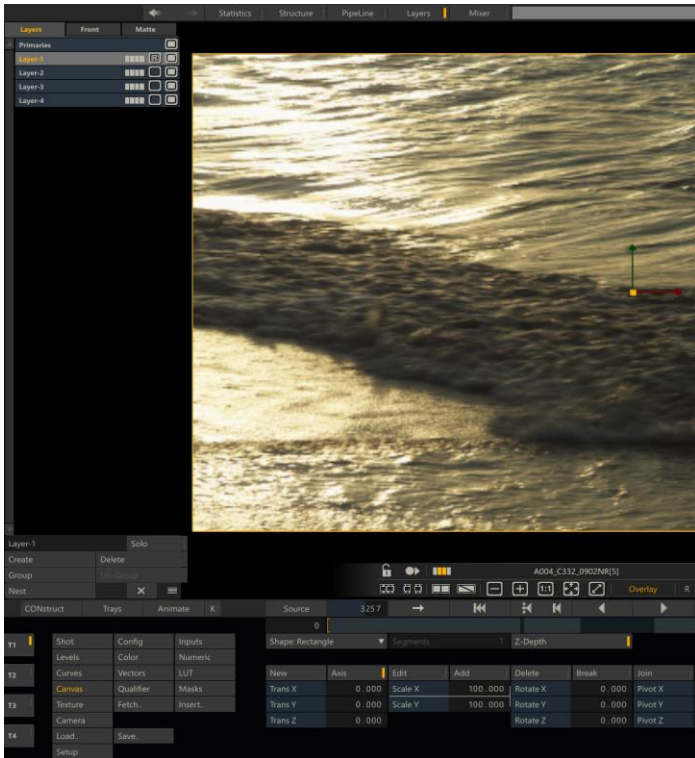
Note: Beware that when the Layers panel is docked it can be hidden while the Layers button in the Control Bar of the View Port is enabled. To unhide the panel you then either swipe left of click the Layers button twice.

02 - Managing Layers

GENERAL

At the top of the Layer List there are three tabs: Layers, Front and Matte. The Front and Matte tabs apply to Layers that contain a texture and are discussed in more detail in the Texture menu in this chapter. by default the first tab - Layers is active. At the bottom of the Layer List there are various controls to manage Layers.
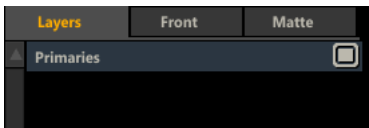
CREATE A LAYER

The **Create** button adds a new Layer. The first time SCRATCH creates two entries in the Layer List: **Primary** and **Layer-1** . The Primary layer is the basic, primary grade for the current shot. The Primary grade is only visible in the Layers list, when there are other Layers. When there is only the primary grade, there is no need for it to be shown. 'Layer-1' is the default name created for the Layer.

Each new Layer is displayed on a separate line in the Layer List. The order of the Layers in the list determines the order in which they are applied. The Primary grade is at the top of the list, so it is applied first. Then each Layer is applied in turn down the list. You can modify this list, disable individual Layers, copy, and remove Layers, all from within the Layers Hierarchy List.

RENAME A LAYER

As the number of Layers on a shot increases, proper naming helps identify each Layer, and allows you to work more efficiently. To rename a Layer, select the Text Slate under the the Hierarchy List; type a new name; and press Enter.

CHANGING THE ORDER OF LAYERS

To move a Layer to a new location in the list, click on the Layer in the list to select it. Once the Layer is selected, click again and the Layer becomes attached to the cursor. You can now place the cursor over the new location in the list where you would like to drop the Layer. The new position is indicated by a horizontal white line. When you click down, the Layer is placed in position within the list as indicated by the line.

ACTIVATE AND DEACTIVATE A LAYER

Layers automatically become active once a Canvas is created or a Qualifier adjustment is made. An status of a Layer is indicated by the right most button in the Layer line in the List: when filled the Layer is active when empty the Layer is in-active.

You can toggle the active state by clicking this button. An inactive Layer is not processed as part of the color grade though all of its information will remain.

Tip: You can deactivate all Layers for the entire CONstruct by turning off the **View Layers** button in the Player Settings menu. Primary grades will still be visible, but all Layers will not be processed. The Layers will still be present, but are simply switched off at a global level.

SOLO MODE

The Solo mode allows you to isolate the viewing of a Layer. The Active state is a setting for the Layer that is stored in the project database - the Solo mode is a temporary setting for the Project Session and used for review purposes. The Solo settings is disregarded when rendering the shot.

The **Solo** button at the bottom of the Layer List enabled the Solo mode: SCRATCH will only display the selected Layers in the View Port. While in Solo mode you can select through the Layers in the List to view each separately.

When viewing the Front or Matte tab of the Layer List - each Layer has its own Solo button - the second button on the right. When in either of these tabs while the Solo mode is active - selecting a Layer will not automatically view it. From here you explicitly add / remove Layers from the view selection by clicking the Layer Solo button and toggling the **'S'** on / off. that wy you can quickly expand your selection.

LAYER BARCODE

Similar to the display of a thumbnails of a shot, a Layer is also shown with a Barcode. The bars represent the absence or presence on a Layer of:

- a primary grade

- a secondary grade

- a shape / canvas

- a qualifier, fill or mate

GROUPING LAYERS

You can select multiple Layers by holding the Ctrl key down. You can then Group these Layers together with the **Group** button. A group can be switched on- and off as a whole as well as moving its position within the complete list of Layers. You can also update the name of a group, making a large amount of Layers more manageable. A group can be un-linked by selecting the group and clicking the **Un-Group** button.

NEST

The Nest function moves all selected Layers onto a new Nest node and sets that node as the fill of a new Layer on the current node. If no particular Layer is selected the current node is replaced with a new Nest node with the current node as its input.

DELETE A LAYER

To remove a Layer - select it from the list and press the **Delete** button. Alternatively you can pick up the Layer and drop it on the **Delete** button.

COPY A LAYER

You can create a copy of a Layer for use within the same shot or on another shot. The copy retains all settings and animations from the original Layer. When you copy a Layer to a new shot and the Layer is using another shot as front or matte texture (see for details later in this chapter) - SCRATCH will automatically rewire the inputs of the Layer and Plug-in used. This means that when you e.g. use a plug-in as front on a Layer which in turn take the base shot as its input, SCRATCH will place that same setup on the new shot and use that as the input for the plug-in. The Paste Forward function, discussed in the previous chapter, exhibits this same behavior

If you select and pick up a Layer from the list and drop it elsewhere in the list it is simply moved. To copy a Layer, select it while holding down the Quick Key: Alt. Note though that when you drop it on another shot is is <u>always</u> a copy whether you held the Alt key or not.

RESET A LAYER

Resetting a Layer returns the color grade values to their defaults. This does not remove any Canvas shapes, Texture adjustments or animations; it simply resets the color grade values.

To reset a Layer you must select it from the List and press the **Reset** button on the right side of the Player Menu Bar.

Note: If **Primaries** is selected in the List, and **Reset** is pressed, all Layers will be deleted and the primary grade is reset. This is a quick way of removing all grading from a shot.

LAYERS GRADING AND TEXTURE

Although the Layer List is maintained in the floating Panel, most of the grading and compositing of individual Layers are controlled through the following menus in the main Matrix menu; **Canvas** , **Qualifier** ,**Mast**, **Texture** and **Camera**. The first four menus represent the individual parts that make up each Layer and determine what portion of the image will be affected by the Layer. The **Camera** menu controls how the Layers are manipulated.
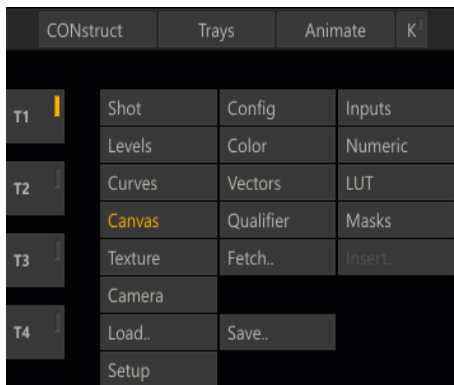
Note: The functions in these menus will apply to the selected Layer. When no Layer is selected or present, all controls in these menus are disabled.

03 - Canvas

CREATING THE CANVAS

The Canvas is the surface on which a Layer operates. You can use the Canvas to affect the entire image or designate a portion of the image to be affected.
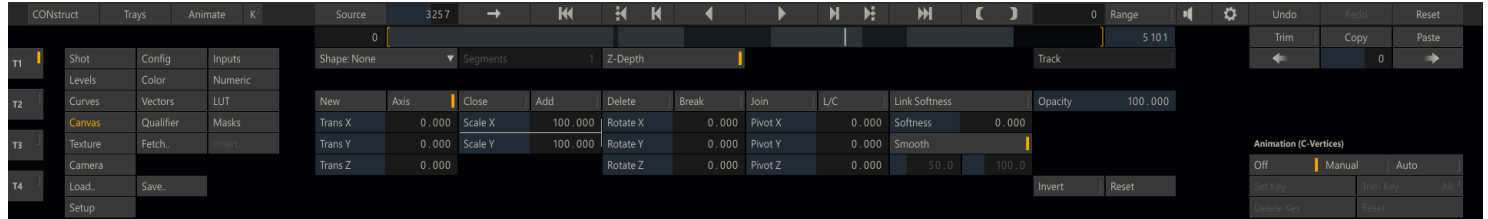
By default a Layer has a rectangular shape that matches the resolution of the current image. There are two ways to designate the shape of the Canvas: through the **Shape** pull-down menu just below the player controls or by using the **New** button.

SHAPE PULL-DOWN

The **Shape** pull-down has five options: Default, Free-form, Rectangle, Circle and Bicubic.
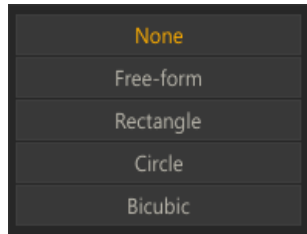
Default

The **Default** option reverts the shape back to its default rectangular shape.

Free-Form

The **Free-form** option switches to the Free-form shape creation mode. The SCRATCH cursor switches to a green crosshair when placed over the View Port. In this mode, you can click in the View Port to create control points that define the shape of the Canvas. Each time you click, a new control point is created. To close the shape, click on the first control point again, or click on the Close button in the menu.

Note: The control points can be edited once the shape has been completed. You cannot edit the control points while the shape is being created.

Tip: Once a Canvas shape has been created, SCRATCH interprets it to be a Free-form shape, regardless of how it was initially made. This allows you to use the same editing tools on any Canvas shape.

Rectangle

The **Rectangle** option automatically creates a rectangular canvas that matches the resolution of the current image.

Circle

The **Circle** option automatically creates a circular canvas with a diameter that matches the horizontal or vertical resolution of the current image, whichever is smaller.

Bicubic

The **Bicubic** option automatically creates a rectangular canvas that matches the resolution of the current image. This option differs from the other rectangular option in that the Layer get options for doing a deformation rather than just rescaling and resizing. Later in this chapter the Bicubic option and deformations are discussed in more detail.

SEGMENTS

Set the number of segments for a **Bicubic** shape. Bicubic shapes and deformations are explained in more detail later in this chapter.

Z-DEPTH

The Z-Depth button determines whether the selected Layer is layered using its position within the 3D Camera's Z space or by its order in the Layer List. With Z-Depth deactivated, the Layer's order within the Layer List determines the layering

priority. With Z-Depth activated, the Layer's Z position is evaluated with all other Z-Depth-activated Layers to determine layering priority and intersections. Z-Depth can be set for each individual Layer independently.

Note: The Camera Depth must be enabled in the Camera menu in order for Z-Depth to be evaluated.

WIREFRAME

Switch used to display a wire frame overlay when using a **Bicubic** shape. Bicubic shapes and deformations are explained in more detail later in this chapter.

EDITING THE CANVAS

NEW

The **New** button removes any current canvas and switches to Free Form creation mode.

AXIS

When the Axis mode is active, the selected Canvas is surrounded by a bounding box, and a central axis indicator appears within this bounding box. These on-screen manipulators can be used to control the scale, rotation, and position of the Canvas. See the section on TRANSFORMATIONS later in this chapter for details about how to manipulate the Canvas.

You can use the Quick Key: E to toggle between Axis and Edit mode.

• Quick Key: E　　　　　　　　　　　　　　　» Toggle Edit and Axis Mode

EDIT

Activating the Edit mode allows you to adjust each individual control point on a Canvas shape. Each control point has a main point and two handles; these can be used to adjust the curves behavior through the main point. You can click on any of these points and move them.

Note: If a Canvas shape has a Softness value, the control points for the Softness appear in the Edit mode as well. These points can be manipulated independently from the main shape control points. See the section about SOFTNESS later in this chapter for more details.

Tip: When the Edit mode is active, you can temporarily switch to other mode, such as Add, Break, and Join by pressing the mode's corresponding Quick Key. When you release the Quick Key you are returned to the Edit mode.

Note: When a Free-form shape is being created, the Edit button is replaced by the Close button.

ADD

When the Add mode is active, clicking on the Canvas shape curve creates a new control point for the shape. The SCRATCH cursor changes to a green crosshair to indicate you are in Add mode. Each time you click while in Add mode, you add a new point until the mode is deactivated.

You can use the Quick Key: A to activate the Add mode; keep key pressed to maintain mode.

• Quick Key: A　　　　　　　　　　　　　　　» Add Mode

Tip: When you first click to add a new point and hold down the mouse button, you can manipulate the point without switching to Edit mode. Once the mouse button is released, clicking again adds a new point.

DELETE

When the Delete mode is active, clicking on a Canvas shape control point, or a control point's handle, deletes the control point from the shape. The SCRATCH cursor changes to a bright red crosshair to indicate you are in Delete mode. Each time you click on a point while in Delete mode, the control point and handles are deleted.

You can also place the cursor over a segment of the Canvas shape curve between two control points. This deletes the control points associated with a curve segment, rather than deleting individual points.

There is no Quick Key for Delete mode.

BREAK

When the Break mode is active, clicking on a control point or its handle breaks the tangency and allows each handle to move independently from one another. This allows you to create sharp angles in the Canvas shape.

To break the tangency of a control point, click once on either the control point or a handle. The curve does not change, but the next time the handle is moved, it will be independent of the other handle. You can manipulate control points and handles while in Break mode, without returning to Edit mode. However, each control point or handle you click, will have its tangency broken. Once a control point's tangency is broken, it remains that way, unless it is restored using the Join mode.

You can use the Quick Key: B to activate the Break mode; keep key pressed to maintain mode.

• Quick Key: B	» Break Mode

JOIN

The Join mode allows you to restore tangency to control points that have had their tangency broken, when using the Break mode.

To join the tangency of a control point, click on either the control point or one of the handles. The curve adjusts so that it connects smoothly between the adjacent control points.

While in the Join mode, you can manipulate control points and handles without returning to Edit mode. However, each control point or handle you click will have its tangency joined.

You can use the Quick Key: J to activate the Join mode; keep key pressed to maintain mode.

• Quick Key: J	» Join Mode

INTERPOLATION

The Interpolation state, represented by the **L/C** button, allows you to toggle each control point between two states, Linear and Curved. By default, each control point is created as a curved point, meaning that it has handles to control how the Canvas shape curve passes through the control point. Switching a control point to Linear means there are no handles, and the curvature through that control point cannot be adjusted.

You can also place the cursor over a segment of the Canvas shape curve between two control points. This toggles the state of both control points at either end of the curve segment at the same time.

The Interpolation mode remains active until another mode is selected.

Tip: When you click to change the state of a control point, and hold down the mouse button, you can manipulate the point without switching to Edit mode. Once the mouse button is released, clicking again changes the state of the control point.

You can use the Quick Key: I to activate the Interpolation mode; keep key pressed to maintain mode.

• Quick Key: I	» Interpolation Mode

LINK SOFTNESS

When Link Softness is activated, moving a control point on the Canvas shape moves the corresponding softness point by the same amount. This allows you to quickly manipulate a shape without going back to reposition all the softness points as well. Even with Link Softness active, a softness point can be repositioned relative to the associated control point. It's only when a main control point is moved that the associated softness point is moved along with it.

TRANSFORMATIONS

Each Canvas shape has parameters for Translation, Scale, Rotation and Pivot. These values are shown in the Numerical Slates on the Canvas menu.

New	Axis		Edit	Add		Delete	Break		Join	L/C		Link Softness		Opacity	100.000
Trans X	0.000		Scale X	100.000		Rotate X	0.000		Pivot X	-75.911		Softness	0.000		
Trans Y	0.000		Scale Y	100.000		Rotate Y	0.000		Pivot Y	-20.049		Smooth			
Trans Z	0.000					Rotate Z	0.000		Pivot Z	0.000		50.0	100.0		
														Invert	Reset

You can adjust the numerical values of any of these parameters at any time, regardless of which Canvas mode you are in. When the Axis mode is active, the transformations can be controlled through on-screen manipulators. A bounding box surrounds the Canvas shape, and an Axis indicator shows the location of the current Pivot point.

TRANSLATION

Translation is the X, Y and Z position of the Canvas on the image. To change the Canvas position, place the cursor within the

bounding box of the Canvas shape. The cursor changes to the translation cursor: ⊕. Click down with the left mouse button and drag the Canvas to a new location. You can drag the Canvas in any direction.
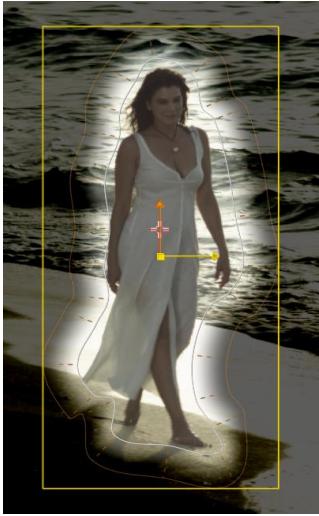
You can also place the cursor directly over one of the arms of the Axis indicator. The cursor changes to the point

manipulation cursor; ✦.

SCALE

Scale controls the size of the Canvas relative to its original creation size. To interactively change the scale of a Canvas, place the cursor over one side of the bounding box surrounding the Canvas. The cursor changes to the point manipulation cursor; the side of the bounding box will be highlighted. You can then click and drag to change the scale of the Canvas relative to the side of the bounding box you've selected. You can also click on the corner of the bounding box to modify both X and Y scaling at the same time.

Tip: Hold down the Quick Key: Shift before you click and drag to perform a proportional scaling. Proportional scaling is always done using the Pivot point as the center of the scaling.

ROTATE

Rotation controls the orientation of the Canvas about its pivot point. You can interactively change the rotation angle by placing the cursor over the tip of one of the Axis arms. A circle appears around the Axis indicator. With this circle present, click and drag to change the rotation angle of the Canvas.
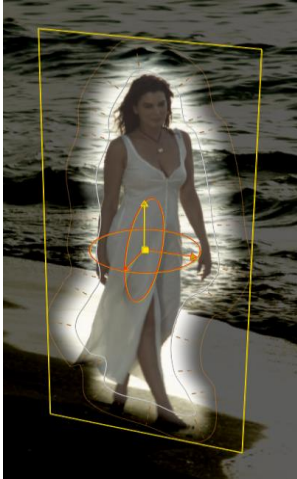
PIVOT

The Pivot point determines the center for scaling and rotation adjustments to the Canvas. The Pivot is also used as the base point for all translations as well. Adjusting the Pivot point by using the Numerical Slates modifies the position of the Canvas. You can also modify the Pivot point interactively by placing the cursor over the center of the Axis indicator. The center point will highlight and you can then click and drag the Axis to a new position. The Pivot and Translation values are both updated to reflect this change, but the overall position of the Canvas is not altered.

Note: All of the Transformation parameters can be animated over time using the SCRATCH Animation functions. See the section on ANIMATION in Chapter 7 for more details about how to animate parameters in SCRATCH.

SOFTNESS

The Softness parameters allow you to create a more seamless transition between the Layer and the image below. By increasing the Softness, you can smooth the edge of the Canvas shape.

SOFTNESS

The Softness parameter determines how far away from the Canvas shape the softness effect will extend. When softness is added, a second line appears around the Canvas shape to indicate the boundary of the softness effect.
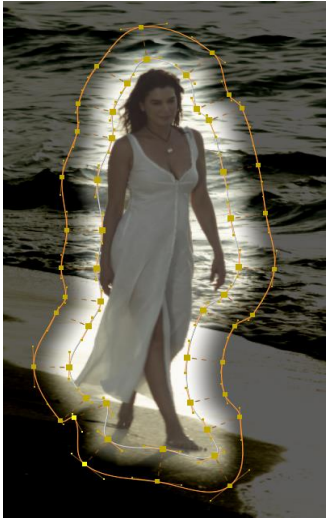
In Edit mode, each control point has an associated softness point. Each softness point is tied to a control point and is added or deleted along with the control point. The softness points can be repositioned independently from the control points while in the Edit mode.

SMOOTH

By default the soft-edge filter uses a Gaussian fall-off function to create a more even transition from the Canvas to the image below. The **Smooth** option button is for backward compatibility. When switched off, the softness function uses a linear interpolation function which was implemented in in older versions of SCRATCH. With the linear function, two additional parameters become available to fine tune the linear fall-off function, by implementing additional gain and gamma to the fall-off.

INVERT

The Invert button switches the Canvas, so that any color adjustments are applied outside the Canvas shape, instead of the default inside the Canvas shape.

OPACITY

The Opacity value determines the level at which a Layer is mixed with the other layers. By lowering the opacity of a layer you, can decrease its visibility. The Opacity control in the Canvas menu can be animated using the animation controls. More information about Opacity and Blending modes for Layers can be found in paragraphs on on Layers interactions and Textures, later in this chapter.

RESET

The Reset button reverts all the Transformation values back to their defaults.

DEFORMATIONS

Selecting a the **Bicubic** option in the Shape drop-down will create a rectangular shape with a raster of control points. The number of control points is set with the **Segments** button.

When switching the Canvas to **Edit**-mode the raster and control points become visible and you can deform the image by dragging the points.

Note: The Texture mapping mode for the Bicubic shape is always set to Pinned. Texture mapping modes are explained in more detail later in this chapter.

The same way as with a Free Form shape, you can add and remove control points along the raster, using the **Add** and **Delete** buttons.

CANVAS VERTICES ANIMATION

Rather than a single animation channel per vertex (as was the case in older SCRATCH versions), SCRATCH maintains a single Canvas Timing channel.

With this you can control the timing, pace and speed of the animation of the Canvas. Settings the y-value to a value greater than the x-value will speed up the animation. Vice verse, a y-value smaller than a x-value will slow it down. To move the animation as a whole you switch to Global mode and move all key-frames along the x-axis. To adjust the absolute position of a vertex you move the Player play position to the specific key-frame and re-position the vertex in the View Port.

04 - Layer Interactions

GENERAL

Each Layer has a set of controls for determining how the layer is blended with the base image and the other layers. These controls are: Opacity, Blend mode and Recursive. You can set the values for each of these properties in the Layers List in the Front (Opacity and RGB blend mode) and Matte (alpha blend mode) tabs

OPACITY

The Opacity parameter in the Front tab sets the level at which a Layer is mixed with the other layers. This control is linked to the Opacity control in the Canvas menu. Note that to animate the Opacity level of a Layer, you must use the control in the Canvas menu.

BLENDING MODES

The following modes are available for both RGB and alpha blending.

- Normal: Blend is a simple, non-pre-multiplied overlay of the image, using the value of the alpha channel to determine the opacity of each pixel.

- Over: Over is similar to Blend, except the foreground image is assumed to be pre-multiplied.

- Add: The foreground and background colors are added together. The overall value is multiplied by the alpha channel to determine the final amount that is added to the image.
- Subtract: Subtract is the inverse of Add, where the foreground color is subtracted from the background color.
- Multiply: Multiply looks at the color information in each channel and multiplies the background color by the foreground color.

For RGB / Front, the following additional modes are available:

- Screen: Screen is the opposite of Multiply, where the background is multiplied by the inverse of the foreground color.
- Overlay: Overlay combines Multiply and Screen blend modes. Light parts of the picture become lighter and dark parts become darker.
- Dodge: Dodge mode multiplies the pixel value of the lower layer by 256, then divides that by the inverse of the pixel value of the top layer. The resulting image is usually lighter, but some colors may be inverted.
- Burn: Burn mode inverts the pixel value of the lower layer, multiplies it by 256, divides that by one plus the pixel value of the upper layer, then inverts the result. It tends to make the image darker, somewhat similar to "Multiply" mode.
- Lighten: Lighten uses the lighter value between foreground and background images. Whichever value is higher is used in the resulting image. This is evaluated individually for each channel of the image.
- Darken: Darken uses the darker value between foreground and background images. Whichever value is lower is used in the resulting image. This is evaluated individually for each channel of the image.
- Negate: Produces the opposite effect to Difference. Instead of making colors darker, it makes them brighter.
- Soft light: Darkens or lightens the colors, depending on the blend color. The effect is similar to shining a diffused spotlight on the image.
- Hard light: Multiplies or screens the colors, depending on the blend color. The effect is similar to shining a harsh spotlight on the image.
- Difference: The Difference blending takes the absolute value of the subtraction of the source and layer pixel values.
- Exclusion: Creates an effect similar to Difference Mode but lower in contrast often smoother effect. Blending with white inverts the base color values. Blending with black produces no change.
- Color: The Color blending mode takes the chrominance of the layer and combines it with the luminance of the source.
- Luminosity: The Luminosity blending mode takes the luminance of the layer and combines it with the chrominance of the source

RECURSIVE

Each Layer also has a Recursive setting which determines whether a Layer will interact with the layers below it or if it will take the base image as its starting point. Recursion can be toggled on / off by clicking the '**R**' button that is available with each Layer in the Layer list. An empty button indicates that Recursive is off.

Tip: You can choose the default behavior of every new Layer by setting the **Recursive Layer** option in the Player User Configuration.

When Recursive is active for a Layer it will use the results of the layers below it as the starting point for any color grading. With Recursive deactivated the base image will be used.

Recursive Activated

Recursive Deactivated

05 - Masks

GENERAL

The Masks module in the Matrix allows you to create multiple shapes inside a Layer to add an alpha channel for masking areas or cutting holes in the parent Layer. Masks are rendered after a qualifier (and as such can e.g. be used to clean a qualifier). To prevent confusion - the shapes do not carry any grading information and are not intended for grading multiple shapes at once.
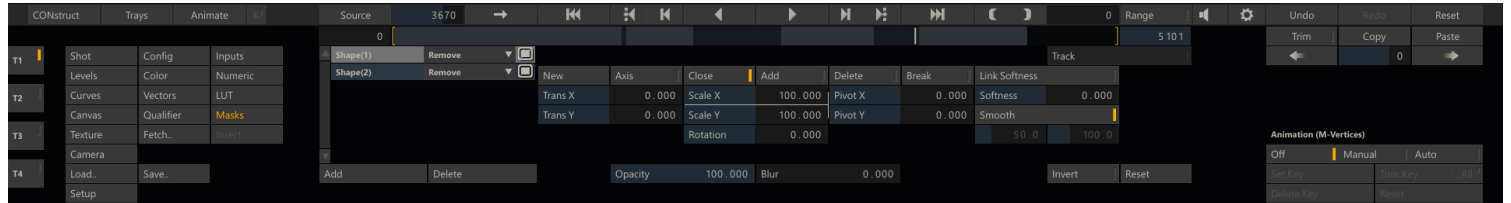
CONTROLS

NEW

If no shapes or (parent) Layer is present yet, the **New** button will create a new rectangular Layer and a new shape and the SCRATCH cursor switches to a green crosshair when placed over the View Port - similar to drawing a new Layer. Shapes in context of the Masks menu are always drawn in free-form mode. If a shape is already selected, the **New** button will remove the shape-canvas and allow you to draw a new shape.

ADD

The **Add** button will add another shape to the shape-list and allow you to draw the shape in the View Port.

DELETE

Removes the current selected shape.

SHAPE MODES

The drop down control next to the mask name allows you to set the mode: Add or Remove.

ACTIVE/DEACTIVATE

With the square button next to the mask mode you can activate / deactivate each shape individually.

OTHER CONTROLS

The other available controls on the **Masks** menu function identical to those on the **Canvas** menu, discussed earlier in this chapter - be it that the Shapes are based on 2D instead of 3D geometry.

COPY A MASK

You can make a copy of a mask by holding down the pen on a mask in the list. SCRATCH will add the copy to the pen and you can drop the it either in the Mask- or Layers List of the current shot or another shot. Note that this is always a copy - not a move.

06 - Tracking

GENERAL

You can use the Tracker in SCRATCH to lock a Layer animation to an object within the shot. The Tracker uses a sample of pixels from the image or the full shape, and looks for that same group of pixels on the next frame. Once found, the difference in position between the two frames is used to control the position, scale, rotation and deformation of the Layer. To track a Canvas, click the Track button on the Canvas menu. This opens the Tracking menu.
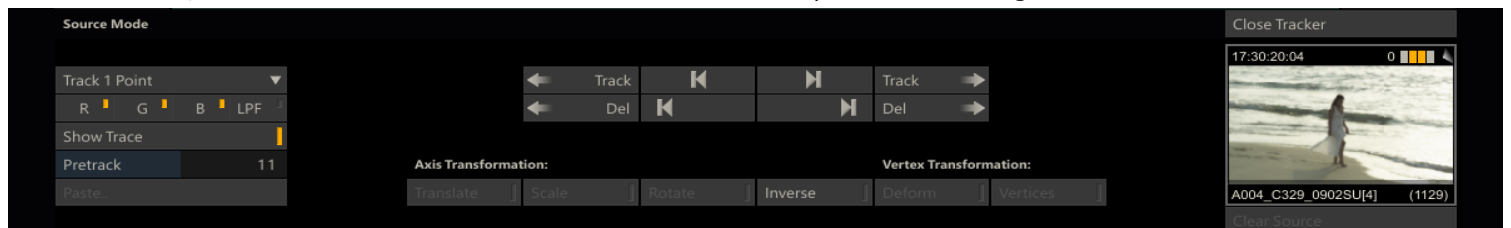
When the Tracking menu opens, all other Layers are hidden. The Player automatically switches into Source Mode and the image switches back to its native size if any Shot Framing has been added.

TRACKER TYPES

There are different track options available from the Track option list.
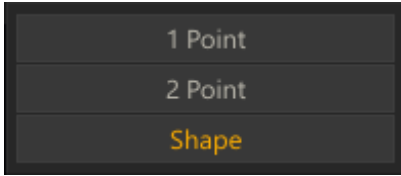
Point tracker

A point tracker consists of three parts: a position point, a sample region, and a search region.
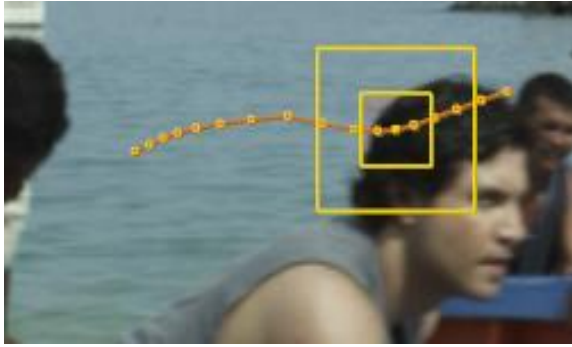
Position Point

The position point is represented by the crosshair at the center of the tracker. This is the X and Y position of the tracker, which is used to determine the transforms of the Layer. When you place the cursor over the position point, the entire tracker will highlight, indicating you can move the tracker by clicking on the position point to drag the tracker to a new location on the screen.

Sample Region

The inner box represents the sample region. The pixels within this box are used as the initial sample that is searched for subsequent frames. To resize the sample region, place the cursor over the sample box. It will highlight, and you can click and drag the sample box to change its size.

Search Region

The outer box represents the search region. This is the area within the tracker that will search subsequent frames for a match of the sampled pixels. To resize the search region, place the cursor over the search box. It will highlight and you can click and drag the search box to change its size.

2 point tracker

While a single tracker allows you to set X and Y Translation values for the Canvas, with two trackers, the Canvas is also animated in X and Y Scale. The change in distance between the two trackers determines the X and Y Scale offset.
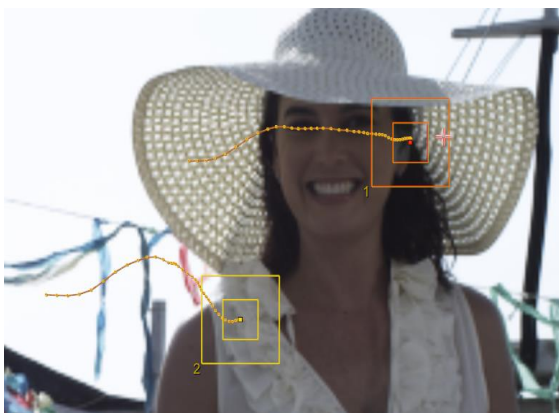
Tip: When working with 2 point trackers, try to choose tracking points that are as far apart as possible. A larger distance between trackers will yield better results.

Shape tracker

A Shape Tracker evaluates the whole Layer canvas and automatically calculates multiple feature points in the shape. Each of these feature points are tracked independently from one frame to the next and the results are combined to calculate the position, scale, rotation and deformation of the shape.

Note: The shape Tracker **must** be invoked with a *Free-Form* canvas.

SETTING UP A TRACK

Show trace

When **Show Trace** is active, the path connecting each keyframe in the track is shown in the View Port. This is helpful for finding errors in the tracking, or generally visualizing the tracking path. This only applies to the Point Tracker, the Shape Tracker will just shoe the single overlay of the shape.

Pre-tracking

As you position trackers on the image, SCRATCH will perform the tracking on the next frames in the shot and show you the results as a set of cross-hairs. This only applies to the Point Tracker, the Shape Tracker initializes by calculating its feature point set.
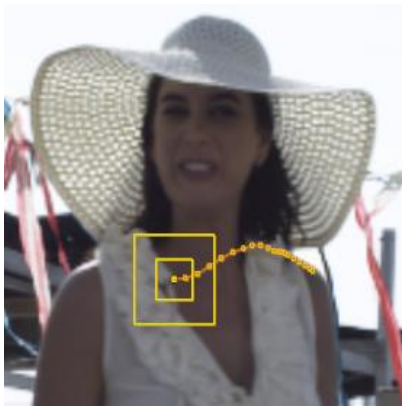
Pre-tracking can be used to determine the quality of a tracking point. If the pre-tracked information does not follow an expected path, the sample area may not be ideal. In this case, you can relocate the tracker to another sample area, or adjust the sample and/or search regions. A new set of pre-track information is generated based on the new settings. You can continue in this way until a satisfactory sample area is found.

To adjust the number of frames in the pre-track, change the Pretrack Numerical Slate value.

Tip: When choosing a tracking point, areas that contain high contrast and more distinct detail produce the best tracking results. In the case of fast motion, you may have to expand the search region so that the Tracker looks at a larger portion of the image for a match to the sample region.

PERFORM A TRACK

There are a number of controls to control a track, all controls are mirrored and can also be performed in a reversed direction. Once the tracking information is processed, you can close the tracking menu using the **Close Tracker** button. This returns you to the Canvas menu.

	Start the actual track
	Delete the current selected individual tacking point. You can also use the Quick Key: Backspace to remove a tracking point.
	Step to the next tracking point.

Axis transformation

These three buttons (**Translate**, **Scale** and **Rotate**) determine what Transformations will be keyframed by the tracker. As mentioned earlier a one point track only has the Translate option. A two point track can also calculate scale and rotation. The shape tracker can also apply a deformation to the shape itself. Deactivating any of the buttons removes that transformation from the tracking results.

Inverse

You can invert the tracking information by activating the **Inverse** button. All tracking information will be inverted. This can be useful for advanced shot stabilization. This option is only available for the Point Trackers.

Vertex transformation

Deform

Instead of tracking and then moving a shape the new tracker actually deforms the shape to match the changes occurring to the object underneath perfectly.

Vertices

The **Vertices** button can be used to replace contents on moving objects for example license plates and televisions. The vertices-tracker requires a shape with exactly 4 vertices, which will be used as feature points to track on.

CHANGE SOURCE

By clicking **Fetch** in the menu and dragging a new source node into the proxy widget, the tracker will use the new node to perform a track. After closing the tracker the resulting tracking data will be applied to the original shot. Use the **Clear Source** button to restore to original tracking source.

TRACK OFFSET

The position of a Point Tracker can be manually adjusted:

- When moving the Tracker to a new position while holding Quick Key: Control, the resulting animation channel will include the additional offset. When *not* holding the Control-key while re-positioning, the tracker will just continue from the new position and the animation channel will not include the offset.You can use this when the tracked object is obstructed.

- To change the position of an existing track point, hold down Quick Key: Shift and drag the point to its new position.You can use this to manually adjust the key frame.

When the search box of a (shape) tracker is repositioned during a track using the Quick Key: Control - the motion path is not affected and the object's offset path is shown in blue.
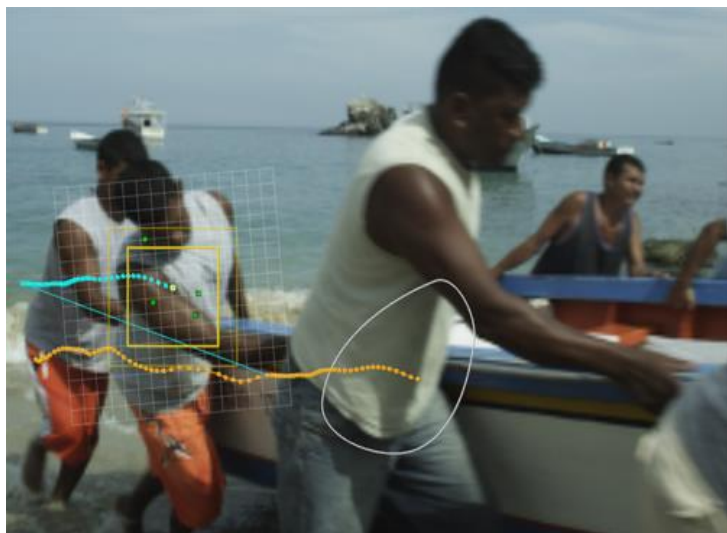
COLOR CHANNELS AND FILTER

With the **R**, **G** and **B** buttons you can selectively track on individual color channels. The **LPF** button adds a Low Pass Filter option to the tracker to help with tracking on images with high-frequency noise such as film-grain.

IMPORTING AND EXPORTING TRACK DATA

When in the Tracker menu you can use the general **Save** and **Load** buttons in the lower left corner of the Matrix menu to save the current track data or load external tracker data.Tracking data is exported or imported in a comma separated file format. A one point track has three columns: key-frame number, x-value, y-value. A two point track has two additional columns, the x-value and y-value of the second point.
0,861.000000,675.000000,704.000000,1008.000000
1,861.103638,673.776978,705.754028,1009.121826

2,860.858948,673.603821,706.700073,1009.195129
3,860.802368,672.376343,707.786072,1009.108704
......

Note: This only applies to point tracker - data of a shape tracker can not be saved or loaded externally.

IMPORTING FROM MOCHA

When you have the Mocha Pro tracker software from Imagineer Software Ltd at your disposal you can use its tracking data in SCRATCH by using the '**Assimilate SCRATCH Corner Pin**' format. Scratch can import that data using either the clipboard or a file. When the shape tracker is selected SCRATCH will recognize Mocha clipboard data and enable the '**Paste from Mocha'** (**CTRL+V**). Alternatively you can use the generic **Load** to import a data from file.

TRIMMING THE CANVAS POSITION

After tracking is complete the Canvas may not line up exactly with the intended location on the screen. In this situation, you can adjust all the keyframes by the same offset amount, using the **Trim Key** animation button in conjunction with the **All** button. By using this combination, all translation curves will be offset by the amount that you moved the Canvas. The **Trim Key** button is covered in the ANIMATION section of Chapter 7 – THE MATRIX.

07 - Qualifier

GENERAL

The Qualifier allows you to isolate a portion of the Layer image, not by its physical location on the image as you do with a Canvas, but rather by isolating portions of the image's color or luminance range by using color qualifiers.
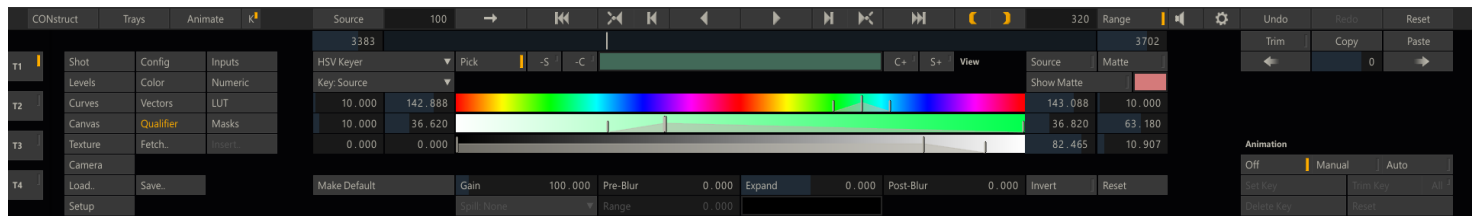
SCRATCH has several types of qualifiers that you can use. There are a number of qualifier types, available from the keyer type (**None/Canvas**) pull-down menu, just below the player controls. All of these qualifiers have a number of common elements and some specific elements.

Note: A color qualifier is applied on the shot after any selected Source Transform has been applied. See for details on Source Transforms in Chapter 08 - The Matrix.

COMMON ELEMENTS

The following are interface elements that are common to all the qualifier types.

KEY: TARGET

The first step in creating a Qualifier is to set the layer the keyer is be applied to. Even though the image in the View Port shows the fully graded shot, a Key can be picked from and applied to a specific layer. You can toggle the **Source** button (discussed below) to the right of the color-pot to switch in the View Port between the main image and the layer selected for the keyer.

Source

The base image without any grading.

Primary

The base image including any primary grading applied to it.

Recursive

The image including all grading and any (underlying to the current) Layers.

Tx Fill

The fill image used in the Layer

Tx Matte

The Matte image used in the Layer.

Note: When the current selected Layer already has a fill applied to it and a Qualifier is chosen, SCRATCH automatically sets the **Target** to *Tx Fill* and enables the **Invert** button (see below); this allows you to quickly add green-screen image to your shot.

PICK

The **Pick** button toggles the picking mode on and off. By default, if no Key has been set yet, the picking mode is switched on when entering the Qualifier menu. When hovering over the View Port the cursor will change into a color-picker ( ). When holding down the Control key, the color-Pot will show the current color under the cursor. Clicking the left mouse button picks the actual Key.

Rather than selecting a single color you can also use an **area select** by holding down the Control key and clicking and dragging the mouse over a certain area of the image you can select a range of colors which is used to set the initial values for a Qualifier or when the **C** or **S** buttons are enabled add or subtract the selected range to the Qualifier.

- Quick Key: Mouse Hover   » Show color-picker cursor
- Quick Key: Ctrl + Mouse Hover   » Update color-Pot to show current color
- Quick Key: Ctrl + Left Mouse Click   » Pick current color as Qualifier
- Quick Key: Ctrl + Left Click + drag   » Select range of colors for the Qualifier

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Note: If a key is already present when entering the Qualifier menu, the picking-mode is switched off by default to prevent accidentally overwriting of the key.

Note: While in the Qualifier menu you cannot change the position of the shape overlay of the selected Layer.

Note: While in the Qualifier menu you cannot change the position of the shape overlay of the selected Layer.

SOURCE

This button toggles the image in the View Port between the current shot and (when enabled) the selected Key layer.

MATTE

The Matte button toggles the image in the View Port between the current image and a black and white matte view of the key.

Note: The matte shown depends on the Qualifier Source selection

SHOW MATTE

The Show Matte button toggles the on-screen display of the current Qualifier selection (see section about Qualifiers, later in this chapter) using the color designated in the color pot to the right of the button. This on-screen display shows you which pixels in the current image will be affected by the Layer. This Show Matte can also be used by using Quick Key: M.

• Quick Key: M	» Show / Hide Matte highlight

To select a different color for the matte, click on the color pot and use the Color Selection Palette to choose a new color.

MAKE DEFAULT

You can use the Make Default button to set a particular Qualifier configuration as the default settings. To do this, select a Qualifier and set its values to your desired defaults. Click on the Make Default button and confirm you want to replace the standard defaults with the current settings. Now when a new Qualifier is created or the Reset button is pressed, the Qualifier will revert to the new values.

GAIN

The Gain adjustment allows you to boost the value of the key signal generated by the Qualifier. This has the effect of increasing the affected range without having to change the Qualifier settings.

PRE-BLUR

The Blur adjustment allows you to apply a blur to the image as it is processed by the Qualifier. The actual image is not blurred; it's just the way SCRATCH interprets the image. This is useful for reducing grain noise when trying to isolate particular color ranges.

EXPAND

The expand functionality allows you to make the matte grow or shrink slightly.

POST-BLUR

This button allows you to apply a Blur effect on the Matte of the Qualifier.

INVERT

The Invert button reverses the Qualifier, so that ranges other than the selected range are affected. In essence, it inverts the key signal generated by the Qualifier.

RESET

The Reset button resets the current Qualifier back to its default values.

SPILL SUPPRESSION

When the key target is a Texture (fill or matte) the Spill suppression controls become available.

Range

With this button you set the range around key-color on which the spill-suppression is applied to

Mode

There are three different modes for spill suppression:

- **Recover**; this tries to restore the original color of the defined range.

- **Desaturate**; this desaturates the colors within the range set.

- **Color**; by selecting this an additional color-pot becomes available for you to select a color that is used to replace the defined range.

Note: When By selecting the Color-option and selecting a high-contrast color you can view the defined range in your image.

RGB KEYER

The RGB Keyer is targeted at isolating specific color ranges based on the Red, Green and Blue color channels. When selected, a color selection pot and three color selection sliders appear, which allow you to designate the color range of the RGB Keyer. You can choose the color either by selecting colors directly off the current image, or by using the color selection sliders.

DIRECT COLOR SELECTION

When the RGB Keyer is first activated, a 50 percent gray color is selected by default. To change this color, click on the color pot, hold the mouse button down, and drag over the View Port. Continue to hold down the mouse button, and as you drag around the image, you will be sampling values for the keyer. The results of this selection are shown using the Matte color.

You can interactively drag across the image until you find a proper color. Release the mouse button and that color will be set as the base color for the keyer.

Alternately, you can click once in the color pot. This opens the color Selection Palette, which you can use to select a new base color for the RGB Keyer.

You can use the buttons on either side of the color pot to fine-tune the color range.

-S removes selected colors from the Softness range of the key.

-C removes selected colors from the color range of the key.

C+ adds selected colors to the color range of the key.

S+ adds selected colors to the Softness range of the key.

The Qualifier color can also be controlled by using the following Quick Keys:

• Quick Key: Control	» Add to the colour range
• Quick Key: Shift	» Subtract from the color range

COLOR SLIDER SELECTION

In addition to selecting colors directly off the screen, you can also manipulate the RGB Keyer by adjusting the individual Red, Green and Blue color selection sliders.

Each slider has four values associated with it: Low Softness, Low Clip, High Clip, and High Softness. These are represented by the four Numerical Slates on the sides of each color selection slider, and also by the four vertical markers on the sliders themselves. The area in between the markers determines the range of each color channel that will be used in the Qualifier.

To adjust a parameter you can enter a new value in the Numerical Slate, or you can interactively drag the markers on the slider. Click on an individual marker and drag it to a new location. You can also click between the High and Low Clip markers to slide the entire set of markers up and down the slider.

HSV KEYER

The HSV Keyer is targeted at isolating specific color ranges based on Hue, Saturation and Value (or Lightness). When selected, a color selection pot and three color selection sliders appear, which allow you to designate the color range of the HSV Keyer. You can choose the color either by selecting colors directly off the current image, or by using the color selection sliders.

The methods for selecting the color are identical to the RGB Keyer described above, except that instead of designating individual Red, Green and Blue color ranges, you designate Hue, Saturation and Value ranges. The color selection sliders represent this difference.

HIGHLIGHTS, MIDTONES AND SHADOWS

Alternately, a Layer can be Qualified based on luminance ranges, which can be adjusted for precise control. The luminance ranges are defined by the shape of a curve. The area under the curve represents the luminance ranges that are affected by the Layer. There are three options for selecting a luminance qualifier: Highlights, Midtones and Shadows. These three options determine the base shape of the curve used to define the luminance range. This curve is displayed in the Curve Window area along with Tone, Offset and Range controls for adjusting the shape of the curve. You can modify each of the controls and see the effect on the resulting curve. The horizontal axis of the Curve Window represents a complete luminance range from zero on the left to 100 percent on the right.

HIGHLIGHTS

The Highlight curve increases from left to right so that it encompasses more values at the higher end of the luminance scale.
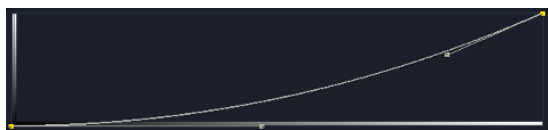
MIDTONES

The Mid-tone curve is symmetrical so that it encompasses values equally in both directions of the luminance scale.

SHADOWS

The Shadow curve decreases from left to right so that it encompasses more values at the lower end of the luminance scale.

TONE

The Tone control affects the amount of curvature the curve will have. Higher values flatten the curve closer to a straight line.

OFFSET

The Offset control adjusts the curve's position left or right. This has the effect of including or excluding certain luminance ranges from the qualifier.

RANGE

The Range control scales the curve around the zero black point, which is the left edge of the curve window. This isolates the curve to a larger or smaller section of the luminance scale.

CHROMA KEYER

The Chroma Keyer is especially useful for blue/green-screen footage. It isolates a part of the image by comparing its color channels. When you pick a color its dominant primary color is used as the reference channel. The level of dominance over the other channels determines the alpha of the matte. Where either of the recessive colours exceeds the reference channel the matte's alpha will be zero.

GAIN

The matte's alpha channel is multiplied by the gain value. When picking a color the gain is set as such that the resulting matte will have full alpha at that color.

SUB SCALE

The sub-scale parameter changes the scale of subtraction. With a sub-scale of zero there is no subtraction and the resulting alpha will be equal to the reference channel for the whole image.

POSITIVE / NEGATIVE

The effect of the positive and negative values is similar to the sub-scale parameter. But these values only influence the subtraction scale of one color instead of both.

DENSITY

The Density setting changes the proportions of the recessive colors' weight.

VECTOR KEYER

Finally the Vector Keyer allows you to isolate a range of colors based on color vectors. You can change the direction of the base vector using the Pick button. The Hue and Saturation of the picked color determine the direction of the vector. You can further define the inclusion area around the vector using the following parameters.

RANGE

The Range parameter is basically an angle setting that defines the size of a selection cone around the base color vector. All color vectors within this cone are added to the selection. When set to zero, only the base color is selected. At ninety all colors will be selected.

SHADOW / HIGHLIGHT

The Shadow and Highlight parameters cut off the darkest and lightest tones respectively. Both values range from zero to one, cutting off none and all respectively.

SOFTNESS

Range, Shadow and Highlight all have a separate Softness value. Using the softness value will result in a falloff for the associated parameter.

08 - Texture

GENERAL

The Texture is the actual image that is placed on a Layer. The Texture menu controls how the image is positioned on the Canvas.
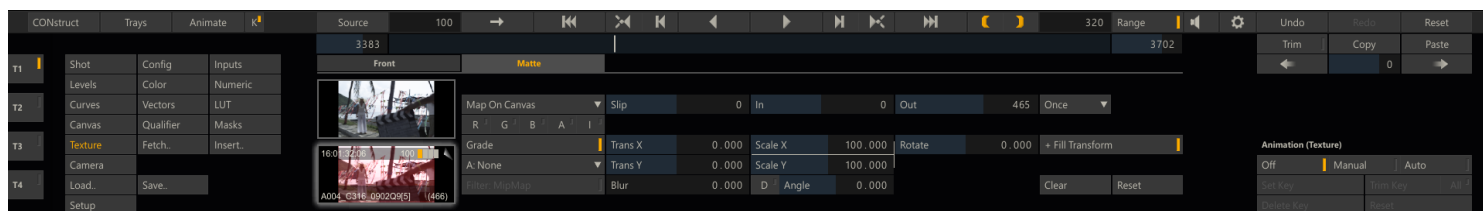
Each Texture has two parts: the Front and the Matte. The Front is the image that is visible on-screen. The Matte is a separate image that controls what part of the Texture image will be visible on-screen and how it will be blended with the other layers. On the left of the menu a proxy image of the Front (top) and Matte (bottom) is visible. By selecting the Front or Matte tab at the top of the menu, the controls for the element become visible - although the controls are next to identical. Use the +Matte / +Fill Transform buttons to link the controls of both elements and adjust both in one go.

LOADING THE TEXTURE IMAGE

By default, the base image is used as the Texture Front, and the Matte image is blank. You can modify these defaults in several ways.

FETCH

For a shot to be used as a Texture, it must first be loaded into a CONstruct in the current Project. When you click on the **Fetch** button at the bottom of the main Matrix menu on the left, the View Port will show the current CONstruct. You can drag and drop a shot into the Front or Matte thumbnail section. When dropping a shot into the Front or Matte section, the View Port will automatically return to the Player view.

Alternatively you can pick up shots from the current shot's staging area in the corresponding stack. When you pick up a shot from the Staging Area to be used as Front/Matte - a reference to that shot is used. In all other circumstances a copy of the shot is made before using it as Texture.

INSERT

The Insert button will open the Plug-in browser from where you can select an item to apply as Front or Matte. If a Front or Matte is already present, it is replaced with the new selected plug-in and set as input of that plug-in.

LOAD SCALABLE VECTOR GRAPHICS

By using the generic Load function in the Matrix and selecting to Scalable Vector Graphics (SVG) format, you can use an svg file as texture for the selected Layer. If no Layer is selected a new one is automatically created when loading an SVG file.

Note: SVG files can only be used on Windows systems with an NVIDIA graphics card.

MODIFYING THE TEXTURE IMAGE

When a shot is loaded as a Fill or Matte you can control how that shot behaves in relation to the base clip with a number of control.

TEXTURE MAPPING

Map Projected

When Map Projected is set, the image stays in a constant location within the working resolution of the CONstruct. In essence, the image is projected onto the CONstruct working frame, and will not be affected by the orientation of the Canvas.

Map On Canvas

With Map On Canvas set, the image is mapped onto the Canvas surface. This means it is affected by any change in orientation of the Canvas. This is the equivalent of the Texture image being 'painted' onto the Canvas. If the Canvas is rotated, the image rotates as well.

Pinned

Mode for Bicubic shapes; the texture is mapped directly onto the Bicubic (deformed) surface.

FRAME SLIP

The Frame Slip allows you to offset the relationship between the current base frame and the frame being used for the Fill or Matte texture. You can use the Frame Slip to align the timing of several shots so that all elements are synchronized.

Note: Frame Slip is only active when an alternate image has been loaded. It is not possible to slip the default image.

IN, OUT

The IN and OUT controls allow you to further synchronize the relation of the base shot and the shot used for the Fill or Matte texture by setting the in- and out points of that shot.

LOOP MODE

The LOOP MODE controls how the shot that is used for the Fill or Matte behaves if that shot is shorter than the base shot.

Once

The shot clip plays normally until the OUT point is reached. After that point, the final image is held as a freeze frame until the end of the base shot.

Loop

The shot plays normally until the OUT point is reached. After that point, the shot loops back to the IN point, and continues looping in this way until the end of the base shot.

Bounce

The shot plays normally until the OUT point is reached. After that point, the shot plays in reverse until the IN point is reached. The source clip continues to 'bounce' in this way until the end of the base shot.

Reverse

The shot plays in reverse, beginning at the OUT point and playing backward until the IN point is reached. After that point, the IN point image are held as a freeze frame until the end of the base shot. This is essentially the same as the ONCE mode, but in reverse.

COLOR CHANNELS

You can control which color channels (Red, Green, Blue and Alpha) are used for the Fill and Matte by activating the individual color channel buttons. The **I** button inverts the selected channels.

Note: When individual color channels are selected, they are represented as a grayscale image.

RECURSIVE (GRADE)

This option toggle the Recursive state of the Layer which determines how the Layer interacts with other layers (as described earlier in this chapter).

BLENDING MODES

The blending mode determines how the Layer interact with other layers (as described earlier in this chapter).

TRANS X, TRANS Y

The Trans X and Trans Y parameters determine how the Fill or Matte image is positioned on the Canvas. You can adjust the positioning by entering new values for these parameters. They can also be animated using the SCRATCH animation tools.

SCALE X, SCALE Y

Scale X and Scale Y determine the scaling of the Fill or Matte image onto the Canvas. This allows you to resize an image being used as a Texture. The Scale values can be animated using the SCRATCH Animation tools.

ROTATE

Rotate determines the rotation of the Fill or Matte image onto the Canvas.

BLUR

Each Front and Matte has its own independent Blur setting. By enabling the **D** button you make it a directional blur and you can set the angle of the direction with the **Angle** numeric slate next to it.

MIPMAP FILTER

This option allows for smoother animations of the Texture against its background by using MipMap filtering technique.

RESET

Reset all values to their defaults of the Front or Matte.

CLEAR

Remove the current Front or Matte shot, and revert back to the default base shot

09 - Camera

GENERAL

The entire Layers interface exists in 3D space. The properties of this 3D space are controlled from the Camera menu and determine how Layers are processed in the final output.
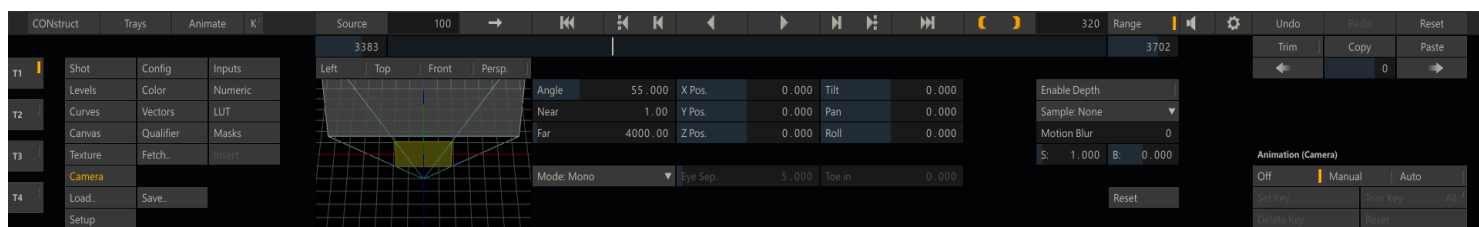
The left section of the Camera menu displays a 3D schematic view of the scene - the relative positions of the camera, Layer and back plane. You can rotate the schematic model in 3D by clicking and dragging it. Alternatively you can use one of the buttons to display the composite in the View Port from different angles:Left, Top, Front and Perspective. The Perspective view was already discussed in Chapter 5 - The Player and allows you to rotate the schematic scene in the view Port.

CAMERA CONTROLS

ANGLE

The width of the camera's viewing range. A wider viewing angle means more distortion as images move to the edges of the frame. A narrower viewing angle decreases the distortion of images near the edge. Since the base image must always fit within the camera angle, changing the angle is the equivalent, in actual camera terms, of a dolly out while zooming in.

NEAR

Distance to the near clipping plane of the camera's field of view. Any object closer than this will be clipped from the scene.

FAR

Distance to the far clipping plane of the camera's field of view. Any object further than this will be clipped from the scene.

X, Y, Z POSITION

Determine the camera position in the Scene.

TILT, PAN AND ROLL

Set the Camera's angle position and rotation.

ENABLE DEPTH

When activated, each Layer is layered based on its distance from the camera. This allows Layers to interact within the 3D space. When deactivated, Layers are layered based on their order in the Layers List and their distance from the camera is ignored for the purposes of prioritizing the layering.

SAMPLING

Increasing the number of multi-sampling for smoother animations with performance as a trade of.

MOTION BLUR

The main motion blur control set's the number of temporal samples to use for animations. In addition the **S** (scale) and **B** (bias) buttons control the extend of the blur over time and before or after the current frame.

RESET

Reset all controls to their default values.

STEREO SETUP

For Stereo setups you can define two camera's in the 3D scene and set the relative position (**Eye Separation**) and angle (**Toe In**) between them. On each Stereo node, with both the left and right eye image as input, you create a single set of Layers. SCRATCH will then use the left camera to render those Layers on the left eye back plane and use the right camera to render the same Layers (but under a different angle) on the right eye back plane. Note that the Stereo camera is only visible in the schematic scene tool when an actual stereo node is selected.

09 - Process and Plug-ins

01 - Process Module

GENERAL

In Chapter 4 - The CONstruct the processing of Output Nodes has been covered; creating derived Output Nodes, adding nodes to the Process Queue and process the actual queue. The Process module allows you to render media from within the Player or add nodes to the Process Queue. You are not limited to only process Output Nodes but can also render Effect Nodes, in order to pre-process plug-in constructions for better performance on play back.

SHOT SETTINGS

The Shot Settings menu gives access to the various meta data properties of the current shot. All of which have been discussed before in Chapter 4 - The CONstruct when covering shot meta data of Output nodes.
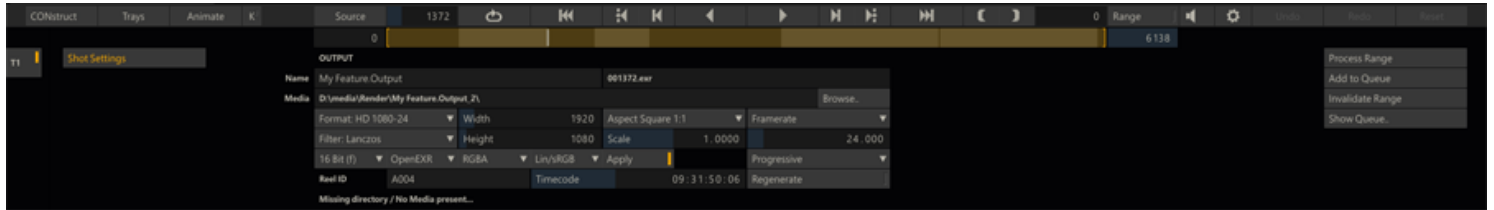
At the top of the menu you find the node type of the current shot. If the current shot is an output node or effects node the menu allows you to set parameters for rendering media. When no output has been rendered yet, a message is displayed at the bottom of the menu panel. As soon as output has been generated this message will be replaced, indicating that media is present for the node. If so, the **Browse** button will be replaced with a **Delete** button.

Note: When a plug-in effect has been used on a shot, the default location for processed images will be in a sub-folder of the original source material's location. This allows you to keep the new version of the shot in the same location as the original source.

PROCESSING BUTTONS

There are a number of controls and Quick Keys available to manage the processing of nodes on the right of the menu panel in the Process module.
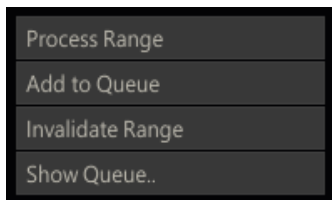
Depending on how you entered the Player, these menu button (located on the far right of the Process Menu panel), will be enabled, disabled or renamed.

PROCESS RANGE / SHOT

Depending if you entered the player with an Effect Node or an Output node this button will read Process Shot or Process Range. In both cases though, you can set a specific range on the Player toolbar to be processed. Pressing this button will add the node to the process queue but also start processing immediately.

Note: If no IN and OUT points have been set and the Range button is deactivated, the entire CONstruct will be processed if Process Range is used.

ADD TO QUEUE

This button will add the node and the range to the process queue but it will not start processing. Through the Process Queue dialog, discussed in Chapter 4 - The CONstruct, you can manage and schedule the processing.

INVALIDATE RANGE / SHOT

This button will invalidate any processed frames of the shot node or Output node. Invalidating means that the frames will not be physically removed but will be overwritten the next time the node is processed.

SHOW QUEUE

This button will pop up the Process Queue dialog as described in Chapter 4 - The CONstruct. The dialog allows you to manage and schedule the processing of nodes.

QUICK KEYS

For both starting to process a single shot or a range you can also use Quick Key: F12 or Quick Key: Control + F12 instead of the menu buttons.

• Quick Key: F12	» Process the current shot
• Quick Key: Control+F12	» Process the current Range

When you start processing a node or range, you will be locked out of the interface. The Main Menu area will become shaded and processing indicators will appear on either side of the Main Menu. A progress bar above the mini-timeline will inform you of the progress by displaying the number of frames processed, the total number of frames to be processed and an estimated duration to completion.

You can abort a processing task at any time by pressing the Quick Key: Escape . Any frames processed up to that point will be preserved.

• Quick Key: Escape	» Abort the processing operation

If the processing is restarted, it will begin at the point where it left off. This avoids having to re-process frames unnecessarily.

SCRATCH is always tracking which frames have been processed and will display the processed frames when playing back rather than having to process them on the fly. You can control this using the Output View Selector in the Player Settings menu.

OUTPUT PIPELINE VIEW

From the Player you can also open the Pipeline view of the output setup, as discussed in Chapter 5 - The Player about the Player navigation. You can open this View through the top View Port Control Bar of the Player.

If you click on an individual Output Node, the node is selected and you can update its properties in the Process Menu. When selecting a node, the Pipeline view will close unless you selected the **Keep** button. With the View button you can toggle between the proxy and icon view.

02 - Plugins Browser

GENERAL

The **Plugins Browser** allows you to see all the available third-party plug-ins available within SCRATCH and quickly locate individual plug-ins as well as create a separate list of Favorite and Recently Used plug-ins. The **Plugins Browser** is available from the **Insert** button on the **FX Ctrs** section of the Process menu.
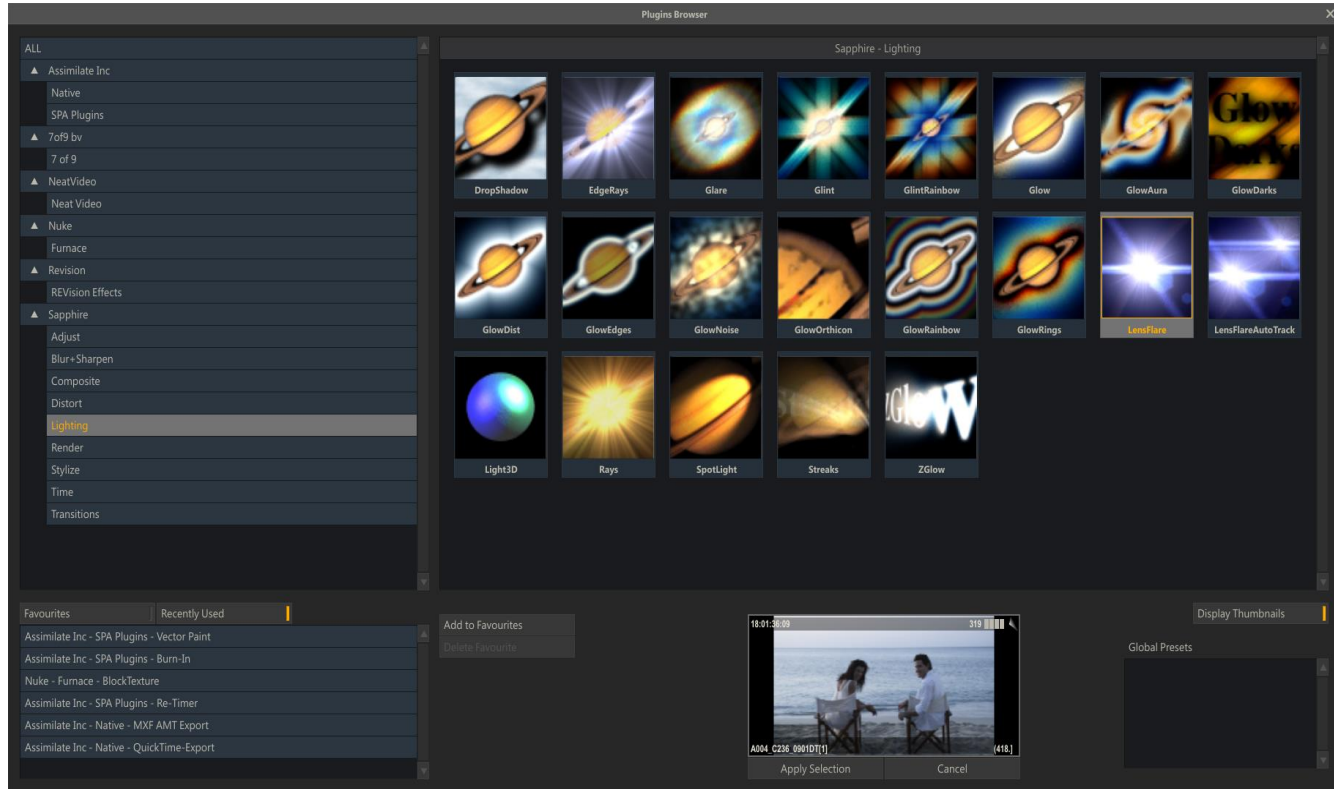
PLUG-IN SELECTION

PLUG-IN TREE

This shows all plug-in vendors and the groups of plug-ins they provide. There is the ability to select '**ALL**' plug-ins at the top of the tree list, which is the default selection unless one exists in the Most Recently Used List in which case that is used.

SELECTION LIST

The **Display Thumbnails** button will toggle the plug-ins list on and off, revealing a text based view underneath. By default it is ON.

Thumbnail view

This shows the all the plug-ins from currently selected plug-in group in image form. Where images are not available from the plug-in provider attempts are made to display the actual vendor's image and if not then the default Scratch logo is displayed.

Text view

This contains a text based list of all the plug-ins displayed in the Image List. The plug-in's version number can be obtained here.

FAVORITES AND RECENTLY USED

Favorite plug-ins can be added to this list for faster lookup. The list is alphabetically sorted. You can use the **Add to Favorites** and **Delete Favorite** buttons to maintain the list.

The Recently Used list is maintained automatically; each time a plug-in is used it is added to the top of the list. When the Plugins Browser is first opened it tries to select the top item Recently Used plug-in first.

Both lists are maintained on the user level, meaning that every SCRATCH user will have its own list of favourite and recently used plug-ins.

PLUG-IN OPTIONS

GLOBAL PRESETS

Settings for a plug-in can be saved as .pls files as explained earlier in this chapter. Presets can be made available from inside the Plugins Browser by saving them in the folder C:\Documents and Settings\All Users\Application Data\Assimilator\Settings\Plugins . When you select a plug-in the Plugins Browser, SCRATCH will check that folder to determine if there are presets available with the selected plugin. If there are, these will show in the Global Presets list section.

Note: Preset are by default stored on in the plugin folder of the current project. You can however navigate to the global plugin folder or copy preset files to the folder through Windows Explorer.

APPLY SELECTION

Clicking the Apply Selection will close the Plugins Browser and open the plug-in parameter menu. If a preset was selected the values of that preset will have been applied.

Tip: You can also double-click a plug-in icon to apply it on the current shot.

PLUG-IN CONFIGURATION

The Plug-in Browser relies on plug-ins being arranged in a proper structure so that it can work out the Vendor, Grouping and the Plug-in Image. This structure is slightly different depending on the type of plug-in.

- NATIVE ASSIMILATE PLUG-INS - These exist in SCRATCH's "bin" folder and have the file extension '.node'. If there is also an image present with the same name and a '.tif ' file extension then it will be displayed instead of the standard circle icon.

- GENERIC SPA PLUG-INS - These plug-ins can exists anywhere on the system. See Chapter 10 for more details on SCRATCH's plug-in search methods. If there is also an image present with the same name and a '.tif ' file extension then it will be displayed instead of the standard circle icon.

- OFX PLUG-INS - The structure for OFX plug-ins differ slightly with each Vendor. The general standard is for them to exist in the folder 'C:\Program Files\Common Files\OFX\Plugins '. Depending on how the Vendor has arranged their plug-ins, there can be a folder per plug-in or a single folder with all the plug-ins in it. If Scratch cannot find an image with that name it then tries to find one using the Grouping and then the Vendor names. If all else fails then the standard circle icon is used.

03 - Native Media Types and Plug-ins

GENERAL

SCRATCH comes with support for a number of media file formats - some of which have their own control set for decoding or rendering. Further, SCRATCH also includes a series of effect plug-ins which are available from the Plugins Browser, using the **Insert** button in the Matrix. All of which are listed here below and each of which are discussed in more detail in the remainder of this chapter.

- Apple ProRes (QuickTime) Encoder for Windows,
- ARRI raw; file reader for arri footage,
- Broadcast Wave Audio Writer; generate a bwf file,
- Burn In; include text, sub-titles and guides.
- Cinema Craft H264 writer; generate h264 in mp4 format (Windows only).
- Codec Support Pack (CSP) - including several file-formats. CSP is available as separate download and discussed more in Appendix D.
- Color Frame; pattern generator,
- Deinterlacer; for working with field-based information,
- FFMpeg reader; read various file formats using the (LGPL version) of the FFMpeg library.
- MXF Export; export MXF files
- Nest Node; used to animate the size and positioning of shots
- Pan Scan (deprecated); replaced by Process Node,

- Re-timer Node,

- QuickTime; read / export QuickTime format,

- RED r3d; file reader for r3d footage,

- Sony Raw; file reader for Sony raw footage,

- Stereo; process stereo pattern,

- Vector Paint; paint utility.

Each of these node types have their own set of controls which is available in the **Shot** menu in the Matrix. For file-writer / output nodes the controls are also available in the **Output** menu in the CONstruct.

04 - RED R3D, ARRI, SONY, CSP and FFMPEG

RED R3D

When working with RED .R3D media, there are two important aspects that you need to address; Image Extraction and the initial Color Transformation. For these steps SCRATCH uses the RED SDK software library which can optionally be used in combination with a Decoder Accelerator card (Red Rocket) to increase performance of image extraction. SCRATCH will automatically recognize the card.

Note: You can use **multiple Red Rocket** cards in a single system. SCRATCH will use all cards in its pre-fetching scheme which will boost performance further. This is especially useful in Stereo projects. Alternatively you can prevent SCRATCH from using any cards present by setting the SConfig variable R3D_DISABLE_RR.

The controls for managing image extraction and initial color transform for r3d media are available from the **Shot** menu in the Matrix and spread out over three tabs: **General**, **Color** and **Resolution**.

GLOBAL SETTINGS

The first menu tab is called General and contains settings that apply **global** - to all r3d media within the project.
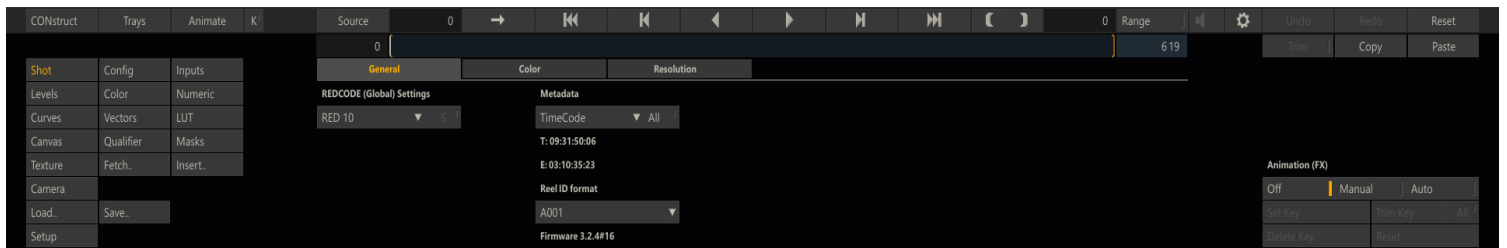
Decode

With the decode control you set the bit depth the image is decoded to; RED-16 means decode into a 16 bit RGB image, RED-10 into a 10 bit image, etc. Lower bit depths use fewer resources but do impact the image quality.

As of SCRATCH version 6.0 SCRATCH's own internal decoder - referred to as **S-RED** - for r3d footage is no longer available. Existing projects that made use of this option can still use it. However, as soon as you change the decode option you cannot revert back anymore. Also the with the SCRATCH decode integrated Squared Transformation (**S** button), is not longer available. The reason behind this change is that SCRATCH's decoder is unable to get information on the color science of a r3d file which is not publicly available. Without this information decoding returns a sub-optimal result.

Squared Transformation

No longer available for new projects. Please refer for details to SCRATCH version 5.2 manual.

Metadata: Timecode

The RED camera records two tracks of timecode into the .R3D files; Time of Day timecode and EDGE timecode. Time of Day timecode uses the camera's internal clock [or an external timecode generator, if used] as the source for the timecode. EDGE timecode is a contiguous timecode that spans across all clips on a particular piece of digital media; either Compact Flash or RED DRIVE. Both timecode tracks are available within SCRATCH.

The camera also adds an indicator within the .R3D file for which of these timecode tracks will be considered the PRIMARY timecode for the file. This indicator is important as it will determine which timecode track SCRATCH will read by default. It also determines which timecode is written into the QuickTime proxies generated by the camera and eventually used in offline editorial. So, setting this value properly on set is critical to a smooth post production workflow.

Note: The selected timecode applies to the **Track-level**; meaning that all shots (copies / versions) that reference the same physical file use the same timecode settings. Changing the setting on one shot will automatically change it for all shots referencing to the same file.

By clicking the **All** button next to the **Timecode** button will apply the selection made to all R3D shots in the current project.

Note: The selected timecode will be used for all conform operations, so it is critical that this value be set correctly.

Metadata: Reel-ID

This control allows you to adjust the Reel-ID for r3d footage to one of four formats: A001, A001C001, A00131XX, A001_C001_1231XX. Note that the setting is a project-wide setting and is applied to all RED shots, unless the Reel-ID of a r3d shot has been updated. Choosing a different Reel-ID format can be used for conforming using edit lists from third party systems where a different Reel-ID is used.

Color switch

No longer available for new projects. Please refer for details to SCRATCH version 5.2 manual.

RESOLUTION

Through this tab you can set the resolution to which you want to extract the image, which does not have to be the same as the original resolution the shot was recorded in.
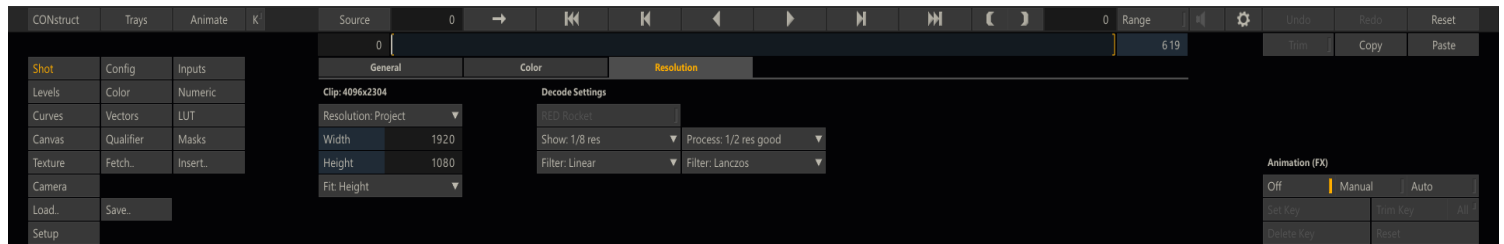
There are two important aspects to consider:

- The resolution is set **per** individual shot; even versions of the same shot can have different settings.

- If you are using a **Red Rocket**, the media is always decoded to the highest resolution and then rescaled on the card before returning the image to SCRATCH.

- When using **software decoding** you need to set a debayer (quality) resolution (full, 1/2 premium, 1/2 good, etc) and a filter to scale the result of the decode to the final target resolution.

Target Resolution

By default the target-resolution is set to the Project resolution. Next to selecting one of the standard resolutions (Film 4k, 2k, 1k and HD) you can also select Full, 1/2, 1/4 which relate to the original resolution the footage was shot in.

Width, Height and Fit

Next to selecting one of the standard resolution you can also set a custom resolution. If the target resolution has a different aspect than the original resolution you can choose to fit the height or width and as such crop the image.

Decode Settings

When using software decoding you set a debayer-resolution and a scale-filter both for viewing media in the Player (**Show**) and for rendering media in an output node (**Process**). These settings can be used to tweak between playback / process performance and image quality. The available filters are the same as for re-scaling / framing discussed earlier.

COLOR

The RED color transformation has a number of additional controls for applying a RED transformation.
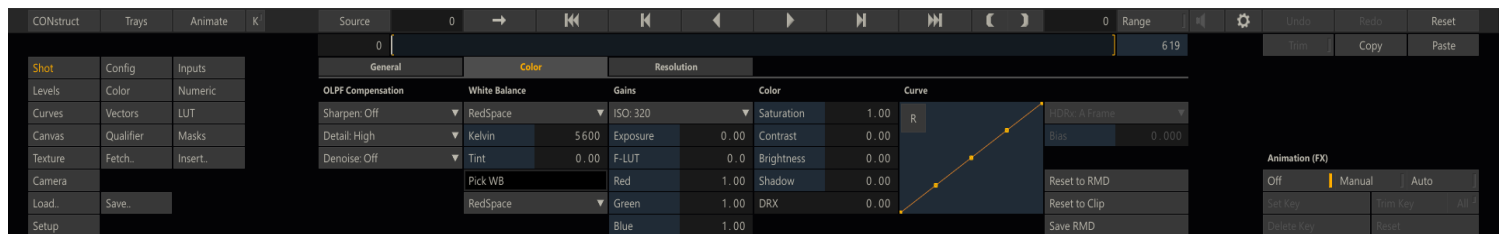
The default parameter values are set from the available metadata in a r3d file when loading a new shot, unless an xml metadata file is available (RMD). In that case the values of that file are automatically loaded. With the two **Reset** buttons you either reset the values back to those in the **RDM** file or to the metadata values available in the media file of the **Clip**. The regular SCRATCH Reset button resets the clip to RDM and if not available to the clip' meta data values.

Note: The **OLPF Compensation** controls are only available for software-decoding and not in combination with a Red Rocket.

ARRI RAW

Arri (*.ari) files are decoded using the ARRI-SDK. There are a number of parameters you can set for the decode.
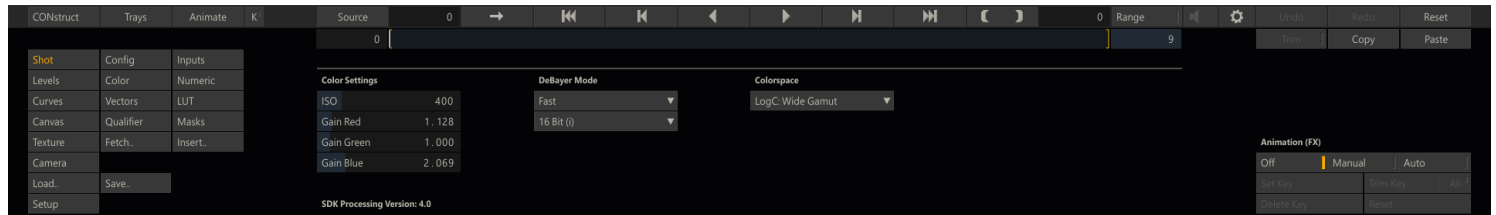
The initial decode values are read from the meta data of the underlying media file. Not all available **Color Spaces** and **Debayer Modes** can be applied to any type of ARRI footage; the available settings depend on the camera settings when recording and the *Processing version* of the media which is tied to the camera firmware and is displayed in the menu. If a combination of settings is not allowed a black frame is displayed and an error is logged in the standard SCRATCH log file.

There are a number of **Debayer Modes** available. The default debayer mode is SCRATCH's own 'Fast' mode which gives you the most performance for playback but at the cost of some of the image quality. The ADA - HW/SW debayer modes provided by the ARRI SDK, produce a sharper image but at the cost of performance.

Next to a debayer mode you select the color spaces to decode the image into. Note that not all debayer modes can be combined with all color spaces.

The underlying ARRI media file can include LUT (ARRI Look) data - added at the time of recording. If this data is present - it is always applied and can not be switched off.

SONY RAW FORMATS: F65, F55, F5, FS700

SCRATCH supports various SONY Raw camera formats wrapped in an MXF container.
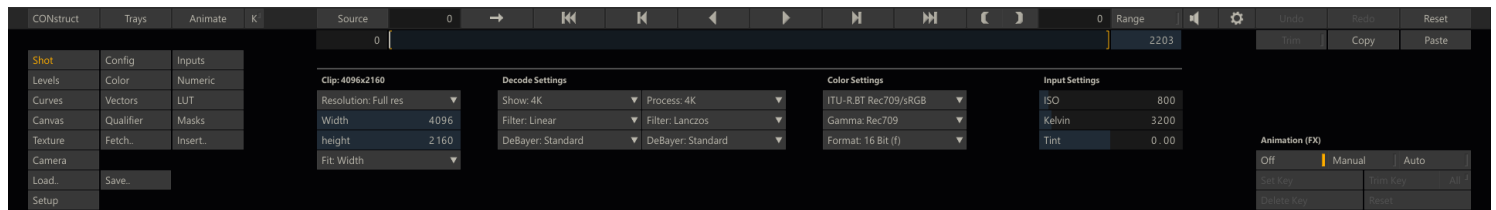
Setting the target resolution and decode resolution is similar as that for RED r3d media - discussed earlier in this chapter. Next to the resolution you set a target color and gamma space to decode to, the bit depth and the ISO, Kelvin and Tint to use with the decode.

The default debayer quality is Standard and the default Color and Gamma Space when loading is ITU-R.BT709/sRGB. Any in the metadata available ASC CDL values are automatically translated into pre-gain, offset, gamma and color B saturation.

Note: Sony Raw media has by by default 16 channels of audio, even though in most cases the channels are not used and only contain silence. When audio is switched on in SCRATCH all channels are processed. This might impact playback performance to a certain degree.

Note: The CSP, discussed later in this chapter - also includes support for SONY XAVC formats. Make sure when loading Sony footage to select the correct file-type in the file Browser.

CODECS SUPPORT PACK

The Codecs Support Pack (CSP) is available as a separate install / add-on to SCRATCH and extends the number of supported camera formats; AVC-HD, Panasonic MXF, Sony MXF, Cinema DNG, Phantom CINE, Cineform Mov and AVI. All additional available formats are viewable when you open the SCRATCH **File Browser** and select the **Formats** pull-down button.

All Files..	ARRI RAW (*.ARI)
All Formats..	FFMpeg H264/avc1
Custom Selection..	Sony F65/F55/F5/FS700/SR (*.MXF)
DPX/Cineon (.dpx .cin)	AVC-HD (.m2ts .mts)
Tiff (.tif)	Panasonic MXF (.mxf)
Jpeg (.jpg .jpe .jpeg)	Sony MXF (.mxf)
OpenEXR (.exr)	XAVC MXF (.mxf)
Targa (.tga)	Canon MXF (.mxf)
Windows Bitmap (.bmp)	Cinema DNG (.dng)
Silicon Graphics (.sgi .rgb)	DPX (Cineform) (.dpx)
Jpeg 2000 (.jpf .jp2 .j2c .jpx)	CINE (.cine)
Portable Network Graphics (.png)	MOV (Cineform & Sony MPEG-2) (.mov)
QuickTime (.mov .mp4 .avi .3gp)	AVI (Cineform) (.avi)
REDCODE (.r3d)	MP4 (Sony MPEG-2) (.mp4)
MXF DNxHD (.mxf)	RMF (Canon Raw) (.rmf)
AMT AAF (.aaf)	FFmpeg (*.*)
AMT MXF (.mxf)	

Some of the additional CSP formats have additional parameters for decoding available in the **Shot** menu.
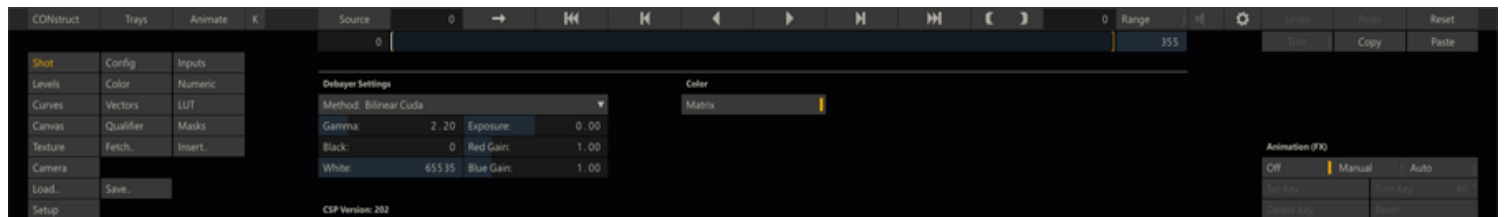
In general, the same recommendation as for the RED and ARRI formats apply in that the values should be kept on their defaults and do any grading with the available tools in the Matrix.

Note: When doing a **Load Layer** form the CONstruct it is recommended to select the specific format you require, rather than leaving the selection to **All Formats**. If not selecting a specific format, SCRATCH will check and try to load each file it encounters as a supported format, which will increase the time the process takes.

FFMPEG

SCRATCH comes with an LGPL version of FFMpeg for reading various file formats. It is the default decoder for mp4 files.
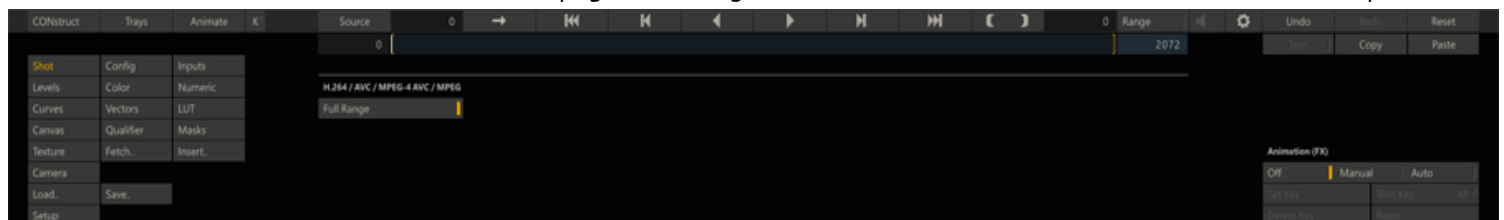
The Shot menu will display the name of the codec used. You can switch the image color range between full and video.

05 - MXF, QuickTime, ProRes, H264 and Broadcast Wave

MXF EXPORT

You can use the MXF Export plug-in to process output to various (DNxHD) MXF formats. For rendering MXF format SCRATCH uses the *AVID-AMT* library. This library produces a specific flavor of MXF, which can be read in most other systems that support MXF.

Note: The AMT library for SCRATCH is available in a **separate install-package** on the Assimilate support site in the Download section. Not installing this package will result in errors when trying to rendering MXF.
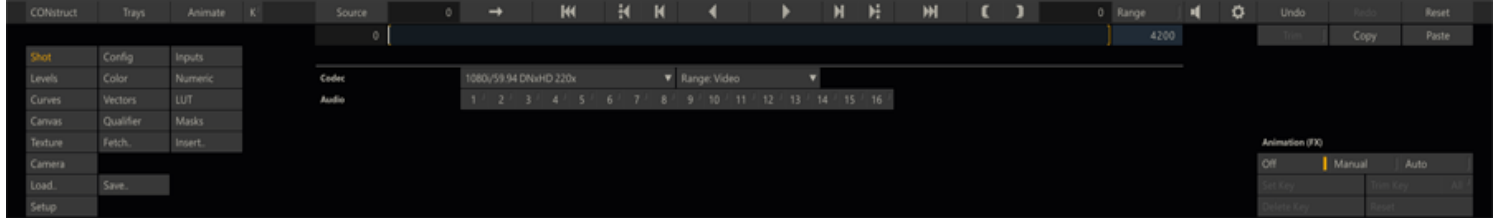
The plug-in allows you to select one of the output presets which specifies format, framerate, bit rate and bit depth. Bit depth is by default 8 bit. Presets ending with an 'X' are 10 bit. The **Range** button specifies if the color data of the images is scaled (**Video**) or not (**Full**). Next, you can specify which audio channels to include in the output.

The plug-in will export shots to a folder with one MXF file containing the image data and an additional MXF file for each audio channel that is exported. Next to the MXF, the plug-in will also create an AAF file that contains data to link the different MXF media files together again and an XML file with additional meta-data.

Note: You can only render out a timeline to a single MXF folder\file or to multiple MXF folder\files in separate folders. The AMT library does not allow multiple AAF/MXF shots in a single folder.

META DATA

Included in the rendered out mxf/aaf files is all the available meta-data of the source shot. Time-code, reel-id (as Tape-name) and sound roll as standard fields. All the shots' extended properties as well as the Project-, Group- and Construct-name are included as extended attributes / custom columns. If you do not want to include the extended properties you must enable the SConfig variable AS_AMT_NO_EXT_META_DATA.

QUICKTIME EXPORT

You can use the QuickTime Export plug-in to process the output of CONstructs into various QuickTime formats.
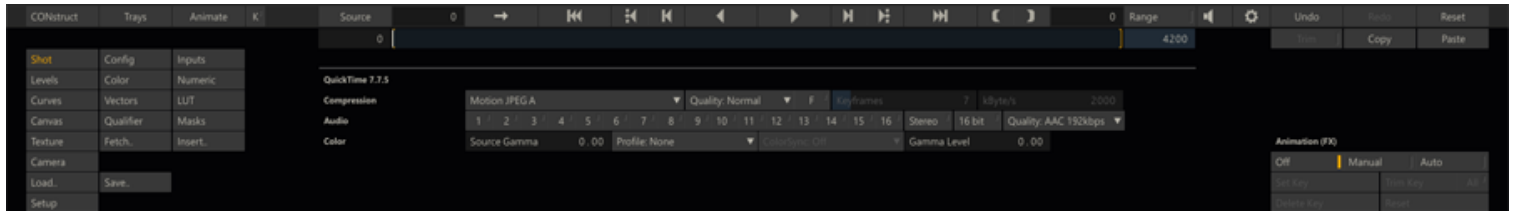
COMPRESSION CODEC

This pull-down menu allows you to choose which codec will be used to generate the QuickTime file. The pull-down lists all codec's that are loaded on the SCRATCH system. Any codec that has been loaded into Windows will be available to SCRATCH.

Animation	JPEG 2000
BMP	MPEG-4
Cinepak	Motion JPEG A
Component Video	Motion JPEG B
DV - PAL	PNG
DV/DVCPRO - NTSC	Planar RGB
DVCPRO - PAL	Raw
H.261	Sorenson Video
H.263	Sorenson Video 3
H.264	Targa
JPEG	Tiff

COMPRESSION QUALITY

You can choose the quality level for the QuickTime movie from the Quality pull-down. There are six options to choose from; Minimum , Low , Normal , High , Maximum and Lossless .

KEYFRAMES

Certain codecs will allow you to specify a frame interval for creating key image frames. This is how often the codec will resample the entire image.

DATA RATE

Certain codecs will allow you to specify a maximum data rate for the resulting QuickTime. This data rate is expressed in Kilobytes per Second (Kb/Sec).

Note: The optimal settings for QuickTime output vary greatly depending on the particular codec, the image size and the desired quality level. There is no one proper setting. You can adjust the values from the QuickTime Export menu and test with your imagery to find the best settings.

OUTPUT LUT

The QuickTime Export plug-in supports 1D and 3D LUTs for adjusting the levels of the resulting QuickTime file. The pull-down offers a quick Log to Lin conversion or you can load a custom LUT with the **LOAD** button. The name of the loaded LUT will be shown in the Text Slate.

OUTPUT SETTINGS

Switching to the **Shot Config** menu allows you to set the specifics of the QuickTime Export such as destination folder for the output, image size, frame rate and shot framing. This can all be set independently for the QuickTime Export.

AUDIO CHANNELS

You can toggle the available audio channels in the source material on and off to to include or exclude them from the QuickTime movie. You can output maximum of two channels of audio to Quicktime. SCRATCH uses the first two enabled channels.

STEREO

The options set the stereo flag the outputted QuickTime movie. This is purely a flag so external QuickTime players will recognize that the audio in the movie is Stereo; SCRATCH does not mix the channels.

COLOR TAGGING CONTROLS

Next to the basic options for encoding QuickTime there are a number of additional options for color-tagging and conversion. Note that all the additional options can have a different impact when used with different codecs - there is no one-size-fits all setting.

Source Gamma

This sets the Gamma level of the source image which so that it can be taken into account when encoding the shot. This is not an automatic process and the value can differ both for different source material as well a different QuickTime codecs. The

aim is to find a gamma value so that when reading back the rendered output in SCRATCH the shot is identical to the rendered source material; For H264 or V210 the optimum values is 2.2, for ProRes no gamma compensation is needed.

Profile

Possible values: HD709, SD-PAL, SD-NTSC. With this setting you can tag a QuickTime movie with a specific profile which is used by some viewers (QuickTime X) on decoding to determine the primaries / color space used, the transfer / gamma curve used and the matrix that is used for YUV to RGB conversions. There are three (most commonly used) profiles available. Note that SCRATCH itself is NOT using the profile on decoding.

Color Sync

Currently only available on OS X / QuickTime X. This option uses the profile of the monitor for encoding the image. The movie is tagged and some viewers will do an additional conversion when decoding the movie using the monitor profile of the monitor used to view. This option will on prevent any color shift when viewing a SCRATCH rendered QuickTime movie in the QuickTime X viewer but will look different when loading back into SCRATCH. Also the additional conversion will have an impact on render performance.

Gamma Level

This is an additional tag that is used by some Viewers as an additional gamma shift upon decoding an image.

QUICKTIME FILE READER

When you load an existing QuickTime into SCRATCH, the FX Controls menu will show you additional configuration settings for playback; Bit-depth and Quality. The actual effect of the settings on playback depends in the end on the specific codec with which the QuickTime was originally created.
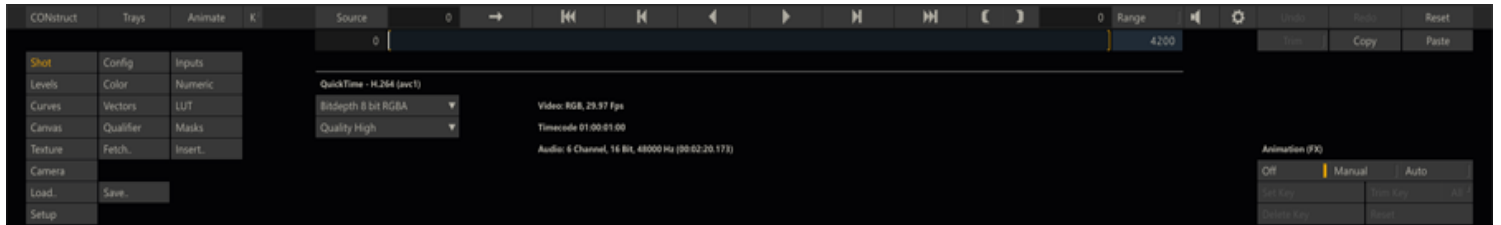
For some QuickTime codecs SCRATCH is unable to determine all properties required for correct playback from the file alone. For this SCRATCH has two addition SConfig file variables to which you can link a specific codec by adding the codec's identifier to it. The identifier is displayed after the name in the FX Ctrl menu. The settings are:

- QT_10BIT_CODECS - QuickTime media using these codecs are by default managed having a bit-depth of 10.

- QT_ENDIAN_DECODE_BYTESWAP - QuickTime media using these codecs are treated having a reversed byte-order.

APPLE PRORES ENCODER FOR WINDOWS

On OS X you can render ProRes using the regular QuickTime file writer. Render ProRes on Windows is done by a separate Apple ProRes Output node.

- Video - select the ProRes sub-format and if the sub format allows it, add an alpha channel.

- Audio - similar to the regular QuickTime encoder, select the channels you want to include.

CINEMA CRAFT H.264 ENCODER

The Cinema Craft H.264 encoder generated high quality encoded video even on relatively low bit rates. The encoder is for the time being only available on Windows and resolution is limited to HD.
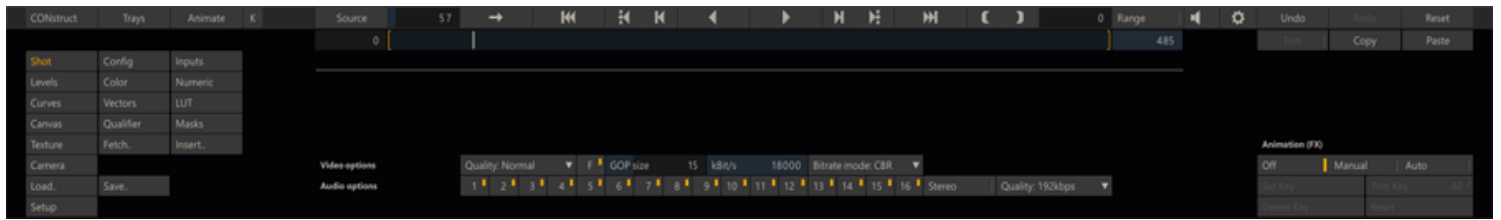
The H.264 is wrapped in a mp4 container. You can influence the quality and size of the encoded video using various controls:

- General Quality setting: Normal, Best or Fast (for playback performance).
- F - toggling on the fast-start option for web content
- GOP size and bit rate.
- Bitrate mode: variable or constant.

The audio can contain a maximum of 16 channels of audio.

BROADCAST WAVE EXPORT

Adding this plug-in allows you to write all audio data to a new Broadcast Wave file, including timecode. The plug-in does not have any additional parameters next to a regular output node (path / file-mask).

- When using different audio formats on the timeline the plug-in will automatically use the highest channel number and sample rate.
- Depending on the file-mask you set, a single or multiple audio files (per shot) are created.

Tip: In some cases having embedded audio can slow down playback performance and rendering out separate audio files per shot and linking them back to the shot might improve playback performance (for information on how to auto link audio to shots using the timecode - see the audio functions in the Media Browser described in Chapter 4 - The CONstruct).

06 - Burn-In

GENERAL

The Burn-in plug-in allows the creation of Text- and/or Guide overlays. The text can be plain text, codes that translate to metadata properties of the underlying shot or an external subtitle file. All text are displayed and rendered continuously on all frames or you can set flash frames to only include the text at the start and/or at the end of the shot. The plug-in has four tabs with controls: Text, Global, Guides and Flash.

MANAGING TEXT BLOCKS

You can add as many as 32 separate text-blocks on a single Text-Frame. The left side of the Text-Frame menu panel allows you to create new text-blocks, scroll through the existing blocks or remove a block.
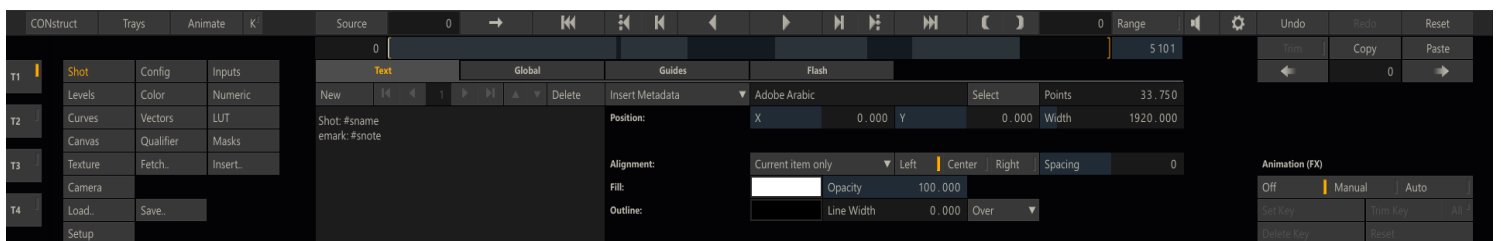
New

Creates a new text-block, after / in front of the current selected block.

Left / Right Arrows

Scroll through the first, previous, next or last text-block. The numeric display in the middle shows the index of the current block.

Up / Down Arrows

Change the position of the current text-block. The position also determines the render order of the blocks.

Text-Slate

Here you enter the text to be displayed. This can be plain text or metadata-codes similar to those used in the file-naming scheme for Output nodes as explained in Chapter 4 - The CONstruct. Possible codes are #sname or #stc, which translate into the name and timecode of the Text-Frame's underlying shot (if available). As an example; when a Text-Frame is placed on an Output node, the text '*current shot: #sname*' might display as '*current shot: myShot*'. Chapter 4 - The CONstruct contains a complete list of available codes that can be used in the File-Naming scheme and/or the Text-Frame.

Insert Metadata

This drop down button allows you to select a shot metadata code to be inserted in the current text block. The available codes were discussed in Chapter 4 - The CONstruct in relation to the file-naming scheme. A selected code will be inserted with a # prefix.

Use Format Tags: Bold, Italic, Underline and Color

You can add format tags inside to format part of the text in the text block. Use .. for bold, <i>..</i> for italic, <u>..</u> for underline and optionally add .. to specify a color.

TEXT BLOCK PROPERTIES

All text-blocks are displayed in the view-port image. The current text-block is displayed in a textbox-overlay. You can change the position of a textbox directly by clicking on it and dragging it while holding the mouse button down. Dragging the textbox from one of the two hotspots on the bottom border will alter the size of the textbox. Dragging the center point will only alter the size of the textbox, while dragging the corner point will also adjust the character size.
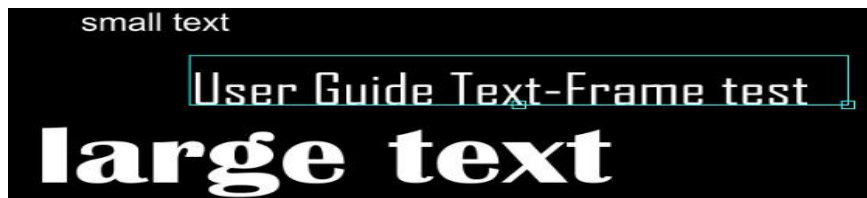
Alternatively from adjusting the position of a textbox directly you can also adjust the Position (X and Y values) and Dimension (Width and Points) controls. The Points control directly affects the character size of the text, the others only the position and dimensions of the textbox.

Font Select

This button opens a font-selection dialog, listing all available fonts.

Size and Position

Set the point size, X and Y position of the text block on the image and the width of the text block.

Alignment

This sets the alignment of the text within the textbox.

Line Spacing

Adjust the size of the spacing between lines that is used when the text has multiple lines.

Fill Color and Opacity

Use the color-selection panel to pick a color.

Outline

Use color selection to pick a color, set the line size for the outline and pick a draw mode: over or under.

Apply To

Set this option to Current Item Only or to ALL items to apply the alignment, fill and outline adjustments to the current or to all text blocks.

GLOBAL TAB

The Global tab has a number of settings that apply to all text blocks and functions to include an external subtitle file.
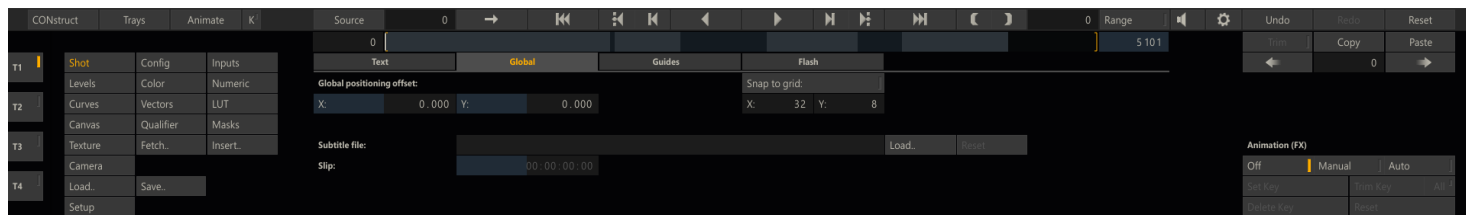
Global Offset

The X and Y values are added to the position of all text-blocks in the Text-Frame.

Snap to Grid

When this option is enabled, the position of any text-block in the Text-Frame automatically adjusts to align with a virtual grid. The spacing of the grid points are determined with the X- and Y-values that can be entered below the **Snap** button..

SUBTITLES

The Text-Frame has the option to read subtitles from an external file and displaying them at the correct timecode. The **Load** button on the Global tab of the Text-Frame allows you to load either a *.stl* or *.str* formatted subtitle file. After selecting a file, adding the code *#subtitle* to a text-block will display the subtitle. The two formats supported are both plain text formats. The *.srt* format is described on http://srt-subtitles.com/. The *.stl* format has different sub-formats, however SCRATCH supports only the text variant:

....
00:00:56:06 , 00:01:00:16 , first subtitle with in- and out-timecodes
00:01:00:21 , 00:01:05:24 , second subtitle | the pipe character represents a line-break
.....

Note: Any '$' tagged meta-data items at the beginning of an stl files are not processed by SCRATCH.

SCRATCH will pick up on any format tags for color, bold, italic and underlined text when encountering the tags specified earlier in this section. The **Slip** control on the Global tab of the Text-Frame allows you to adjust the timing of the subtitle display. The Slip value is added to the timecodes in the subtitle file.

GUIDES TAB

You can use one of the predefined guides from the **Guides** drop-down button or create a custom guide by using the **Left**, **Right**, **Top** and **Bottom** numerical buttons.
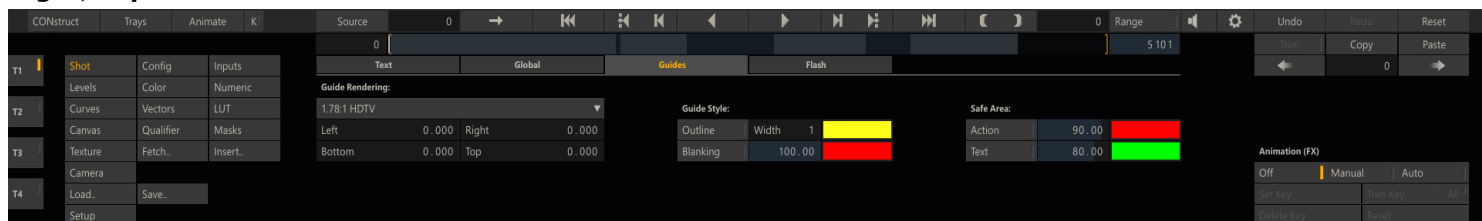
A guide is made up of several parts, or Cages: the base guide area, blanking, action and text safe regions. Each of these Cages can be customized separately from within the Guides tab. Each of the cages can have its own color and (relative) size. For the Blanking color you can also set the transparency level.

FLASH TAB

By setting flash frame options you can display the text and guides only at the start and/or end of a shot.
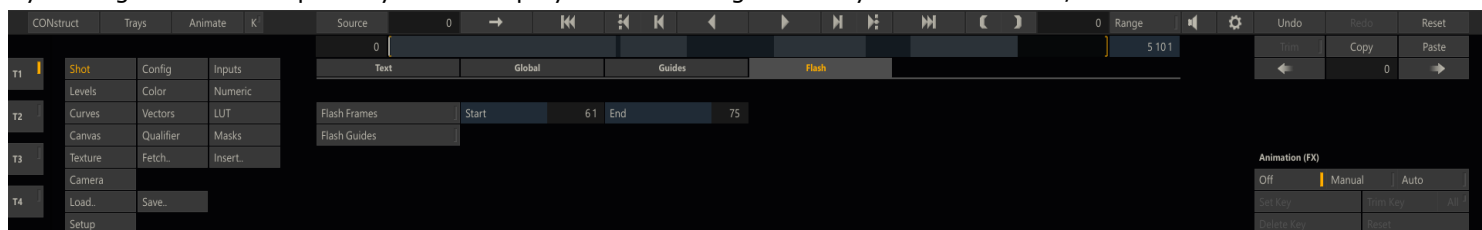
Flash Frames

This option switches the Flash Frame option on or off.

Start

Sets the number of frames at the start of a clip on which the texts are rendered.

End

Sets the number of frames at the end of a clip on which the texts are rendered.

Flash Guides

This option determines if any Guides that are set are also flashed or rendered on all frames.

07 - Deinterlacer

GENERAL

The De-Interlacer allows you to work with field-based information, and either extract or insert fields.

INTERLACE

The Interlace mode creates a new shot whereby one new frame is built from two successive frames in the source shot. The source shots alternate on each line of the new shot. The effect of this is to reduce the overall duration of the shot by half.

The **F1 Dominant** button allows you to control which image is used for each field in the resulting image. With F1 Dominant active, the odd lines of the resulting image come from the first frame, and the even lines come from the second frame.

DE-INTERLACE

The De-Interlace mode splits Field 1 and Field 2 from a single video frame into two separate frames. The effect of this is to double the overall duration of the shot.

The **F1 Dominant** button allows you to control the order of the fields in the resulting de-interlaced shot. With F1 Dominant active, Field 1 comes before Field 2. With the button deactivated, Field 2 comes before Field 1.

Note: When de-interlacing, the net result is a shot that has half the vertical resolution, since alternating lines were used to make up separate images. In order to maintain the same resulting frame size, each line is duplicated in the resulting image.

220

3:2 PULLDOWN

The *3:2 Pulldown* mode creates a standard 24 fps to 30 fps cadence correction. When converting 24 fps to 30 fps, there is a standard equation for how to make up the additional six frames per second.
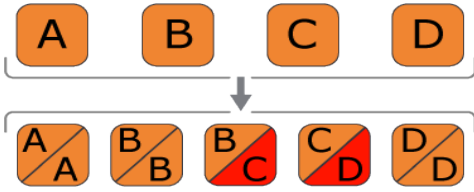
Film frames are placed in the individual fields of the 30 fps signal using an alternating pattern of two fields and then three fields. This process can be repeated six times per second to create the additional six frames. The **Offset** button can be used to shift the position of the first interlaced frame.

3:2 REMOVE

The *3:2 Remove* mode is used for extracting 24 fps material that has had a 3:2 cadence previously inserted. This is typically found in film-based material that was transferred to a 30 fps video standard.

Note: When removing 3:2, you can use the Offset parameter to determine the start point of the 3:2 cadence in the current shot. This will control how SCRATCH processes the 3:2 extraction, ensuring the correct cadence is removed. The Offset can be adjusted between zero and three.

24 to 25 / 25 to 24

The *24 to 25* correction adds an additional frame in the middle by interlacing two frames. The *25 to 24* mode creates the corresponding cadence by interlacing the middle frames.

08 - Nest Node, Color Frame and Re-Timer

NEST NODE

The Nest node (formerly known as Process node) is a type of Output node and allows you to wrap a shot with a specific grade into a new node and as such shield the grade.
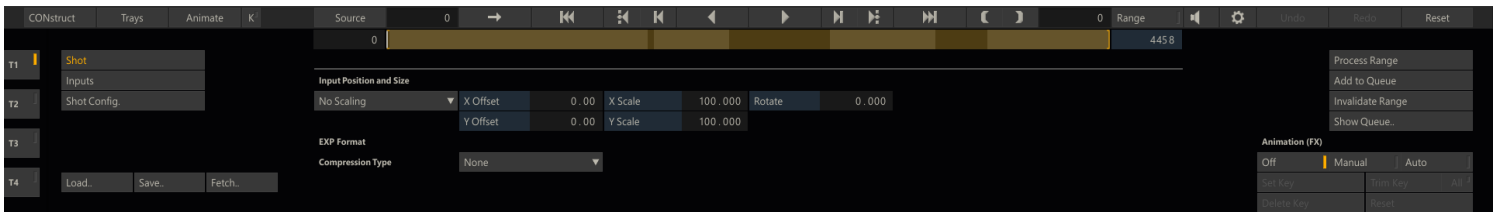
COLOR FRAME

The Color-Frame plug-in generates a single frame shot of a specific color or pre-defined pattern. The plug-in doe not have any inputs. The format of the Color-Frame is by default the project default but can be altered through the regular shot-config menus. There are a number of predefined patterns available: Color Bar 75%, Color Bar 100% (saturation), Gradient, Gradient Bar, Zone Plate and Color Circle. When selecting the Color-Frame option, a color picker becomes available through which you can set the desired color of the frame.
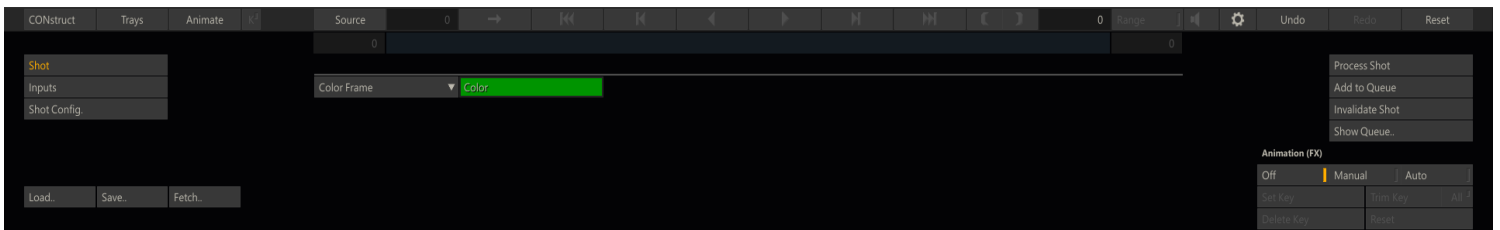
RE-TIMER
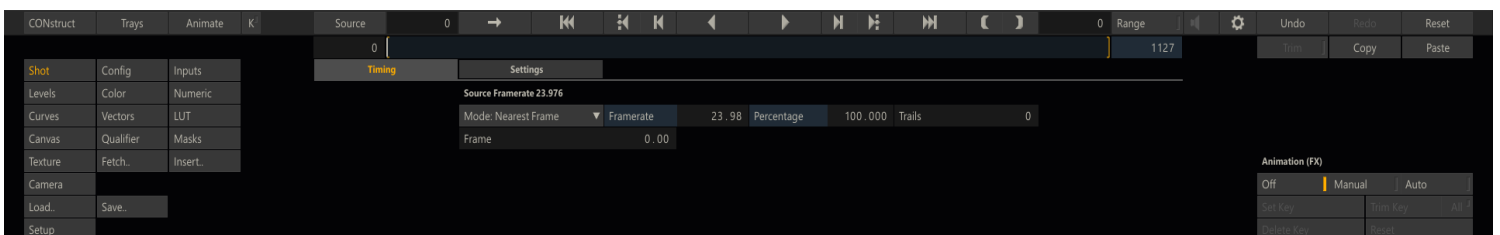
The Re-Timer plug-in has two modes: **Nearest** and **Rolling Mix**. The Rolling Mix modes does an interpolation of frames on a slow motion. On a speed up it will use the **Trails** value to determine the number of frames to use for a merge. The Nearest mode will just take the closest existing frame - the same as the existing vari-speed function in SCRATCH.
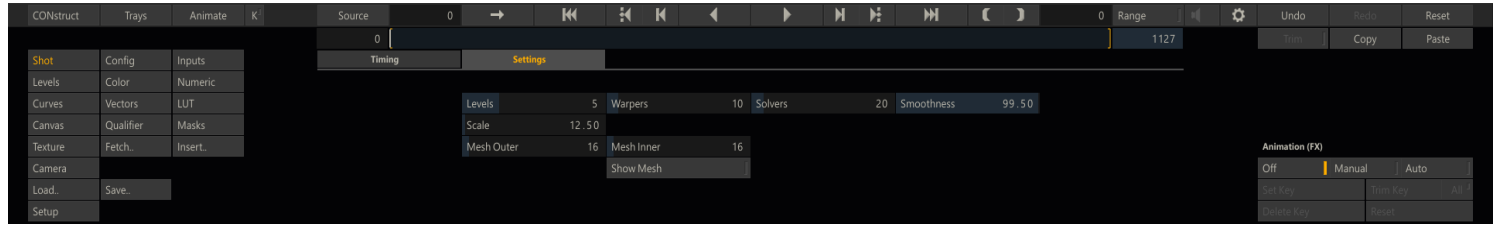
09 - Stereo

STEREO PLUG-IN

A stereo plug-in will in general not be instantiated on its own, but rather in the context of a stereo project and with SCRATCH's specialized functions for it.
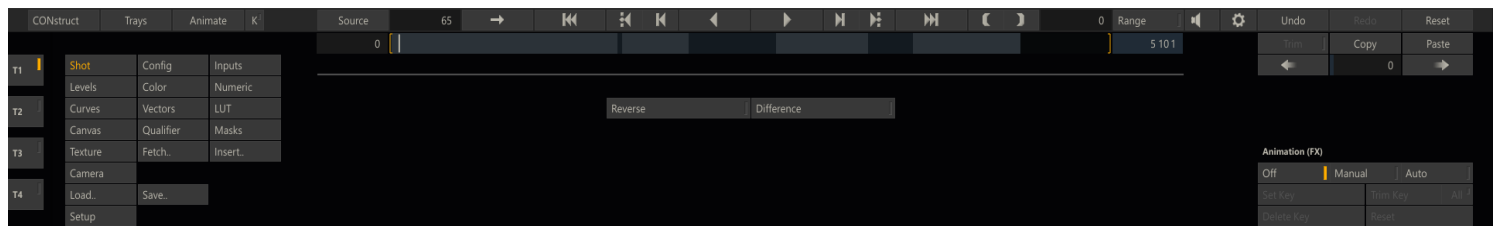
The plug-in takes two inputs, the left- and right eye shot, and has two controls: **Reverse** will switch the two inputs - left eye becomes right and vice verse. The **Difference** option shows you the difference between the two shots in a similar ways as the Over mode A-B view in the Player View Port.

STEREO PROJECT

A stereo project typically involves the following steps:

• Load all media using the Load Layer function. Depending on the folder layout you do this in one or two passes. The result being left eye shots on the first (timeline) layer in the CONstruct and the right eye shots above it on the second (version) layer.

• Next, use the Stereo Setup function in the CONstruct Media menu to create Stereo nodes from all left + right eye pairs; see chapter 4 - The CONstruct for more details.

• In the Player Monitor Settings, you can switch output modes / patterns for each of your monitors and single / dual view.

• You can grade on top of your Stereo nodes but if needed you can navigate the Layer Stack to work on the left or right eye separately. Using the framing controls in the Input menu of the Matrix you can link and adjust the framing of both left and right eye together.

• In the Camera menu of the Matrix you can define two cameras for you scene and as such render out the stereo with a single grade rather than having to copy the grade from left to right eye.

• In an Output node you can also set the desired stereo output pattern for rendering, using the **Stereo Override** option.
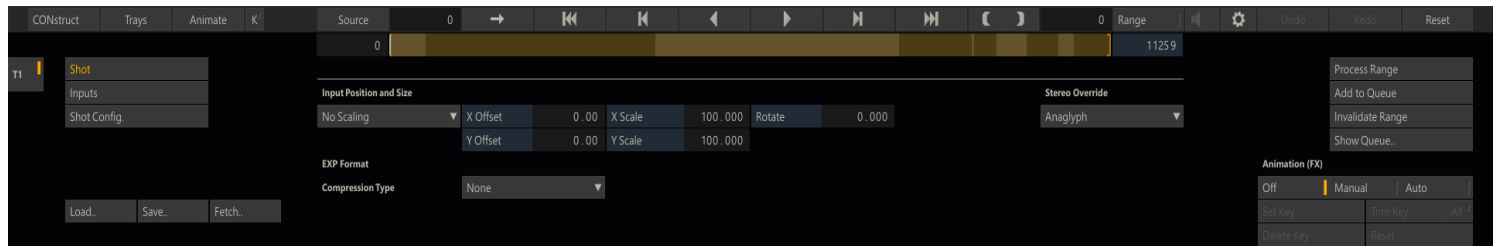
The Main output node will recognize a stereo node as its input and will then use the **Stereo Override** to generate a stereo pattern. You can also set this option on the Main Output to just render the left eye and then add an additional Output node at the same level(!) as the Main Output node and set that to render the right eye. See Chapter 4 - The Construct, the paragraph on Outputs on how to create additional Output nodes.

10 - Vector Paint

GENERAL

The Vector Paint plug-in replaces the previous available SCRATCHER plug-in and offer a more complete set of paint functions. The Plug-in has two tabs with controls. The first allows you to select a brush, a paint mode and a color. The second tab allows you to create custom brushes.

BRUSH, MODE AND COLOR SELECT
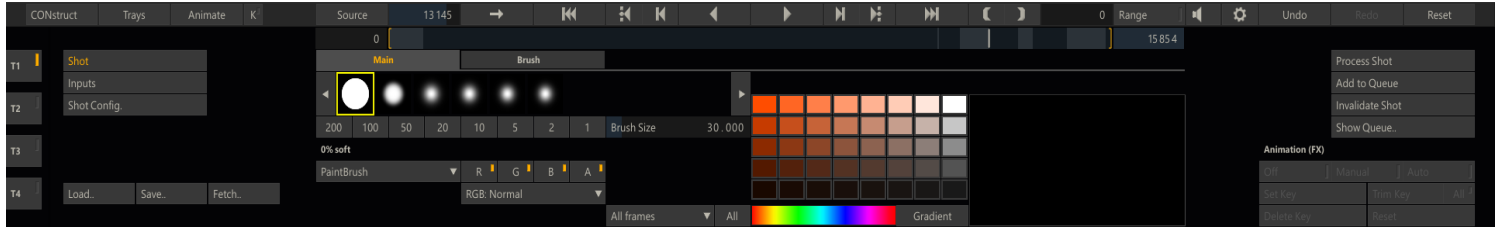
Brush Selection

By default the plug-in has six standard brushes to select from, differing in the level of softness. Any created custom brushes will be included in the list. Next to selecting a brush you can select a predefined size from the numerical buttons below the brush list or set a custom size with using the **Brush Size** numerical slate.

Paint Brush Mode

Normal paint mode using the color, color channel and blend mode selection.

Copy Mode

The Copy Mode allows you to select a color using Quick Key: Ctrl + left mouse click. This will select a position in the image which is marked with a yellow cross overlay. Any strokes made will use the color marked. Optionally you can use the **X**- and **Y**-Offset numerical slates to change the selected position.

Clone Mode

With the Clone mode you make a select a position in the image by using Quick Key: Ctrl + left mouse click. The position will be marked by a yellow cross overlay. Then, by holding down the mouse key and dragging to a second position you set an offset to clone the paint stroke from. You can also use the **X**- and **Y**-Offset numerical slates to change the offset between the paint position and clone source.

Reveal Mode

To use the reveal mode you need to add a second input to the plug-in in the **FX Input** menu panel. There you can set the **Reveal Source** input shot. When set, the Reveal Mode will paint the source clip, using the offset values set in the **X**- and **Y**-Offset numerical slates.

Preview

When using the Clone or Reveal mode you can enable the preview which will show the source image mixed in with the current image, using the opacity level set in the **Preview** numerical slate.

RGBA

You can paint on all or specific RGB and Alpha channels only. For both RGB and Alpha multiple blend modes are available.

RGB Blend Modes

The same blend modes are available as discussed in Chapter 8 - Scaffolds.

Apply to single Frame / All

This button allows you to set per stroke if the stroke is applied to the current frame only or to all frames of the current clip. With the **All** button next to it you can apply the setting to all strokes you did so far.

Color Selection

You can select a color by clicking the Color-pod to the right of the Brush Selection List. Alternatively you can click the color-pod, hold down the left mouse button and drag the mouse cursor to the desired color in the image. Next to a color you can set the **Opacity** level, using the corresponding numerical slate. The **Gradient** control to the right of the **Opacity** control allows you to select a color at each side and generates all gradients in between.

By clicking on one of the cells of the color palette that color becomes the current. By using Quick Key: Ctrl + click you can select a different color for that cell. Alternatively you can click the cell, hold down the left mouse button and drag the cursor to a specific color in the image.

The **Gradient** button below the Palette will update the Palette by calculating all gradients between the four corner cells of the Palette. Alternatively clicking a color in the **Hue** color-control below the Palette will use that color in the left upper corner of the Palette and show gradient of that color towards white and black in the Palette.

The scratch-pad to the right of the Palette allows you to try-out colors and brushes. Using Quick-Key: Ctrl+click on the scratch-pad will clear it to the default color - being the color of the right color-pod of the gradient control just above the pad.

Similar to brush settings, the palette is stored at the system level. In addition a Palette can be exported / imported using the generic **Save** and **Load** buttons in the Process menu. This allows you to create or load a Vector Paint Palete (*.vpp) file

CUSTOM BRUSHES

With the controls on the second tab of the Vector Paint plug-in you can create custom brushes.
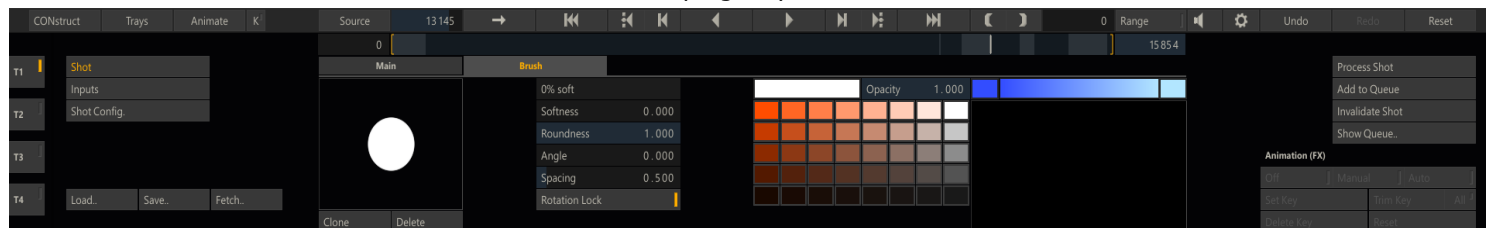
The menu shows the shape of the current selected brush. With the **Clone** and **Delete** buttons below the preview of the brush you can make a copy of the current brush for customization or remove the current brush. If the current brush if one of SCRATCH's predefined brushes you can not remove it and altering any of its properties will automatically crate a copy first. A Brush is stored at the System level - meaning that neww brushes are available to all projects. The controls next to the preview represent the properties of the brush.

Brush Properties

- Brush Name (displayed under the brush selection list)
- Softness
- Roundness
- Angle
- Spacing

  Note: You can use the generic **Load** and **Save** buttons of the Process Module to save or load a brush to a Vector Paint Brush (*.vbp) file.

10 - Collaboration Tools

01 - MyASSIMILATE

General

As of version 8 SCRATCH contains a number of collaboration tools that extend its scope beyond the desktop. Some of these tools work in combination with the MyASSIMILATE website. The collaboration tools are:

- **Project Repository** - share project through a central repository and maintain a change log of your projects.
- **Remote** - connect multiple SCRATCH systems with each other for a joined creative session: grading, compositing and editing.
- **Publish** - publish media from SCRATCH to SCRATCH Web for review. Share the media in a secure environment and load all feedback back into your SCRATCH project.
- **Galleries** - maintain SCRATCH grades and user settings with your on-line account so that they are available from anywhere and you can share grades with other users.

This animation video has a general introduction of the tools and is a good starting point. This chapter covers the details of the individual functions.

MyASSIMILATE

The MyASSIMILATE site at http://myassimilate.assimilateinc.com is central to a the collaboration tools but also covers other functions such as license management.

ASSIMILATE ACCOUNT

The MyASSIMILATE site requires you to log in with your Assimilate account: email and password. You can create an Assimilate account on the MyASSIMILATE site or on the Assimilate support site. This same account is used to access the various collaboration tools from SCRATCH. Note that certain tasks require special permissions - which are either granted by Assimilate Support or by an appointed SCRATCH user administrator.

SCRATCH WEB

SCRATCH Web is the on-line review application for media published from SCRATCH. In appearance SCRATCH Web is similar to a SCRATCH CONstruct. Currently the only way to add media into SCRATCH Web is to use the Publish function of SCRATCH. From there you can either publish a single output node or a complete CONstruct. The full publish function is discussed in detail later this chapter.

To be able to publish media into SCRATCH Web your Assimilate account has to be granted publish privileges by the Assimilate support team - making you a publish administrator. This means that you can publish media to SCRATCH Web and invite others to review this media. These others do not have to be granted publish privileges - they only need an Assimilate account. If they do not have an Assimilate account yet, one is automatically created for them when you add them to the access list and they are send an invitation email.

If you do not have publish privileges and neither have been invited to review a publication then SCRATCH Web will not contain any media and you will receive a message.

CONstruct Tree

Swipe left or click the left tab to show/hide the CONstruct List.

• The first CONstruct at the top of the list contains all single-shot publications.

• All other CONstructs are full construct publications.

Clicking the CONstruct opens it and gives access to the media. A publication can contain±

• only proxy images

• proxy images and still frames to view in a slide show

• proxy images and movies: if you select a shot a Play icon will appear in the shot proxy. Clicking it again will start playback of that shot.

• proxy images, stills and movies.

Use the buttons on the main toolbar to start a slide show of the available still images or press Play to start playback of the full timeline from the current shot onward.

Meta data

Each publication includes all available meta data with a shot. Swipe right or click the right tab to show/hide the meta-data stack for the selected shot. To read / add notes use the Notes button on the toolbar or Quick key: N. The notes editor works similar as in SCRATCH. You can enter multiple notes if needed.

Use the extend button (...) on the far right on the toolbar to show/hide the bottom menu. This menu will show additional data of the publication.

Admin

If you are the owner of the publication the bottom menu will show the Admin button enabled to enter the administrator module of SCRATCH Web. There you can update the publication title and description and mange the access to the publication: add / invite people by entering their email address or remove uses from the access list

GALLERIES

In SCRATCH you can store your galleries with grades and composites with your on-line Assimilate account. That way they you can ´take them with you´ to any SCRATCH system without having to manually copy files to e.g. an USB stick. The ins and outs of storing and synchronizing your settings with your Assimilate account are discussed in detail later in this chapter.

In MyASSIMILATE the Galleries section allows you to view and share looks and grades. The module is split in two sections.

• My Galleries - view your own private galleries. Clicking an item allows you to share the item with all other MyASSIMILATE users.

• Shared Galleries - view all shared items and click an item to add it to your own private galleries.

PROJECT REPOSITORY

A single repository holds a collection of SCRATCH projects that can be shared between a group of SCRATCH users. Typically a single repository is used by a facility. An individual can however have access to multiple repositories. A Change Log With is maintained with each project in a repository. How a repository works with SCRATCH is explained in detail later in this chapter. The Project Repository module in MyASSIILATE is used for user administration and for exposing the project Change Log to non-SCRATCH users.

Project List

Show the list of active projects in the selected repository. Each project shows the date the last change was made. You can click the selected project to open the Change Log which shows you all project changes, the date on which they were

committed and the user who committed them. From the Change Log window you can also change the name and status of a project. Projects that are deactivated are not removed from the repository but are no longer visible in the Project List.

User Admin

A new repository is created by Assimilate Support and is then assigned an administrator. This administrator can give others access to the repository and can also assign other administrators. From the User Administrator section you can add users by entering their email address. Note that this user needs to already have an Assimilate account. This account is not automatically created.

LICENSE ADMINISTRATION

MyASSIMILATE is also the portal to manage your SCRATCH licenses from. If you are assigned license administer privileges you will find an overview of all available licenses and their status. You have administrator privileges either because:

- you have been explicitly assigned administrator for an organization by Assimilate Licensing: email licensing@assimilteinc.com for any question regarding licensing.

- You bought a license through the Assimilate on-line store at https://store.assimilateinc.com and used the same email address as your Assimilate account.

The main Licensing page in MyASSIMILATE shows you all un-unsed (not yet activated) license keys, permanent and temporary licenses currently in use.

Extend Licenses

To easily extend temporary licenses select the licenses by clicking the checkboxes next to the license keys. Next, click the Extend button and then select the extension period. From there you are forwarded to the Assimilate on-line store with all info already filled out. The advantage of this route is that you do not need to copy-paste new license keys but only have to select the re-activate option in SCRATCH.

Emergency Licenses

If you have a valid temporary license key or a permanent license key with a valid support contract - you can use the emergency license option to create a temporary license that you can use on any system. There number of temporary licenses that you can create is limited.

PROFILE

From the profile page you can:

- update your profile: name, company, function.

- view the various administrator roles that you have been assigned.

- change your password.

02 - Project Repository

GENERAL

A SCRATCH Project Repository provides secure central storage for SCRATCH projects to be shared with others. A Repository holds an unlimited number of projects and works along thw following principles.

- You work on a local copy of the project on your system.

- Any changes you make you can commit into the Repository version of the project.

- Others have their own local copy of the project and commit their changes into the Repository version while downloading any changes made by others into their local copy.

- Any change you commit is accompanied by a short description - as such a Change Log of the project is build and maintained.

- Because you always work on the local copy of the project, you do not depend on an Internet connection. You only need a connection when committing your changes or downloading changes other have made.

- If your changes conflict with changes other have made in the project, SCRATCH allows you to resolve the conflict without any loss of data.

Note that a repository is only storing the project meta data and does not store or hold any media.

ACCESS

Typically an organization will have its own repository and assign an administrator to give certain users access. Creating a new repository and assigning the administrator is done by Assimilate Support. After that the administrator can use use the MyASSIMILATE site to give other access and even assign a new administrator. The MyASSIMILATE site was discussed earlier in this chapter.
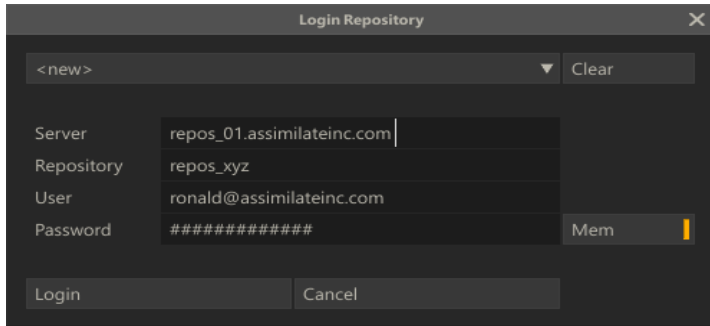
To login to a repository from SCRATCH you need:

- the server address (e.g. repos_01.assimilateinc.com)

- the repository name (e.g. repos_xyz)

- your Assimilate account: email and password.

If you have been granted access to one or more repositories you can find the server address and repository name in the MyASSIMLATE site. The **Mem** button in the login panel allows you to save your password so you do not have to enter that on each time you want to access the repository or other collaboration tools that require you to login.

LOAD A PROJECT

You can load a project from the Repository - meaning that you make your own local copy - by using the **Load From Repository** button under the Project list on the Startup Screen. After loging in to the repository you are presented with a list of available projects.
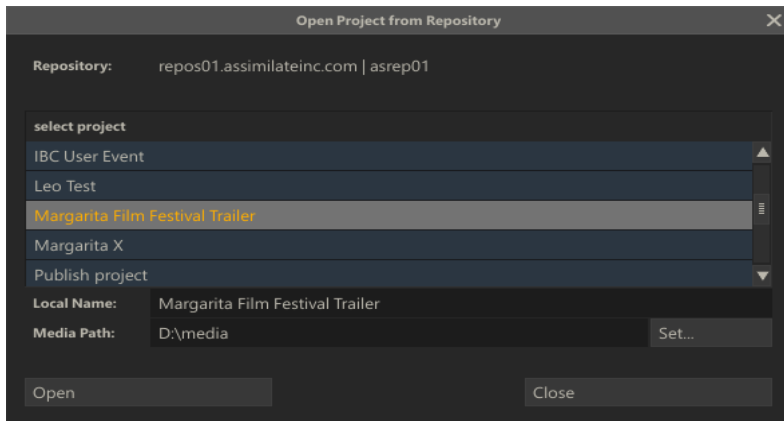
You select a project and set the local name you want to use for the project. By default this is set to the same as the name of the project in the repository but you can change this. It is possible to have multiple local versions of the same repository project. Next, you set the media folder for the project. Note that you can do that also after creating the local copy or change the media folder later - just like you can do with any project.

When clicking the Open button, SCRATCH starts to download the project from the repository and creates the local copy. The local project is now linked to the repository version but does not require an active link to work with.

LOAD AND COMMIT PROJECT CHANGES

Changes that you make in a project that is linked to a repository are reflected in the Project Tree by showing a colored bullet

A yellow bullet indicates that changes where made in the CONstruct after the last time the local version of the project has been synchronized with the repository version. A white bullet indicates a new CONstruct that has not yet been stored in the repository version.

To commit your changes to the repository version of the project and download the changes others made into your local version you use the **Sync with Repository** button from the Tool menu in the CONstruct module. You also use this function to add a *new project* to the repository.
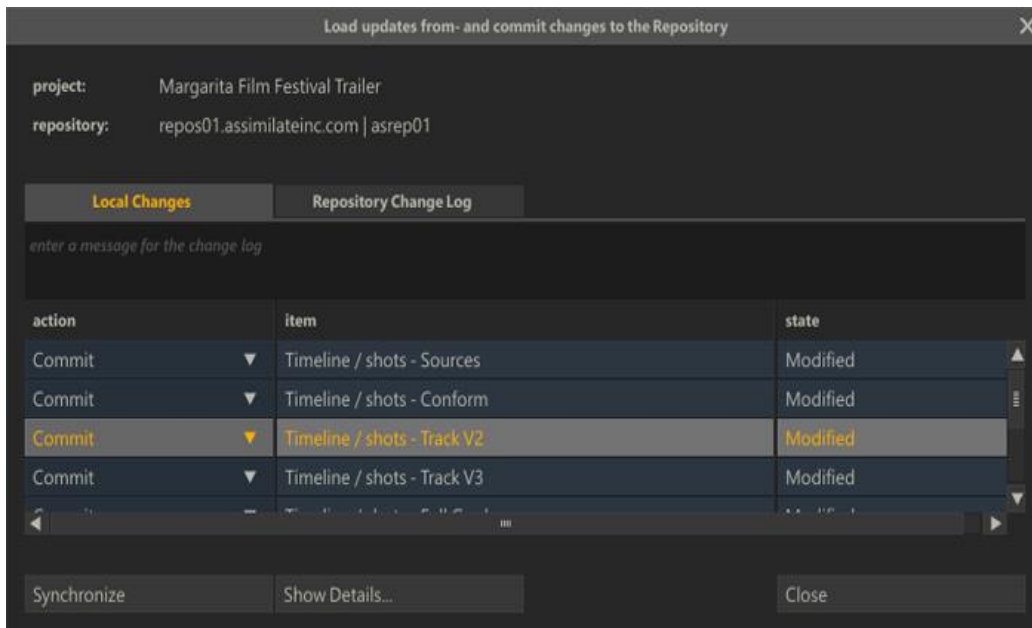
LOG ENTRY

In the top part of the Local Changes tab you enter a description for the Project Change Log. You only enter a description when you have changes to commit. When you only download other's changes no log entry is created.

LOCAL CHANGES

The grid holds all changes made since the last time the local project version was synchronized with the repository version.

Actions

Per changed item you determine what to do with the change:

- Commit - save the local change in the repository version of the project.

- Skip - do not save the local change to the repository version of the project but maintain the local change.

- Revert - revert the local change with the repository version of the item
- Copy - make a copy of the changed item, revert the original and commit the copy. This is mainly used in case of a conflict when the CONstruct you changes was already changed and committed by someone else. This action can only be used with a CONstruct.

Items

Changes are grouped together on certain levels:

- Project Defaults - any changes made through the Project settings menu in the Startup screen.
- Project Settings - any changes that were made to various project global settings like e.g. RED decoding values.
- Group - any changes that were made to CONstruct Groups.
- CONstruct - any changes that were made to a CONstruct, timeline edits or individual underlying shots.

Note that the Project Trays and User Settings are <u>not</u> part of the Repository version.

State

Show if the item is new, modified or was deleted from the local version of the project. In case of a new project has no Repository link yet - all items are marked as new.

SYNCHRONIZE

Start the synchronization process. For large projects this might take some time. When SCRATCH detects a conflict between the local version and the repository version the process is halted and you are required to update the **Action** with the conflicting item: revert, skip, copy.

SHOW DETAILS

This button is only enabled when a CONstruct item is selected in the change grid. This function opens a dialog with a list of changed items within the CONstruct.
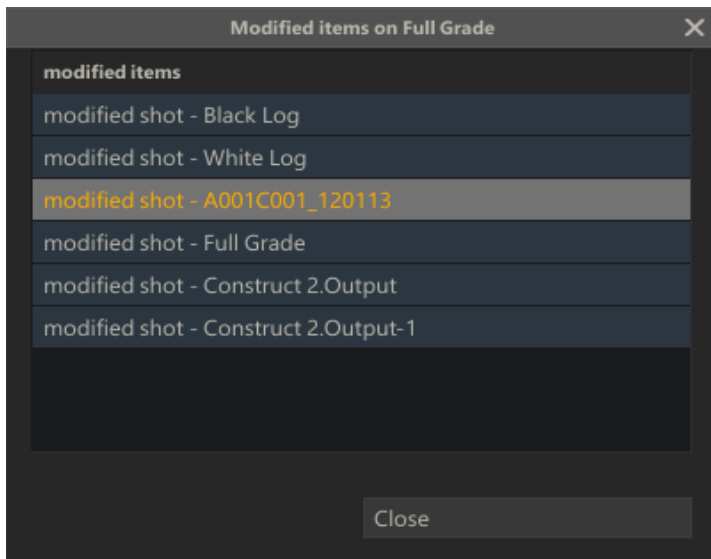
VIEW CHANGE LOG

There are different ways to view the Change Log with a project.

- While inside a project: click the second tab in the Synchronization dialog, available from the Tool menu in the CONstruct module.
- From the Startup screen: if a local project is linked to a repository the Change Log button is enabled and will popup the Change Log panel.
- From the MyASSIMILATE site: discussed earlier in this chapter.

The Change log contains:

- The date the changes were made

- The user that committed the changes

- The description that user entered with the changes

Also the yellow color of a change log entry indicates till what change the local version of the project database has been synchronized.

USER ADMINISTRATION

All access to a repository is managed through the MyASSIMILATE site and was discussed earlier in this chapter.

03 - Publish and SCRATCH Web

GENERAL

The Publish function allows you to generate media and post it to one of three targets directly: YouTube, Vimeo or SCRATCH Web. Post to Vimeo or YouTube are limited to singe shot media. SCRATCH Web can be used to publish a full CONstruct for review - including versions, all meta data and the option to load any feedback provided into the project.

PUBLISH

The publish function is available from the Tools menu in the CONstruct module.
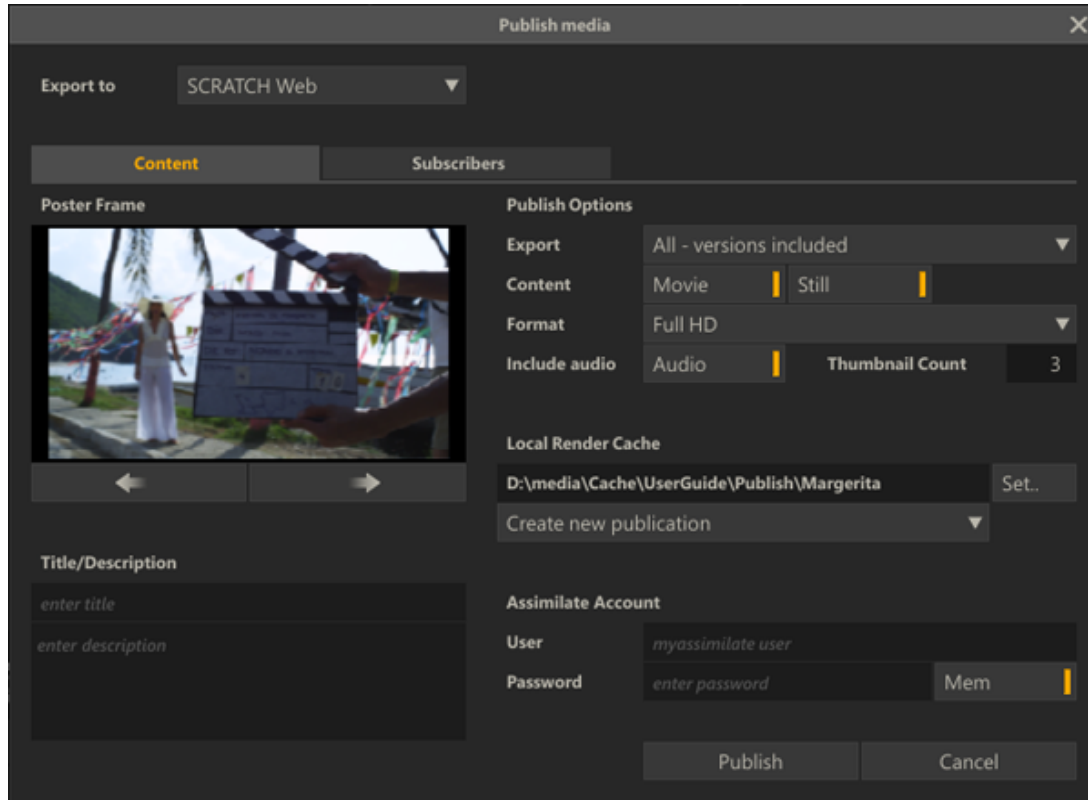
EXPORT TO

Select one of the available targets: SCRATCH Web, YouTube or Vimeo. The available publish options will depend on the selected target.

POSTER FRAME

Set the Poster frame for the publication. Use the arrow buttons below the image to scrub through all shots on the timeline to select the shot to take the poster from.

TITLE AND DESCRIPTION

Below the Poster frame you enter the title and a short synopsis for the publication. How this is used and displayed, depends on the targeted platform.

PUBLISH OPTIONS

Export (SCRATCH Web only)

Sets what you want to publish from the current CONstruct: Timeline as separate shots, including versions of the timeline as a single shot (Output node). For Vimeo or YouTube you can it is always the Timeline as a single shot.

Content (SCRATCH Web only)

- Still images - render one or more full res still images with each published shot

- Movies - render movie per shot

By default SCRATCH will render a proxy image per shot. You can publish a CONstruct with only proxy images. This will render and publish relatively fast and all meta data of the shots is available in that render. Afterwards you can update a render with stills and movies.

Format

There are a series of predefined formats, suitable for the web. In the current version if SCRATCH is running on Windows all output is rendered in H264 using the new Cinema Craft encoder. On the mac H264 QuickTime movies are rendered. Stills and proxies are rendered as jpg files.

Audio

Include / exclude audio with the rendered movies.

Thumbnails (SCRATCH Web only)

Determines the number of proxies / Stills are rendered per shot. If 1 is chosen the middle frame is rendered. If 2 is chosen the frame at 1/3 from the in-point and 2/3 from the in-poin is chosen. etc.

Category (YouTube only)

After the first publish / login with your publish account a list of predefined categories will be available.

Privacy (Youtube only)

Status to set the availability on YouTube.

Tags (YouTube and Vimeo)

Add tags to your publications to make them searable.

LOCAL RENDER CACHE

Before publishing media SCRATCH will render out the proxy images, movies and possible still images to your local disk first. This might require considerable disk space. In case of publishing to SCRATCH Web this cash folder is also used to update a publication or when loading back any added meta data with the published media into the local project again. When a project has been published before you need to explicitly set whether to update the existing publication or to start a new publication.

ACCOUNT INFO

When publishing to SCRATCH Web you enter you Assimilate account credentials here. Your account requires publish privileges before you can publish. Contact Assimilate Support about acquiring Publish Administration Privileges.

When Publishing to Vimeo or YouTube you will be asked to enter authorization in a later stage of the publish process.

SUBSCRIBERS

When Publishing to SCRATCH Web you can also enter a list of email addresses of those you want to have access to the publications. If the person does not yet have an Assimilate account - one will automatically be created and he will be send an email inviting him to the publication. You save and load the email list for use in other publications. Note that you can always change the access list through the MyASSIMILATE list, as discussed earlier in this chapter.

PROCESS

After starting the publish SCRATCH will start with rendering out the proxy images and still images if required. After that it will create a new entry in the Process Queue that will start rendering out the movies. After it has finished with that - another process queue item is created for uploading the media. For SCRATCH Web it used ftp to upload. For YouTube and Vimeo it uses http.

In case you are updating an existing publication to SCRATCH Web, SCRATCH will automatically download any feedback that was entered in the form of notes and add them to the shots in the CONstruct.

04 - Remote

GENERAL

The remote function has been radically updated since version 8. You can connect multiple SCRATCH systems in one session and there there is next to none network setup required. The main principles of a remote session are:

- You initiate a remote session from within the Player

- To join a remote session from the startup screen by entering a session-id, that is provided by the initiator. You then automatically switch over to the Player

- When you exit the Player you automatically disconnect from the session. When the initiator exits the player the session is automatically closed.

- The session covers a single CONstruct. You can not switch between CONtructs in a session.

- The initiator is by default the moderator in the session - which allows him to make changes to the project. The moderator role can be passed on to other participants by the initiator.

- After a session ends - all changes to the project are stored in the local database of the initiator. No project database is maintained with each of the participants.

START A REMOTE SESSION

To start a remote session click the Remote button in to View Port toolbar.
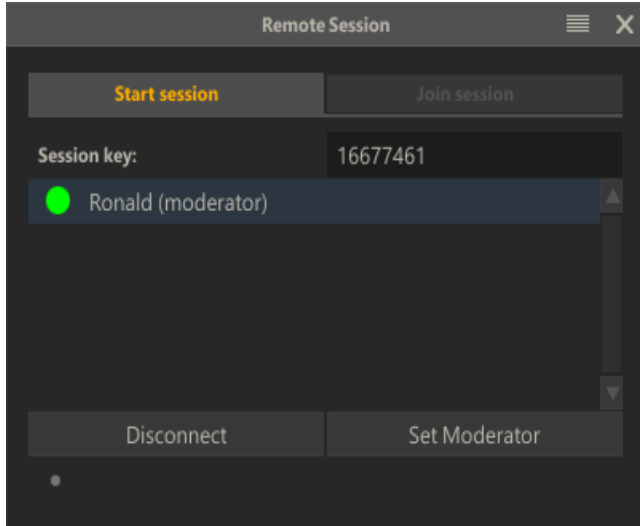
CONNECTION TYPE

Select one of three connection types

- Peer-to-Peer: each participant has a direct connection with each other participant. This is an efficient way of communicating but not all routers except this type of connection and you may have to revert to Server Relay.

- Server Relay: each participant is connected to a central server and all communication between participants goes through that server process.

- Local Network: if all participants are on the same local network (e.g. within a facility or in a closed on-set environment) you should use this type.

SECURE MEDIA

In a remote session not all participants are required to have a copy of the project media. If a participant does not have the media locally it will request a copy of the current frame with the initiator of the session. That frame is stored locally on disk. Enabling the Secure Media option does not cache the media on disk and only holds a cached version in memory, which is cleared after ending the session.

SESSION KEY

When selecting the **Start** button a new session is created, identified by a session key. You pass the session key to all those that you want to participate on the session.

JOIN A REMOTE SESSION
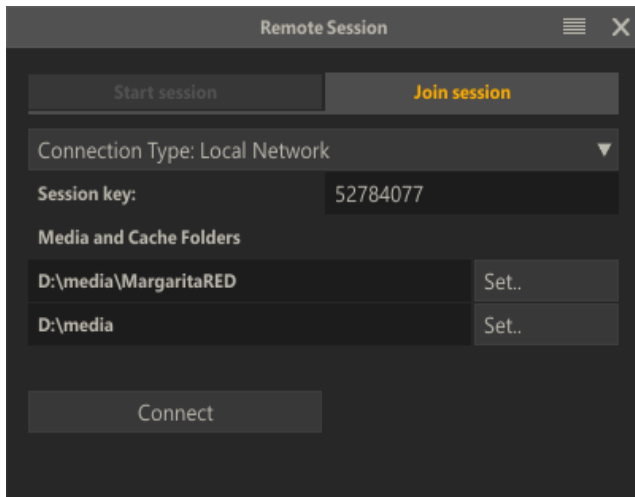
CONNECTION TYPE

When joining an existing session you can only select from one of two connection types: Internet (either being server relay or peer-to-peer but that decision was already made by the initiator) or local network - in which case SCRATCH will scan the local network for the initiator.

SESSION KEY

Enter the session key as provided by the initiator.

MEDIA PATH

A participant may or may not have a local copy of the media at his disposal. In either case a media path and a cache path needs to be set. The media path is where SCRATCH will look for the media used in the project used in the session. In case the participant does not have a copy of the media on his local system, SCRATCH will request the media from the initiator and store it in the cache folder.

If the participant does have a copy of the media on his local system it is important to set the media path to the correct folder. The root media folder should be at the same relative lever as that on the initiator side. When connected you can see if the media path of you and the initiator align by viewing the media details section in the Remote dialog.

Although it is from a performance standpoint most ideal to have a copy of the media on each of the systems of the participants, it is not required. If SCRATCH detects that it does not have the media it will request the current frame from the initiator of the session. The system of the initiator will generate and send a jpeg2000 proxy image to the participant. By default this proxy image is of the highest possible quality but in case of bandwidth limitations you can adjust this with the Remote parameters in the Advanced settings in the system Preferences dialog.

COLOR POINTERS

When connecting to a remote session, each participants is assigned a color. This is used as a highlight color to show a click of a participants on the systems of all other participants.

SCOPE OF THE SESSION

A remote session covers only the current CONstructof the initiator. You can use the full Matrix and Edit toolset. Only the changes that the current moderator makes are passed to all other participants. Note that the timeline position is constantly synchronized between all participants, as is a switch to and from Source mode. The menu views are however not synchronized. That means that if the moderator switches from the Matrix to the Editro the participants will not switch with him but will see any edit changes he makes.

05 - User Profile and Galleries

GENERAL

The SCRATCH galleries allow you to store grades and composites outside a particular project database so they can be re-used on any project. The Galleries are tied to your local SCRATCH user profile. You can link this profile with your Assimilate account and store all your private galleries with your on-line account. Having them with your on-line account:

- makes them available from any SCRATCH system without having to copy them over manually on e.g. a USB stick.

- allows you to share gallery items with other SCRATCH users or add shared items to your private gallereis.

- at its most basic, ensures a back-up of your galleries

SELECT AND SYNC PROFILE

The Manage button in the User Profile section of the Startup screen opens the Select and Sync User Profile dialog. From here you can link a local User SCRATCH Profile with an Assimilate account.
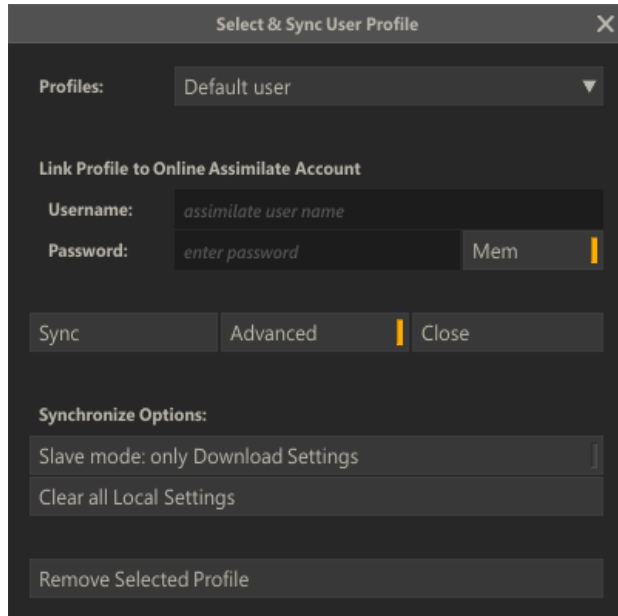
SYNC

The **Sync** button will start synchronize the gallery items present with the local user and what is stored on-line: local items not yet stored on-line are uploaded, items not present locally are downloaded.

The **Advanced** option shows additional options for the synchronization process.

SLAVE MODE

When enabled the Sync process will only download items but not upload any existing / new items.

CLEAR LOCAL SETTINGS

Remove all local gallery items. The on-line version remains untouched.

REMOVE SELECTED PROFILE

Remove the local User Profile and all its settings completely. No effect on the on-line account.

MYASSIMILATE

Once linked and uploaded the galleries are available from in the MyASSIILATE site for sharing and possibly copying shared items into your private galleries. this function was discussed earlier this chapter.

11 - Customization

01 - Playout

GENERAL

The **Playout** menu is the default menu when you enter the Player. The controls on the menu are only available if there is a valid SDI setup. The Playout module enables you to directly control a connected Video Tape Deck (VTR) to play out the currently selected range in the Player, or even an entire CONstruct, to a specified Timecode. Sequences can be output to NTSC, PAL, or any HD format; options include 3:2 pulldown for 24 to NTSC conversions and 24 to 25 fps for PAL conversions.
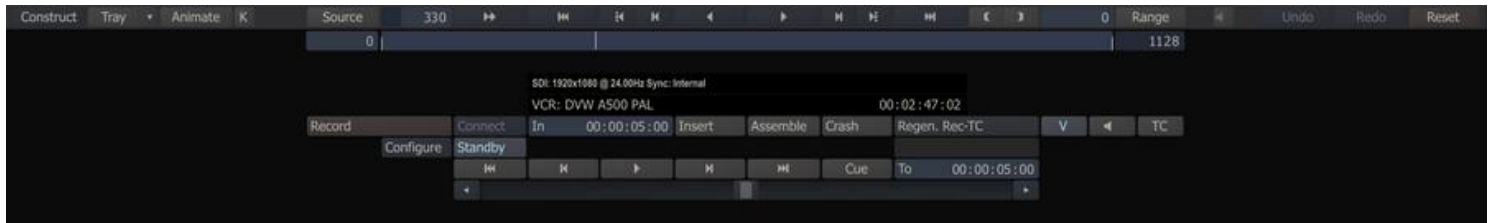
Tip: You can output just a portion of a CONstruct by setting the IN and OUT points to define the range that will be used by **Playout**.

Playout requires an SDI card and the deck control protocol is Sony standard, via an RS-232 connection. An RS-422 to RS-232 converter is required when connecting the serial port from the SCRATCH system to the remote input of the VTR. The details of setting up a valid VTR connection are discussed first and the the Playout menu is covered next.

VTR SETUP

There are two connections that must be made between the SCRATCH system and the VTR. First, the video output from the SDI card's OUTPUT is connected to the VTR's SDI INPUT. This is done through a standard video BNC-connector cable.

Second, the connection is the control link that allows SCRATCH to communicate with the VTR. This connection is made from a serial port (Windows) / device (OS X) of the SCRATCH system to the REMOTE IN port of the VTR. The serial port uses a communication protocol, called RS-232, while the VTR uses a protocol called RS-422. In order for this connection to be made properly, the RS-232 signal, coming from the SCRATCH system, must be converted to an RS-422 signal the VTR will understand. This is done using an RS-232 to RS-422 converter.

Tip: Alternatively to using the computer's (physical) serial port you can use an USB to RS-422 converter, which creates additional (virtual) serial ports.

Once the physical connections have been made you configure SCRATCH through the VCR Configuration dialog. Click the **Configure** button in the Playout menu to open this dialog.

First thing to set is the Com port SCRATCH should use.

Note: To determine the name of the device to use on OS X, you open a terminal and type the command ls -l /dev/cu* This will list all available devices among which the device you use to set the "port" setting for communication with the vcr.

SCRATCH can maintain settings for multiple decks if connected to different serial ports. Once connected SCRATCH will show the name of the deck - if SCRATCH does not recognize the deck you can update the name.

ADJUSTING FRAME-ACCURACY

For frame-accuracy you can adjust the values for video, GFX and audio to adjust the offset for playback of the deck, and playback of the CONstruct, respectively. By adjusting these values, you can ensure the record IN point on the record deck is at the correct frame (controlled by video), audio sample (controlled by audio) and the correct source frame from SCRATCH is being recorded to the proper Timecode (controlled by gfx).

To test frame-accuracy, use material that is easy for distinguishing unique frames, a countdown, or burned-in timecode, for example and lip sync audio with on regular interval repeating sounds. Do a test layoff to tape and then review the tape.

If the edit point is incorrect, adjust the video value, save the file and re-try the layoff. Once the edit point is correct, evaluate if the correct source frame is being recorded at the first frame of the edit. If this is incorrect, adjust the gfx value, save the file and re-try the layoff. Next try adjusting the audio value to sync with the video. By repeating this procedure, you are able to walk in the frame accuracy for that particular deck type.

The Timecode Generator parameters are only used for a PLAYOUT-Assemble to adjust the timing of communications of timecode changes to the VTR.

Tip: Only adjust one parameter at a time. Adjust the video until it is correct and then move on to the gfx and audio respectively.

TROUBLESHOOTING DECK CONTROL

If you are unable to establish deck control, there are several areas to check. First, check any physical connections to ensure all cables are securely connected to the proper ports / device. Ensure you are using valid (COM) cables for the connections. A standard 9 pin connector, like those used for deck control, can be wired many different ways. Your cables should follow the standard RS-232/RS-422 pin out.

Check that the deck has been properly configured for remote control. Consult the user manual for your particular deck, and more information.

Check that the PConfig.xml file has been edited properly. Revert to a backup copy, and start over if necessary.

If you are using an RS-232 to RS-422 converter that draws power from the COM port, you need to switch the value of the drsrts from 0 to 1 in the initial vcr configuration line.

If you are still experiencing problems with controlling a deck, contact ASSIMILATE Technical Support.

VTR CONTROL

SDI AND VCR

The text above the **Playout** controls shows the SDI output signal and the type of VTR currently connected. If a four-digit value is shown, then the current deck has not been fully configured.

TIMECODE DISPLAY

The timecode displayed above the **Playout** controls shows the current timecode being read from the connected VTR.

CONNECT

The **Connect** button is used to establish communications with the VTR. Pressing the Connect button sends standard connection information through the serial control cable and awaits a proper response from the deck. If no response is received, the PLAYOUT controls are not activated.

RECORD

The **Record** button starts the record to tape. The deck is pre-rolled, and then a record is executed. The state of the Insert and Assemble buttons determines what type of recording is performed.

IN

The In Numerical Slate determines the starting timecode for the record operation. This timecode is relative to the starting timecode of the CONstruct. For example, if the CONstruct's record timecode, set in the CONstruct Settings menu, is set to 01:00:00:00 and a value of 01:01:00:00 is entered into the In slate for the PLAYOUT, the recording will start at 01:01:00:00 on the tape, with the frame at 01:01:00:00 in the CONstruct. You do not have to set a separate In point for the CONstruct and the VTR. They are assumed to always be identical.

INSERT

When **Insert** is activated, Playout performs an INSERT EDIT to the VTR. Insert edits are frame accurate edits that begin and end with clean edits. This means timecode and control track are not broken as part of the edit. This requires the tape to already have valid control track and timecode for the edit to be performed.

ASSEMBLE

When **Assemble** is activated, Playout performs an ASSEMBLE EDIT to the VTR. Assemble edits start with a clean edit, but the end of the edit breaks any control track on the VTR. Assemble edits do not require the entire tape to be pre-striped with control track and timecode. These signals are regenerated by the VTR as part of the record process. However, if the tape does have pre-striped control track, the out point of the ASSEMBLE EDIT breaks the continuity of this control track.

Note: Be sure your VTR is set up correctly to regenerate proper timecode for the format you are recording onto.

Tip: You can de-activate both INSERT and ASSEMBLE to preview the edit without actually performing a RECORD operation to the tape.

CRASH

Enabling this option will disables cueing the VCR to a specific point and instead starts recording right after obtaining a servo-lock.

REGENERATE TC

When Assemble is set, you can select the timecode that is to be send to the VCR. Either the CONstruct / timeline timecode (Rec-TC) is send or the source timecodes of the individual shots (TC) is passed along.

AUDIO

When Audio is available and enabled in the Player, you can activate the audio channel on the VCR.

TRANSPORT CONTROLS

|◄◄| Rewind the VTR towards the beginning of the tape

|◄| Go back 1 frame on the VTR
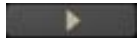
|►| Put the VTR in Play Mode

|►| Go forward 1 frame on the VTR
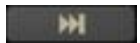
|►►| Fast-Forward the VTR towards the end of the tape

CUE

Cue the VTR to the timecode indicated in the TO Numerical Slate

TO

The TO Numerical Slate allows you to input a timecode for the CUE command. When the **Cue** button is pressed, the deck cues to this timecode value.

EMULATION MODE

In the Configuration dialog you can set the Playout to Emulate-mode. This mode makes Playout available but without the VCR control. When pressing Record in Emulate-mode, a normal Playout run is performed but without actually activating the VCR. This mode can be used for testing, reviews or e.g. audio sync on SDI. Note that also clicking the **Connect** button while holding down the Quick key: Ctrl will switch the PLAYOUT module in **Emulate-mode**.

SDI ANCILLARY DATA (ANC)

SCRATCH uses the NVIDIA drivers to embed Ancillary metadata (ANC) in the SDI signal. This option is enabled by default. To switch it off you need to set the SConfig variable AS_ENABLE_SDI_ANC=FALSE. There are four ancillary data tracks available for adding timecode data - VIDC, LTC, Film Timecode and Production Timecode. By default SCRATCH embeds the timeline timecode to VIDC, the shot timecode to LTC and replicates both timecode in the Film- and Production tracks. You can change which timecode is assigned to which track by switching the Regenerate option on the Playout menu panel from Rec-TC to TC.

SDI EMBEDDED AUDIO

An NVIDIA SDI card with firmware 3.09 or higher supports embedding audio in the SDI signal. As was discussed in Chapter 5 - The Player, you have a separate set of audio settings for Playout. Selecting the SDI Embedded device will include the audio played in the SDI signal available for recording by the VTR.

02 - Control Surfaces

GENERAL

The external control surfaces are a great way to increase the speed of color grading in SCRATCH. There current supported panels are: Tangent Devices (CP200, Wave and Elements) and AVID Euphonix (MC Color).

Note: Both the Tangent Elements and AVID Euphonix require you to install their own driver and communication layer application software that comes with the panel.

PHYSICAL CONNECTIONS

USB/SERIAL INTERFACE

To Connect the Tangent Wave using the USB/Serial interface, simply power on the device and connect the USB cable to an available USB port on the SCRATCH system. Once connected, the device installs itself automatically, including (if needed) a Virtual COM port (VCP) driver to connect to the JL Cooper device. From here you can proceed to the section on CONFIGURING THE CONTROL SURFACES. If, after following the steps to configure the control surface, you still are not able to establish communication with the device, see the section about TROUBLESHOOTING CONTROL SURFACE PROBLEMS for more details, later in this chapter.

ETHERNET INTERFACE

In an Ethernet configuration, each control surface is assigned an IP address on the network. This IP address identifies the control surface on the network, so that SCRATCH can communicate with it. In most cases, this really just means the control surfaces and computer must have the same first three numbers in the IP address. For example, 192.168.10.xxx. This will be covered in detail in the section about CONFIGURING THE CONTROL SURFACES later in this chapter.

The control surfaces need to be on the same physical network as the system but can also be connected directly to the system in a stand-alone setup or if there is a second network adapter available in the SCRATCH system. It's recommended that you keep the control surfaces as close to the computer on the network as possible. Meaning, there are a minimal number of network switches or other network appliances in between them. If necessary, consult a network administrator or IT manager for proper network setup between the SCRATCH computer and the Ethernet control surfaces.

If the network has a DHCP server that assigns IP addresses, it is possible to just use this to assign the IP address to the control surfaces. If however, there is no DHCP server, or if you are connecting the control surfaces directly to the computer and there is no other networking connection needed, assigning the IP addresses manually is recommended.

CONFIGURING THE CONTROL SURFACES

Using the Panels Advanced Settings dialog you can initialize and configure one or more panels and instantiate a set of control mappings.
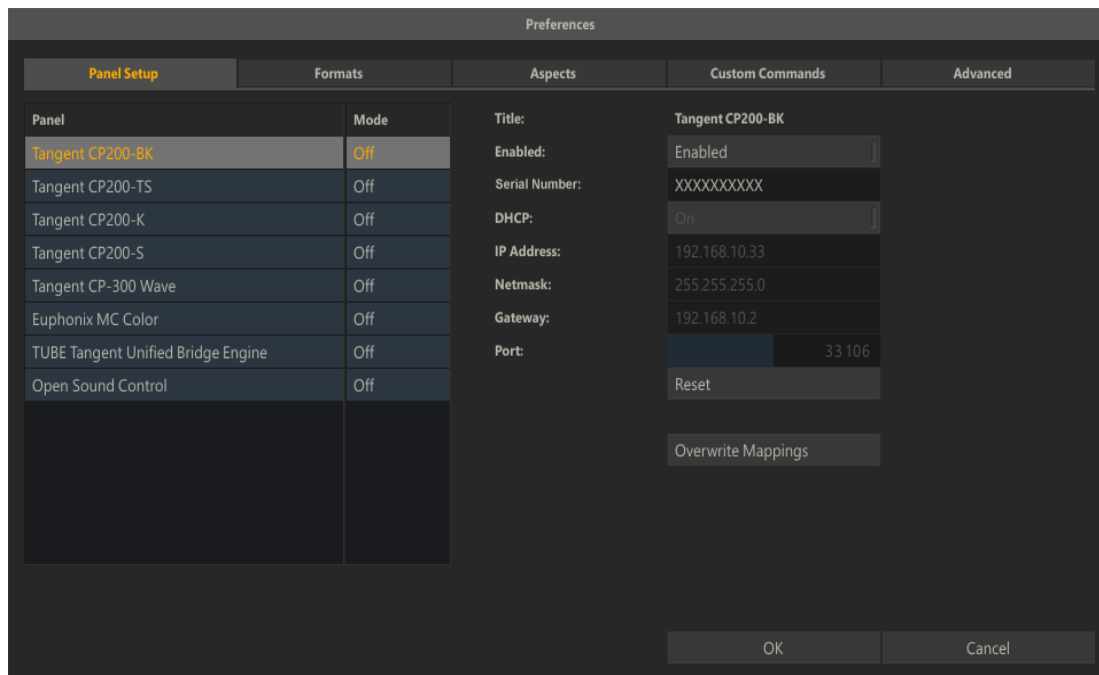
In the left part you select the panel to configure. The right side of the dialog shows besides a number of common functions the set of configuration parameters that differ per panel type.

COMMON FUNCTIONS

Enable
Toggle to enable / disable a panel

Reset
Reset all configuration values to their default values

Overwrite Mappings
When you enable a panel the first time - a set of default control mappings is activated which you can customize once inside the Player. When you enable another panel these mappings are not overwritten by default but require you to explicit click the Overwrite button.

CUSTOM CONFIGURATION

Tangent Devices Panels
For Tangent Devices, you need to provide the **Serial Number** ID for each panel. The serial number ID is shown on the panel's display when it is powered on. Every panel has its own unique ID which needs to be set for every panel that you enable. The remaining sections of the configuration describe the IP address and other network information for the panel. If you are using DHCP you only need to enable that setting - though you need to set it for every panel that you enable. Alternatively you need to set up the IP address, Netmask, Gateway and port manually.

In case you set the IP manually and if the computer and panel are the only things on the network, it's recommended to leave the IP addresses at their default values. If the Tangent panels will be on a network with other computers, you need to get the proper IP address, gateway and netmask information from your network administrator.

Tangent Wave, Elements and Euphonix
No additional configuration settings are required.

CUSTOMIZING THE CONTROL SURFACE IN SCRATCH

THE CONTROL SURFACE CONFIGURATION INTERFACE
Once SCRATCH is running, the Control Surface Configuration Interface is available from inside the Player under the Settings Menu. Clicking on the Panel Settings button opens the Configuration Interface. The interface has four main sections: Groups List, Mapping Pairs List, Encoders/Knob- SCRATCH Controls List and Group Text Labels.
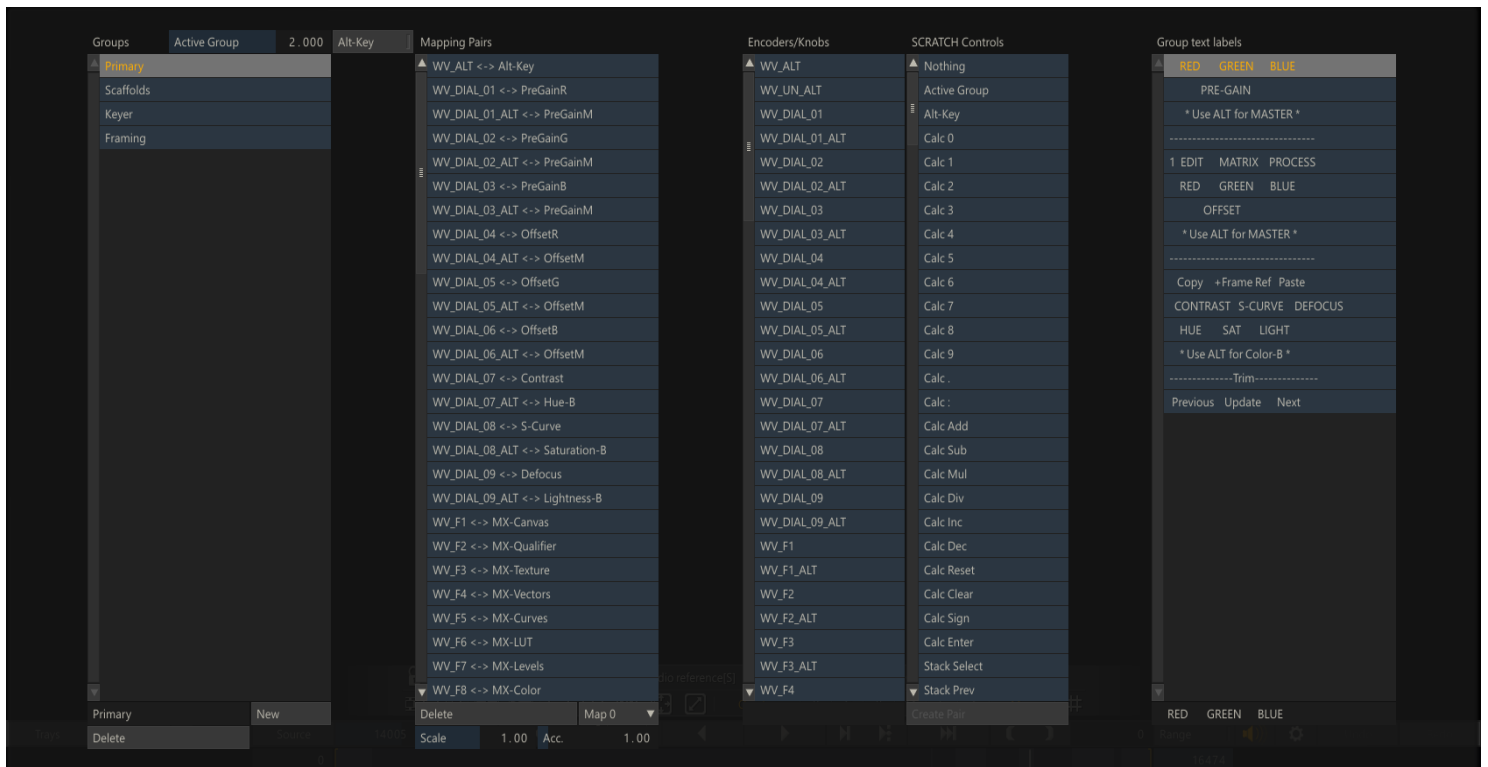
Note: All SCRATCH controls are active while editing the Control Surface Configuration! Moving a control on the panel adjusts the parameter to which it is assigned. Because of this, it is recommended that any adjustments to the panel mappings be made on a non-vital CONstruct; this avoids any negative affect to critical work that has been done as part of an active job.

UNDERSTANDING GROUPS, PAIRINGS, AND MAPPINGS

The basic building block of panel mapping is the Mapping Pair. This is a link between a control on the panels and a function within SCRATCH. The value of the SCRATCH function will be modified when the panel control is changed, based on values that are set up as part of the Mapping Pair.

There are a limited number of controls on the panel, and many functions that can be controlled within SCRATCH. You can create multiple Groups of controls that allow you to re-assign some or all of the controls on the panels.

A good analogy is to think of Groups as transparency overlays on the panels.

For example, think of a printed image. Now, picture several sheets of transparent plastic laid over the image. Each piece of transparent plastic can have a new image on it, which will obscure part of the image below. However, where there is nothing on the transparent plastic, you can see through to the image below.

The concept is the same for panel mapping. Each new group of Mapping Pairs overlays on top of the group below it. The order of the groups can be seen in the Group list on the left side of the Configuration Interface. At the top of the list is the Default Settings. This is the base group where most controls are assigned. This is the equivalent of the printed image in the picture analogy. Each additional group can have new functions assigned to a panel control, which will 'cover up' the function assigned to that same control in a lower group.

In this way, you can create groups of panel mappings which expose certain functionality within SCRATCH based on the task you are doing.

For example, a Group called PRIMARY can be dedicated to primary color grading. All of the functions that are mapped to the panel will be for controls such as Lift, Gamma and Gain, Offset, Pre-Gain etc. Then, you can create a new Group called PAN-SCAN, which re-assigns some of the controls to functions such as Image Scale, Offset and Rotation. You can also create another Group called SECONDARY, which dedicates controls on the panel to tasks that are specific to secondary color grading, such as Scaffold selection and positioning, Qualifier color selection, and so on.

Now, when you want to work on primary grading, you switch to the PRIMARY group and you have all the tools for primary grading available. When it's time to do secondary work, switch to the SECONDARY group, and now the panel controls are specialized for secondary color work.

This is just one example of how Groups can be used. The method is completely flexible and can be configured to your specific way of working. The important point to remember is that any panel control not assigned a specific function in a Group, will keep the function from a lower group.

CHANGING THE ACTIVE GROUP

Each group is numbered, starting at zero, to identify it. The group's position in the Group List determines its number. You can see the currently Active Group number in the Numerical Slate above the Group List. The Active Group is a parameter that can be mapped to a panel control. If you are going to use multiple groups, you must have at least one control mapped to the Active Group function, so that you can easily switch between Groups.

For example, in the default panel mapping for the Tangent panels, the F1 and F2 buttons on the Tangent CP200-BK are mapped to the Active Group. The F1 button increases the Active Group number by one each time it is pressed, and the F2 button decreases the Active Group number by one each time it is pressed. This allows you to easily move forward and backward between Groups, without continuously pressing one button to go all the way through the Group List and loop around.

Note: On the JL Cooper panel, the Page 4 button is mapped to decrease the Active Group, and the Page 8 button is mapped to increase the Active Group.

CREATING A NEW GROUP

To create a new Group, click the **NEW** button at the bottom of the Groups List. This will create a Group called New Group at the bottom of the Groups List. You can rename the Group by clicking in the Text Slate at the bottom of the Groups List, and typing in a new name.

Tip: Be sure to press Enter on the keyboard to accept the new name.

You can remove an existing Group by selecting it from the list, and then press the **DELETE** button at the bottom of the Groups List.

CREATING NEW MAPPING PAIRS

To add new pairs to this list, select the proper Group in which you want to create the mapping from the list on the left side. With the Group selected, you can select the button or encoder from the Encoders/Knobs list, and then select the SCRATCH control you want to be affected by that button/knob from the SCRATCH Controls list. Press the Create Pair button at the bottom of the Scratch Controls list, and a new Mapping Pair will be created in the Mapping Pairs list.

Tip: SCRATCH automatically selects a panel encoder, knob, or button when it is pressed or moved. This allows you to easily select a panel control without searching through the list. If a Mapping Pair already exists for that panel control in the current Group, the Mapping Pair will also be selected.

MODIFYING AN EXISTING PAIR

Each Mapping Pair has three values associated with it: Scale, Acceleration and Map. These values can be changed at any time by selecting the Mapping Pair and entering a new value.

Scale

The Scale value determines the overall sensitivity of a panel control. Each increment of the panel control is multiplied by the scale, and that is the amount the SCRATCH parameter will change. By increasing the Scale value, you can increase the SCRATCH parameter more quickly, but you lose some ability for fine control. The Scale value can also be set to a negative number. When applied to Knobs or other encoders, it is not necessary to assign a separate positive and negative control. The encoder automatically increases or decreases the value. However, using a negative value reverses the behavior of an encoder so that a counter-clockwise movement will increase the value, rather than decrease it. You can also assign negative Scale values to buttons to decrease a value. An example of this is the Active Group buttons in the Default mapping. One button has a positive Scale, while the other button has a negative Scale. The end result is one button increases the Active Group value, and the other button decreases the Active Group value.

Acceleration

The Acceleration value controls how quickly the SCRATCH parameter changes, depending on how fast the panel control is moved. This is most frequently used for encoder knobs or trackballs so that a quick movement increases the SCRATCH parameter by a large amount, but a slower movement adjusts the parameter by small increments. This allows for very fine control when moving a panel control slowly, but more drastic changes when moving a panel control quickly. You can adjust the Scale and Acceleration values to get the behavior you want from a particular control.

Map

Several SCRATCH controls have multiple channels or Maps. For example, the Lift control has three Maps; one for the horizontal axis of the color wheel, one for the vertical axis of the color wheel, and a third for the master adjustment. Each of these Maps must be assigned to a different panel control. If you look at the default panel mapping under the Default Menu Group, there are three Mapping Pairs associated with the Lift control. They are assigned to Trackball 1's X, Y and Z axes. If you select one of the Mapping Pairs, you will see the associated Map value. Notice that the Map value is different for each axis.

Most SCRATCH parameters have two Maps; Map 0 is the parameter's value and Map 1 is the reset for the parameter. So, creating a Mapping Pair using Map 0 links the panel control to the actual SCRATCH parameter's value, and creates a second Mapping Pair (usually using a button); using Map 1 links that panel control to resetting the SCRATCH parameter.

A complete list of each SCRATCH Control and its associated Maps is at the end of this section.

EDITING THE GROUP TEXT LABELS

The text that appears on each display can be edited to represent the functions currently available. Each Group can have its own text display, which allows you to show the proper information when the Group is selected. When a Group is selected from the Groups List in the Configuration Interface, the associated text appears in the Group Text Labels area on the right side. Each line represents a single display line on a panel.

Note: The order of these lines is determined in the cs_devices.xml file by the <display> and <lines> tags. Details on this are in the notes just above these tags in the cs_devices.xml file.

To edit the text, select the line from the list, click in the Text Slate at the bottom, and enter or edit the text. Press Enter to accept the new text and it will appear immediately on the control surface.

The Text Labels work in the same way as the Groups in that, any line left empty will be 'transparent' to the text from the Group below. When building a custom panel mapping, be sure all text accurately reflects the functions that are active to avoid confusion with users.

USING THE ALT FUNCTION

The ALT function allows a secondary mapping to be made to a panel control. The ALT key works similarly to the ALT key on a computer keyboard; holding down the ALT key changes the functions that are mapped to each encoder or button.

In order to use ALT-Key functions, you must first map one button of the control surface as the ALT key. On Tangent panels, the TS, and S panels have a MORE button that is well-suited for this, but any button can be used.

Note: Each button and encoder on a control surface has a unique ID that is used to identify it to SCRATCH. These encoder IDs are then linked to a more user-friendly name, which is the text that appears in the Encoders/Knobs list.

When the ALT key is mapped to a control surface button, a new encoder ID is displayed in the list in the Configuration Interface. This new encoder represents the ALT-modified version of the control surface button to which you've mapped ALT. Any additional ALT-modified buttons you designate on the control surface will generate a new encoder ID, since they need to be uniquely identified. By default, the name is the encoder ID, but you can change this by selecting the new encoder from the list, and editing the Text Slate at the bottom of the list to change the name for the new encoder. A recommended naming practice is to add ALT to the beginning or end of the name to indicate that it is an ALT-modified encoder.

Once the ALT key has been mapped, you can create Mapping Pairs just as you would normally, except before creating the pair, activate the **Alt-Key** interface button located just to the right of the Active Group Numerical Slate on the left side of the Configuration Interface.

Tip: Be sure to de-activate the Alt-Key button when you are finished creating Alt-Key mappings.

To use the new Alt-Key mapping, hold down the button you assigned as the ALT key, and then use the button or encoder you assigned. When you release the ALT key, the corresponding control reverts back to its normal function.

TROUBLESHOOTING CONTROL SURFACE PROBLEMS

Most problems with the (Ethernet) control surfaces come down to a network configuration problem, where the computer and the control surfaces have not been configured to use IP addresses from the same subnet; or, there is a physical issue between the computer and the control surfaces.

- Be sure the computer's network settings are set up properly, and for the right physical connection. Some systems have two Ethernet ports, and each port can be configured separately.

- Be sure you have the Ethernet connection plugged into the proper port on the computer. If the computer has dual Ethernet ports, you can use one port to connect to the control surfaces, and the other port as a standard Internet connection. They simply need be configured properly in the Network Connections part of the Windows Control Panel.

- To check if there is proper communication between the computer and an individual panel, you can use a DOS command called 'ping'.

- Open a DOS window by clicking on START and selecting Run…

- Type in 'cmd' [without the quotes] and hit ENTER. You'll get a DOS window.

- At the DOS prompt, type 'ping 192.168.10.36' [again, without the quotes], or whatever IP address you set up in the panel configuration.

- You should start getting a response from the panel. If you do not get a response, then there is most likely a problem with the configuration of the IP addresses.

- Also check the physical connections; verify that the cables are proper Ethernet cables; be sure you are using the proper Ethernet port on the computer; and check that the cables are fully inserted into the Ethernet jacks on the computer and control surfaces. It is sometimes necessary to reboot the computer for network changes to take effect. Have the control surfaces connected and powered up when you reboot.

- Finally, be sure you have run SCRATCH at least once. The control surfaces will not be properly configured until SCRATCH is running, and you have at least entered a project and gone into the PLAYER. This passes the configuration information to the control surfaces, where it is held even after SCRATCH is exited.

If you are still experiencing problems with your control surfaces, contact ASSIMILATE Technical Support.

03 - Custom Pull-downs

GENERAL

There are two areas in SCRATCH that use pull-down menus, which can be customized at a global level. They are the Aspect Ratio pull-down and the Image Formats pull-down. These pull-downs can be customized using the Advanced Settings dialog in the System Settings module.

IMAGE FORMATS

You can Add or Remove a format by using the corresponding buttons below the list. use the controls on the right to Edit an (existing) format.
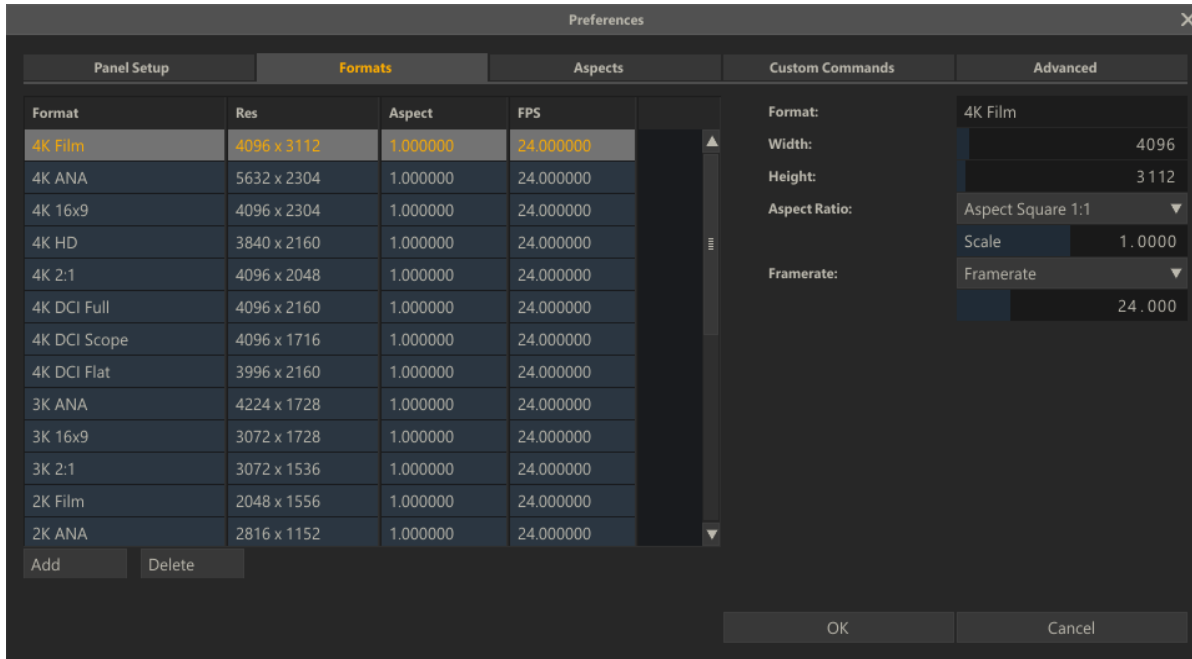
- **Format**: the text used on the pull-down menu within SCRATCH.
- **Width**: the number of horizontal pixels the CONstruct resolution is set to.
- **Height**: the number of vertical pixels the CONstruct resolution is to.
- **Aspect Ratio**: the aspect ratio value used by the CONstruct.
- **Frame Rate**: The Frame Rate is used by the CONstruct. The value is stored with six decimal places.

ASPECT RATIO

The first couple of items in the Aspects Settings are fixed and cannot be changed and ared shown as disabled.
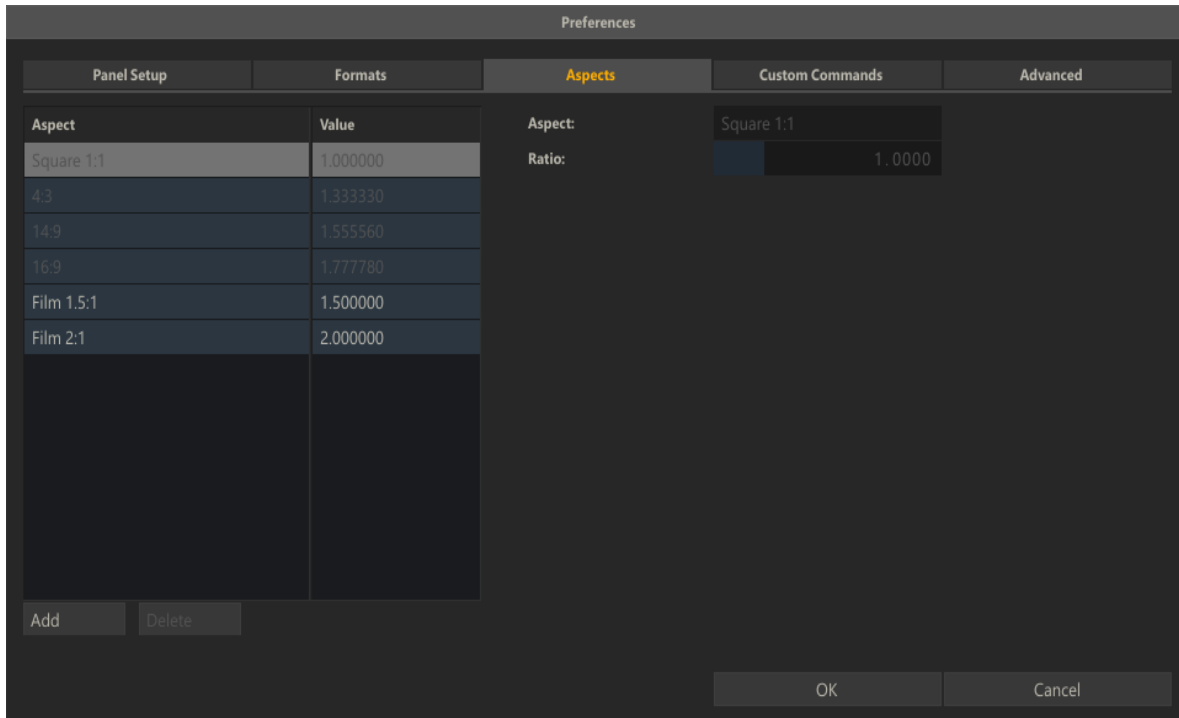
- **Aspect**: the label describing the ratio
- **The actual ratio**: positive values indicate ratios for an image, while negative values indicate pixel ratios.

04 - Custom Commands

GENERAL

In the Preferences dialog in the Custom Commands tab you can define Custom Commands. There are different types of Custom Commands:

- define a button in SCRATCH to start an external script or application or open a web page.

- define a button to initiate a plug-ins.

- define a button to start an XSL Transform.

- define a Post Render command to run an external script or application after a render completes.

- define a plug-in to be used on the second head if defined.

All Custom Command buttons are placed in the Tools menu of the CONstruct and the Settings menu in the Player. Note that there is limited space to show buttons. Custom Commands that are initializing plug-ins for a second monitor are listed in the Dual Head section in the Settings - Monitor menu of the Player.
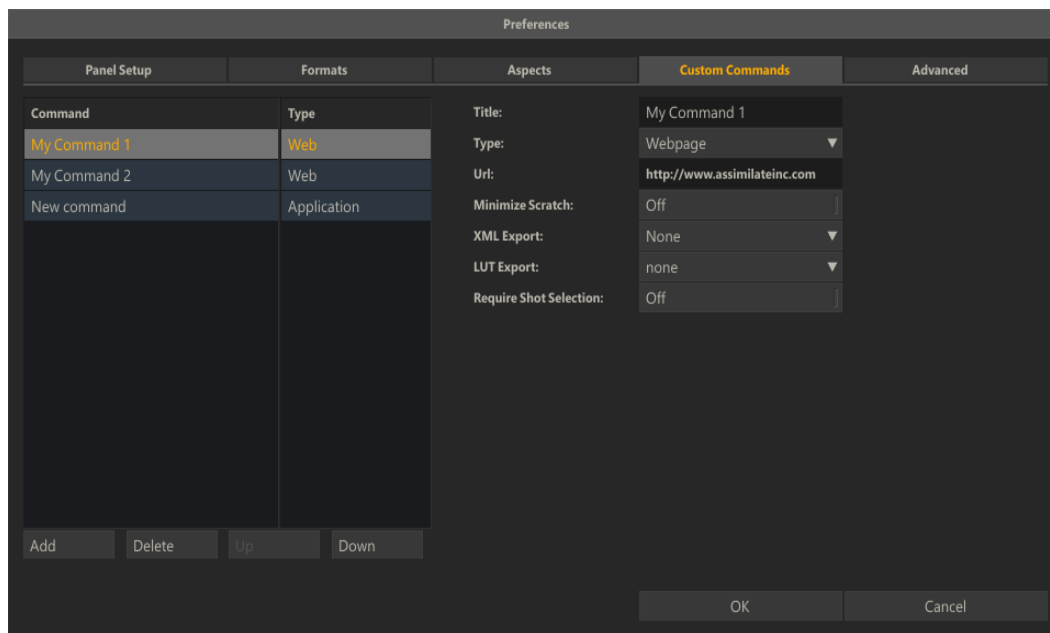
TITLE

The label that is displayed on the command button or in the post-render option list with any output node.

TYPE

Either Application (executable / script), Post render (executable / script), Plug-in, Web page (URL) or XSLT transform.

APPLICATION / SCRIPT

FILE

The Path and filename of the application or script to run.

WAIT TILL FINISHED

If enabled SCRATCH will return control over the User Interface only after the application or script closed again. Note that you should not use this option with scripts of applications that run for a considerable amount of time as it will seem to the user that SCRATCH is unresponsive and hangs.

MINIMIZE SCRATCH

When enabled SCRATCH will minimize itself before running the application or script.

XML EXPORT

Options to write an XML file with information about the selected shots in SCRATCH the moment the user clicks the command button. The XML file is created in the temp folder of the current project-folder; c:\ProgramData\Assimilator\Projects\MyProject\temp\ . The structure of the the XML is shown in detail in Appendix C - Database, XML, XSLT and HTML.

- None - no xml is created.

- Project - the full project xml is written.

- Group - only the current selected group is included.

- CONstruct - only the current selected CONstruct is included.

- Selection - only the current selected shots are included.

LUT EXPORT

Option to store the grade of the shots included in the XML in the form of a LUT: 1D, 3D or XML LUT.

PROXY EXPORT

Option to store a proxy image of the shots included in the XML in a jpeg file.

REQUIRE SHOT SELECTION

If set, the command button will be greyed out if no shot is selected in the CONstruct. This way you can forse a selection before executing a script.

PLUGIN

PLUGIN

Select a specific Plug-in

PRESET

Select a plug-in preset file. Please see Chapter 7 - The Marix for details on saving plug/in preset files.

USE ON DUAL HEAD

Enabling this option will add the entry to the Dual Head Effects list as described in Chapter 5 - The Player, the Monitor Settings paragraph, rather than adding a command button.

ENTER PLAYER

With this option enabled SCRATCH will after creating the plug-in automatically open the node in the Player.

WEBPAGE

URL

The full web address, including the http:// protocol prefix. Rather than creating an xml file with information on the current selection - the URL is extended with the following fields:

```
SCRATCH_WATCH_FOLDER - if set the system watch-folder.
SCRATCH_PROJECT_FOLDER - the project folder of the current project.
SCRATCH_MEDIA_FOLDER - the default media folder of the current project.
SCRATCH_RENDER_FOLDER - the default render folder of the current project.
SCRATCH_EXPORT_FOLDER - if set the auto-export folder for the project.
SCRATCH_PROJECT - the name of the current project.
SCRATCH_GROUP - the name of the current selected group.
SCRATCH_CONSTRUCT - the name of the current selected CONstruct.
```

If a shot is selected:

```
SCRATCH_SLOTNAME - the name of the slot selected shot resides.
SCRATCH_SLOTNR - the index of the slot the selected shot resides.
SCRATCH_SHOT_UUID - the unique identifier of the shot.
SCRATCH_SHOT_FILENAME - the filename (of the first frame) of the shot.
SCRATCH_SHOT_IN - the in-point as set by the user.
SCRATCH_SHOT_OUT - the length of the shot.
SCRATCH_SHOT_CURRENT - the current frame of the selected shot.
```

The fields are added as parameters in this format:

```
http://www.website.com?SCRATCH_PROJECT=projectname&SCRATCH_GROUP=groupname&.......
```

XSL TRANSFORM

FILE

The full path and filename of the XSLT script.

EXPORT TYPE

The extension for the result file of the XSL Transformation.

06 - Advanced Settings

GENERAL

The last tab of the **Advanced Configuration** dialog, that you can open from the System Settings menu in the Startup module of SCRATCH, gives access to a number of specialized settings to modify certain aspects of SCRATCH. In normal circumstances there is no need to modify these settings. Only for specific purposes and on advice of Assimilate support, you should change these settings.
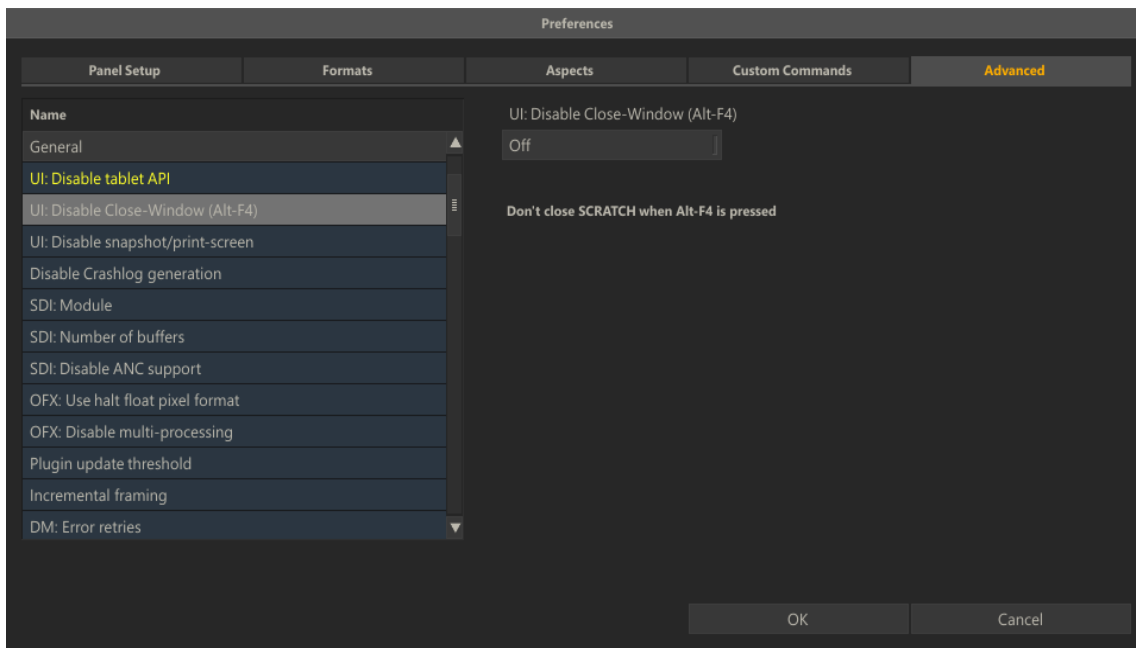
The Settings are grouped in a number of categories: General, Graphics, Media and IO. By default all settings are shown grayed out - meaning that they are on their default value or not being used. When you select a specific setting the right pane of the dialog shows a brief description of the setting, a toggle to tun it ON or OFF and possibly an additional control to set a specific value.

06 - User Interface Customization

GENERAL

The User Interface within SCRATCH lets you deal with the most on a daily basis. So, creating a working environment tuned to your needs not only makes you more productive, but also makes the SCRATCH software feel like part of your facility.

STARTUP LOGO

Use the Startup log setting in the System Settings menu of the Startup screen to show your own logo in the SCRATCH startup screen and as the output for the Dual Head or SDI monitor, if available, whenever you are in the Start-up Screen or CONstruct.

INTERFACE FONT AND COLOR

The color of each element in the SCRATCH User Interface can be modified, as well as the font used throughout the interface. These modifications are saved for each individual User.

To modify the User Interface, you must first enter a Project in SCRATCH. From either the CONstruct or Player, press the Quick Key: Control + U to open the Interface Settings window.
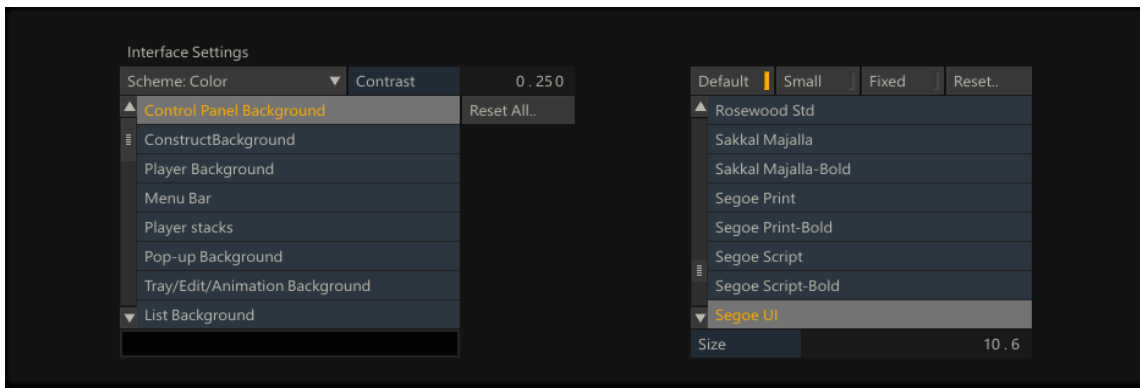
The overall SCHEME is listed on the pull-down in the upper-left corner.

There are three options: Color, Mono and Custom. Color and Mono are preset schemes, but the Custom option allows you to modify every aspect of the interface.

Note: You are only able to modify the interface if Custom is selected.

There is also an overall CONTRAST adjustment, which adds more or less contrast to the overall scheme; the lower the number, the lower the overall contrast of the interface.

The list on the left side contains all the different User Interface elements. To modify an element, select it from the list, and then click on the Color Chip at the bottom of the list.

This opens the Color Selection Palette, where you can choose the new color. Changes you make to the interface are applied immediately, while working in the Color Selection Palette. So, you can gauge what the change looks like, and continue to make modifications. Once you are happy with the color, click OK, or swipe off the screen. If you want to return back to the previous value, click CANCEL.

To reset all elements back to their default color, click on the RESET ALL button.

On the right side, you can choose a font to use for the interface. The buttons across the top allow you to select a separate font for the DEFAULT, SMALL and FIXED representations. SMALL is the text that appears on thumbnails in the CONstruct; FIXED is the text that appears in Numerical Timecode Fields; and DEFAULT is the text that appears everywhere else. Each can be reset using the RESET button on the right side.

Choose a type, and then choose a font from the list. You can also change the overall size of the font using the Size Numerical Slate at the bottom of the list. The changes occur immediately.

07 - Wacom Tablet

GENERAL

SCRATCH is designed to be used with a pen and tablet as easily as with a mouse. In fact, there are several aspects of the interface that make SCRATCH exceptionally comfortable when using a pen.

For example, buttons and controls are large, reducing the amount of precision that must be used to click on a particular control. Also, pull-down menus will remain open with just a single click, and then the pressure on the pen can be released. By keeping the menu open after a single click and release, SCRATCH reduces the amount of strain on your hand and minimizes the fatigue of operating the software over long periods of time.

Having on-screen numerical entry also reduces the amount of back and forth between the pen and keyboard, making for faster overall operation.

First, install the tablet according to the manufacturer's instructions. The tablet should function normally within Windows before configuring for SCRATCH.

For a Wacom tablet to function with SCRATCH, there are two main areas that must be addressed: re-mapping the tablet area, and modifying the pen button mapping.

RE-MAPPING THE TABLET AREA

The tablet area must be re-mapped so that only a portion of the tablet is mapped to the entire screen. This creates a zone around the edge of the tablet that allows the swipe function to be detected by SCRATCH.

Open the Wacom Tablet Properties from the Windows Control Panel.
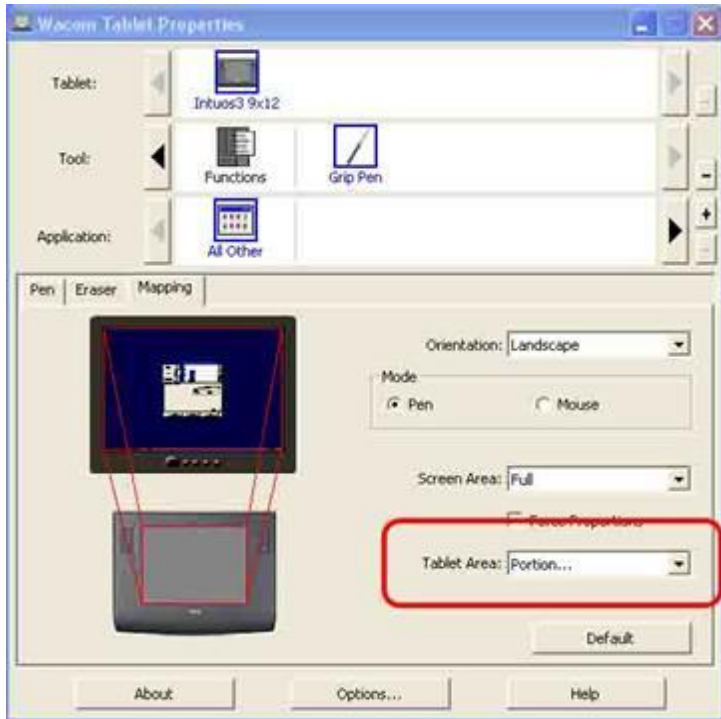
Change the Tablet Area pulldown to Portion. This opens a new dialog where you can assign the portion of the tablet that will be mapped to the entire display area.\

Adjust the red outline so that it is slightly inside the tablet area. You can also do this numerically using the text boxes in the Enter Coordinates area; or, use the Select Area Tool to interactively click on the tablet to define the corners. Any of these methods is acceptable.

Once you have set the portion to your satisfaction, click OK to close the dialog.

MODIFYING PEN BUTTON MAPPING

Depending on your tablet type, the pen button may need to be re-mapped. On Wacom Graphire-series tablets, the normal right-click function on the pen works with SCRATCH.

However, on Intuos-series tablets, the pen button needs to be re-mapped to a keyboard shortcut in order for it to function properly with SCRATCH.

To set up this keystroke, begin by creating a separate mapping for the SCRATCH application. This is necessary so that the right-click function behaves properly in Windows and other applications, but also to be customized specifically for use with SCRATCH.

Click on the plus sign at the right of the APPLICATION area in the Wacom control panel.
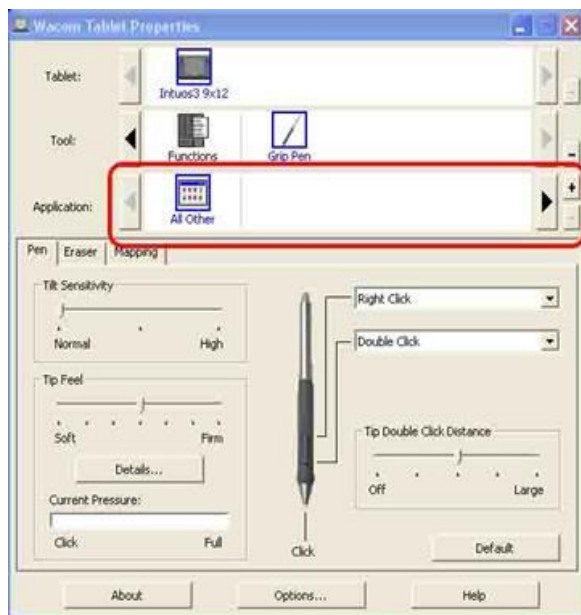
This opens a dialog box where you can select the application to be associated with the new pen mapping. Use the Browse button, and navigate to the SCRATCH executable, located by default at C:\Program Files\Assimilate\bin\Assimilator.exe .

Alternately, you can have SCRATCH running in the background, and it will appear in the list of Currently Open Applications.
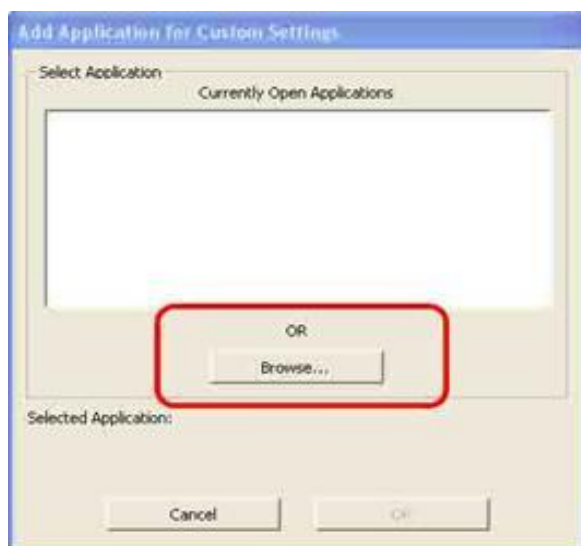
Now you have a new entry in the Applications section of the Wacom control panel.

By selecting the Assimilator icon, you can set Wacom properties that will only be used with that application.
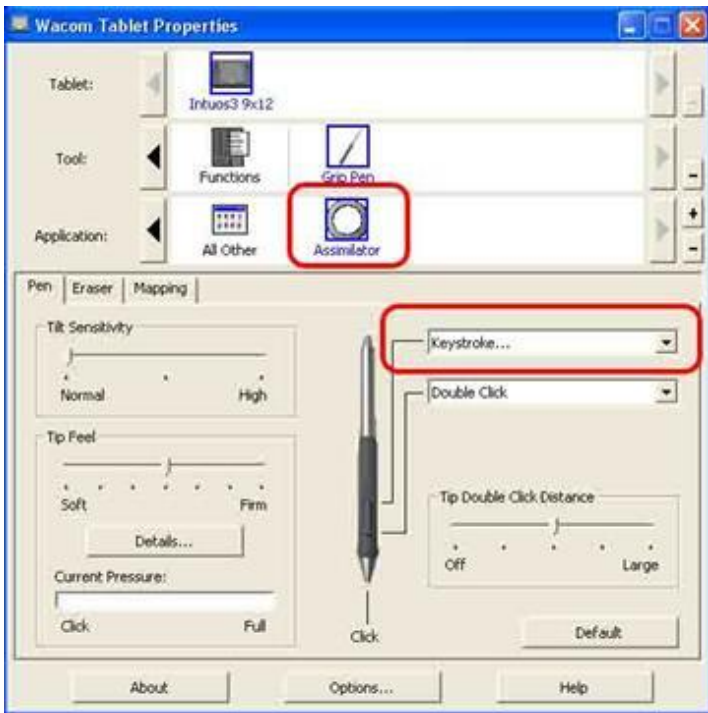
With the Assimilator icon selected, you will want to re-map one of the pen buttons as a keystroke.

The keyboard shortcut, which is the equivalent of a right-click in SCRATCH, is the back-quote or grave accent. It looks like this: ` and is usually found in the upper-left corner of US keyboards on the same key as the tilde (~).

Type the back-quote character into the Define Keystroke window, and click OK.

Once this keystroke is mapped to a pen button, you are able to call up any right-click menus within SCRATCH. The pen button only uses this keystroke when inside the SCRATCH application. For other programs and normal Windows operations, the regular right-click function will be used.

08 - LUT, ACES and CTL support

GENERAL

SCRATCH supports various 1D and 3D LUT formats and LUT options as well as CTL script. When ever you load a LUT or CTL SCRATCH maintains a link to that file rather than storing the content of the LUT / CTL in the project database. Note that:

- SCRATCH identifies a LUT/CTL by its filename. If you load two LUT/CTL with the same name but from different locations - SCRATCH will re-use the first loaded version on both occasions.

- If, when loading a project, SCRATCH can not find a LUT/CTL in its original location it will search for that file in successively the media-folder, project-folder and the user-folder.

- If the LUT/CTL is not found, the Event Log will report the missing file.

SUPPORTED LUT FORMATS

1D LUT FORMAT

While SCRATCH can read several LUT formats / options, the recommended layout for a 1D LUT is as follows:

```
#
# SCRATCH ( nnn ) generated 1D LUT.
# This is an approximation to the color-transform and/or LUT.
#
# Convert 10-bit log to 10-bit linear.
#


LUT: 3 1024


1
2
3
...
1023
0
1
2
3
...
1023
0
1
2
3
...
1023
```

The first lines starting with a '#' code are header lines containing any kind of comments and are not actively processed by SCRATCH. The line starting with *LUT:* specifies the number of channels and LUT size. The following lines are the values for each sample in the first channel, followed by the values for each sample in the next channel and so on. For a typical 1D LUT, three sets of numbers are used representing the Red, Green and Blue channels respectively.

3D LUT FORMAT

SCRATCH supports a range of industry standard LUT formats:

- .3dl - SCRATCH generic format

- .cube - Adobe including DOMAIN MIN / MAX header options.

- .csp - Cinespace including 1D normalization

- .a3d, .m3d - Pandora proprietary format with channel definition in header.

- .s3d - Discrete proprietary format, including 3DMESH in the header

The SCRATCH generic 3D LUT file follows a similar format to the 1D LUT in that there is a header which specifies information about the file followed by the LUT values.

```
#
# SCRATCH v5.1 (617) generated 3D LUT.
# This is an approximation to the color-transform and/or 3D LUT
# Dimension 32x32x32 (10 bits)
# First line specified the sample spacing
# lutname My Company LUT

0 33 66 99 132 165 198 231 264 297 330 363 396 429 462 495 528 561 594 627 660 693 726 759 792 825
858 891 924 957 990 1023
0 0 0
0 0 37
0 0 74
0 0 110
0 0 146
0 0 182
0 0 217
0 0 253
0 35 0
0 35 37
0 35 74
0 35 110
0 35 146
0 35 182
0 35 217
0 35 253
0 72 0
0 72 37
0 72 74
0 72 110
0 72 146
0 72 182
0 72 217
0 72 253
```

In the example above, the comment indicates that the LUT is a 32x32x32 cube and each of the 32 values is then listed on the following line; this does not have to be a linear sequence. Each line after that represents the values for the LUT. A 3D LUT has three values for each line. Each line of the file represents a 'slice' of the 3D cube that defines the boundaries of the LUT. The three values represent the individual color channel values at each point, or node, within this cube.

ACES AND CTL

SCRATCH fully supports the Academy Color Encoding System (ACES) standard as defined by the Academy of Motion Picture Arts and Sciences (A.M.P.A.S.) as well as supports the Color Transition Language (CTL). The current supported ACES version is 0.7.0 and the CTL script interpreter is at version 1.5. Both at the latest version available.

The RRT and various standard ODT (color space conversions) are included as separate ctl files with a SCRATCH installation. By default SCRATCH uses the scripts in the programFiles\Assimilator\Settngs\ACES folder on Windows or library/applicationSupport/Assimilator/default folder on OS X. Those folders also have a series of sub-folders with older versions of ACES transforms.

To use a different version add an ACES folder in the programData\Assimilator\Settings folder on Windows or library/applicationSupport/Assimilator/Settings on OS X and add your own scripts there - making sure to use the same filenames for the various transforms.

09 - Command Line Parameters and Utilities

COMMAND-LINE PARAMETERS

You can start SCRATCH with several command-line parameters to change how SCRATCH is run. Though these command-line parameters are primarily for technical troubleshooting there are a couple that are useful to know. First is the –dd parameter. This parameter runs SCRATCH in debug mode. This simply means more information is written into the Assimilator.log file, and several benchmarking buttons will become available in the Player. The other important command-line parameter is –perf. This parameter adds more information to the Performance Meter that is opened using the Quick Key: F1 in the Player. Individual CPU core performance is displayed, instead of the aggregate display that is used by default. This can be valuable for evaluating CPU load and performance.

Command-line parameters are added onto the end of the line that runs SCRATCH. For example, to run SCRATCH in debug mode, use a line like this in your batch file:

"C:\Program Files\Assimilate\bin\Assimilator.exe" –dd

Notice that the –dd must be OUTSIDE the double-quotes.

The table below lists all current command-line parameters.

-d or -dd	One or more increases the 'debug' level.
-p#	Setup multiprocessing for '#; cpu's, overriding the default which is the actual nr of physical available cpu's. (Eg: Hyper treaded virtual cpu's are not taken into account)
-a	Configure CPU affinity. (Eg: Do select physical cpu's only) When running on a Hyper-Threading enabled system, this flag will ensure the cpu affinity mask to be configured and assign explicit cup's to use for the default threads.
-no_gamma	Overrides all system gamma adjustments and/or Monitor LUT settings. The graphics adapters gamma LUTs won't be touched.
-perf	Enable the performance counters in the statistics. This shows the cpu usage graphs.
-mono_cursor	Disables the use of colored cursors. This is enabled by default but might be incompatible or slow with some graphic boards. (E.g.: The cursor starts to flicker on swap-buffer)
-no_admin	Allow running without Administrative privileges.
filename	Treated as a clip specification and loaded directly into the player, by-passing project/user selections. Nothing is saved in this mode. (E.g.: Run as Zone-1)

ACOPY

ACOPY is a standalone, command-line utility for copying entire folders from one location to another. ACOPY uses a sequential copy method that ensures edits are optimized for real-time playback. Standard Windows drag-and-drop copying can result in files being copied out of order. As a result of this, the media drives perform additional searches to play back the files in sequential order. This can result in degraded playback performance.

It is recommended that ACOPY, or some other sequential copy program, always be used to transfer media onto the SCRATCH media drives.

RUNNING ACOPY

To run ACOPY, first, open a command prompt by going to the Windows START menu and selecting "Run…"

Type cmd into the command window that appears and press Enter.

This will open a DOS command prompt.

Use the CD command to change to the location of the ACOPY executable. By default, this is C:\Program Files\Assimilate\bin.

Tip: If you don't want to navigate to this folder each time, you can add the default location to the Windows Path variable. This can be accessed through the Environment Variables settings within Windows. See the section ENVIRONMENT VARIABLES in Chapter 4 – CUSTOMIZING SCRATCH for more detail on setting Windows Environment Variables. But, keep in mind this is not a SCRATCH Environment Variable, it is an overall Windows variable that already exists. You just have to add the path onto the existing variable.

Type acopy [source] [destination]

The destination path is optional. If it is not specified, then the current location is used.

Tip: Open two Windows File Explorers and navigate to the location of the source files in one explorer, and the destination location in the other. Then, drag the folders from the address bar in Explorer into the command prompt window; they will be added to the end of the ACOPY command.

ACOPY displays the current source and destination file being copied as it works. At the end of the copy process, a summary is displayed in the DOS shell window.

COMMAND LINE OPTIONS

There are several command line options that you can use with ACOPY. Command line options are specified immediately after the acopy command and before the source and destination paths.

The –r option allows ACOPY to copy all the directories under the specified source. Without this option, ACOPY only copies the files found in the specified source folder; it does not work its way recursively through all sub-directories.

The –s option simulates the copy process, but no actual copy operations are done. This is useful for testing to be sure an ACOPY command will have the intended results, without actually having to execute the command.

The –b## option is used to adjust the buffer size that ACOPY uses. Normally, there is no need to adjust this value, but the option is available, if necessary.

An example ACOPY command line would look like this:

acopy –r "S:\render\scene_01" "T:\SCRATCH_MEDIA\my_project\scene_01"

This command would copy all files and sub-folders (because of the –r option) in S:\render\scene_01 into the destination directory T:\SCRATCH_MEDIA\my_project\scene_01

Note: The actual destination folder must already exist. If you had only specified T:\SCRATCH_MEDIA\my_project as the destination, then all files would have gone into that folder. A new sub-folder would NOT have been created.

GETTING HELP

For a complete list of usage and command line options, type acopy with no options at the DOS prompt. This prints the options into the DOS shell window.

09 - Third Party Plug-ins

GENERAL

SCRATCH supports the OpenFX, or OFX, plug-in architecture. This allows external developers to create customized image manipulation code, which can be used and interacted with directly inside the SCRATCH interface, without passing images out to external applications.

An initial list is provided below with links to individual vendors. For the most recent list of supported OFX plug-ins for SCRATCH, visit the ASSIMILATE website at http://www.assimilateinc.com/plugins.html.

SUPPORTED THIRD-PARTY PLUG-INS

Genarts

http://www.genarts.com/product/monsters/assimilate/features

Saphire

Monsters

Raptors

The Foundry

http://www.thefoundry.co.uk/

Furnace

Keylight

Tinder

Imagica

http://www.imagica.com/

Cinecure

Primatte

PLUG-IN LOCATION

During startup, SCRATCH automatically searches for Plug-in modules in the following locations, and in this order:

1. [Installation]\bin64*.node *.spa

2. [Installation]\plugin64*.node *.spa *.ofx *.ofx.bundle

3. [ProgramData]\plugin64*.node *.spa *.ofx *.ofx.bundle

4. [Environment:'ASSIMILATE_PLUGINS']*.node *.spa *.ofx *.ofx.bundle

5. [ProgramFiles]\Common Files\OFX\Plugins *.ofx *.ofx.bundle

6. [Environment:'OFX_PLUGIN_PATH']*.ofx

For OS X the search paths are

1. /Library/Application Support/Assimilator/Plugins

2. /Library/OFX/Plugins/

3. [Environment:'ASSIMILATE_PLUGINS']*.node *.spa *.ofx *.ofx.bundle

4. [Environment:'OFX_PLUGIN_PATH']*.ofx

Where [Installation] is the root path of the SCRATCH installation (c:\Program Files\Assimilate, by default) and [Environment] is a Windows environment variable. ASSIMILATE_PLUGINS can be set to any path and SCRATCH looks for Third-Party Plug-ins under that path.

OPEN FX DOCUMENTATION

If you are interested in creating your own custom OFX plug-ins, documentation for the OFX SKD is available at the following web site: http://openfx.sourceforge.net/

Appendices

A - Quick Keys

GENERAL

SCRATCH has a large number of Quick Keys to invoke various functions. By using Quick Key: H or Quick Key: Alt + H (Startup screen) the full list of Quick Keys is shown, categorized in separate tabs.
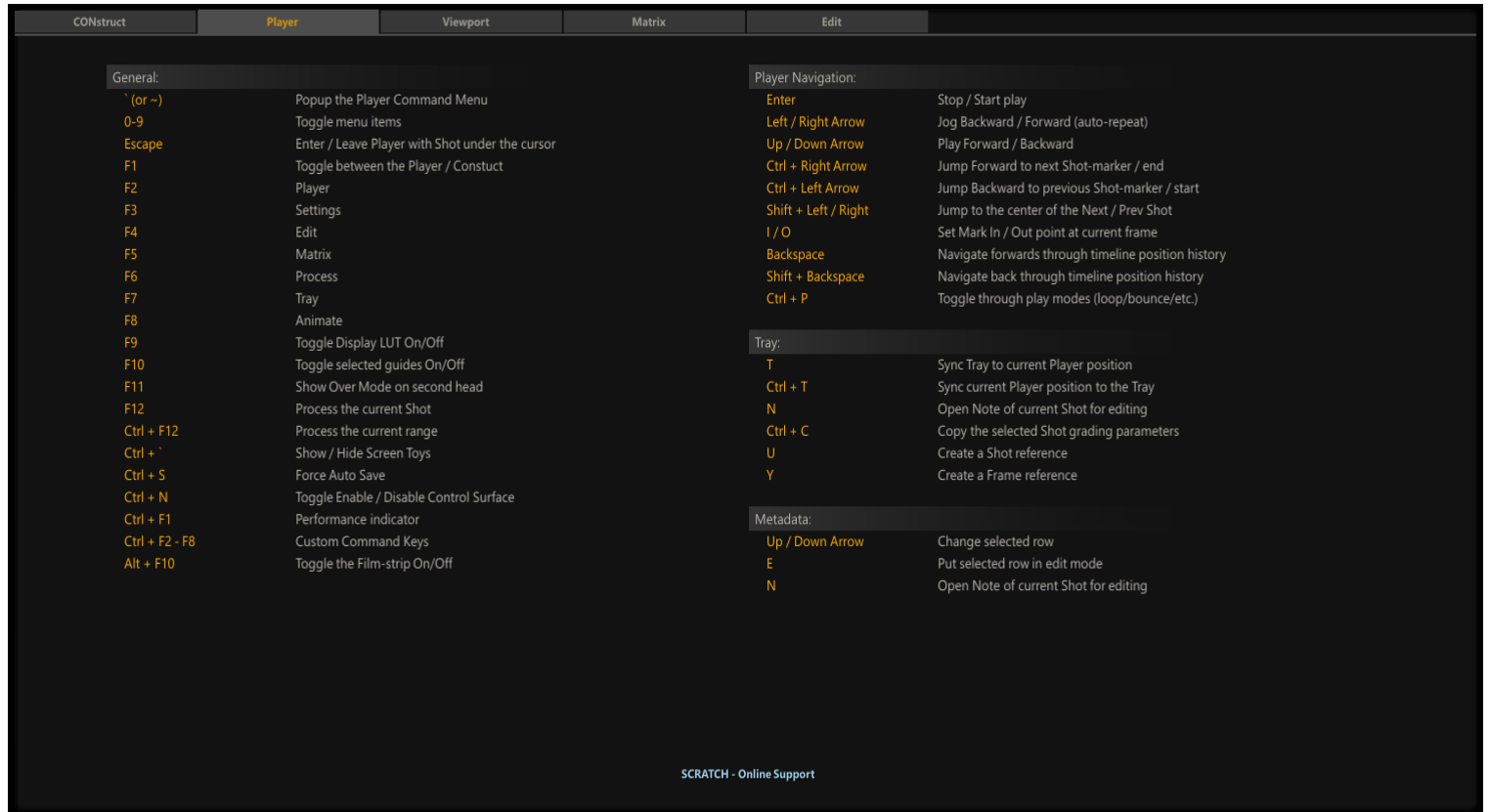
The table below contains the complete list of available Quick Keys.

CONSTRUCT	SWIPES	Left	Show / Hide the construct selection list
		Right	Show / Hide the result(output)-node stack
	NAVIGATION	Escape	Enter / leave player with shot under the cursor
		F1	Toggle between the Player / Construct
		F4	Edit
		F5	Matrix
		F6	Process
	GENERAL	H / Alt + H	Show the active quick keys list
		Q	Show / Hide the project tree
		W	Show / Hide the result(output)-node stack
		Space	Pan across the Construct
		Home	Set all slots to their home position

CONSTRUCT	SWIPES	Left	Show / Hide the construct selection list
		Right Arrow	Step timeline 1 slot to the right
		Left Arrow	Step timeline 1 slot to the left
		I	Popup the shot properties panel
		C	Copy shot under the cursor
		` (or~)	Popup the construct command menu
		(WIN) Alt + F4 **(OS X)** Cmd + Q	Close SCRATCH
		(WIN) Alt + F9 **(OS X)** Cmd + H	Minimize SCRATCH
		Shift	Increase the gearing in numerical controls
		Enter	Close / Confirm any open popup dialog
		(WIN) Ctrl + Z **(OS X)** Cmd + Z	Undo action
		(WIN) Ctrl + Y **(OS X)** Shift + Cmd + Z	Redo action
		Ctrl + A	Select all shots
		Ctrl + D	De-select all shots
		Ctrl + E	Open error dialog
		Ctrl + F	Show shots search dialog
		Ctrl + 1-9	Select all the slots on layer 1 etc.
		Ctrl + R	Select all shots in the slot containing the cursor
		Ctrl + U	User Interface Settings
		Z	User Configuration Settings
	SHOT SELECTION	Ctrl (copy settings)	By holding one shot above another shot will result that the covering shot copies the underlying shots handles, speed and framing.
		Ctrl	Enables selection mode, by clicking or dragging over shots toggles their selection state.
		Shift	Enables Selection mode, dragging over shots will select them. By clicking on a single shot will select everything on the same layer up to and including the current position on the timeline.
	NOTES	S	Show/Hide notes under the cursor
		N	Create / Edit note for the shot under the cursor
	CALCULATOR	Up / Right Arrow	Increments the value
		Down / Left arrow	Decrements the value

CONSTRUCT	SWIPES	Left	Show / Hide the construct selection list
		R	Reset to the default value
PLAYER	GENERAL	0-9	Toggle menu items
		Escape	Show/Hide notes under the cursor
		F1	Toggle between the player / construct
		F2	Player
		F3	Settings
		F4	Edit
		F5	Matrix
		F6	Process
		F7	Tray
		F8	Animate
		F9	Toggle Display LUT on / off
		F10	Toggle selected guides on / off
		F11	Show over mode on second head
		F12	Process the current shot
		Ctrl + F12	Process the current range
		`(or~)	Popup the player command menu
		Ctrl + `	Show / Hide screen toys
		Ctrl + S	Force auto save
		Ctrl + N	Toggle enable / disable control surface
		Ctrl + F1	Performance indicator
		Ctrl + F2 - F8	Custom command keys
		Alt + F10	Toggle the Film-strip On/Off
		Z	User Configuration Settings
	PLAYER NAVIGATION	Enter	Stop / Start play
	(Play only)	Space bar	Start/stop playback
		Left / Right arrow	Jog Backward / Forward (auto-repeat)
		Up / Down arrow	Play Forward / Backward
		Ctrl + Right arrow	Jump forward to next shot-marker / end

CONSTRUCT	SWIPES	Left	Show / Hide the construct selection list
		Ctrl + Left arrow	Jump backward to previous shot-marker / start
		Shift + Left / Right	Jump to the center of the next / prev. shot
		I / O	Set mark in / out point at current frame
		Backspace	Backwards through timeline position
		Shift + Backspace	Forwards through timeline position
		Ctrl + P	Toggle through play modes (loop / bounce / etc.)
	TRAY	T	Sync tray to current player position
		Ctrl + T	Sync current Player position to the Tray
		N	Open Note of current Shot for editing
		Ctrl + C	Copy the selected shot grading parameters
		J, Shift + J	Add current shot to tray/gallery, show copy mask dialog
		K, Shift + K	Apply current tray/gallery item, show paste mask dialog
		L, Shift + L	Copy current grade to tray/gallery selection, show mask dialog
		U	Create a Shot reference
		Y	Create a Frame reference
	METADATA	Up / Down arrow	Change selected row
		E	Put selected row in edit mode
		N	Open note of current shot for editing
VIEWPORT	GENERAL	Space bar	Pan display
	(Play only)	Space bar	Start / stop playback
		Alt	Scale display (Drag over Y or use scroll wheel)
		(WIN) Home **(OS X)** Home / FN + Left Arrow	Toggle display to Home / current position
		+ / -	Zoom In / Out from cursor position
		(WIN) End **(OS X)** End / FN + Right Arrow	Fit image guide to display
		(WIN) Ctrl + Home **(OS X)** Ctrl + Home / FN + Ctrl + Left Arrow	Fit image to display + controls

CONSTRUCT	SWIPES	Left	Show / Hide the construct selection list
		(WIN) Alt + Home **(OS X)** FN + Ctrl + Alt + Left Arrow	Fit image to display
		(WIN) Shift + Home **(OS X)** Shift + Home / FN + Shift + Left Arrow	Toggle display fullscreen + fit image size
		Alt + Click	Create copy of underlying Shot or CONstruct
		Tab	Toggle display fullscreen and hide all others
		M	Toggle Matte
		S	Toggle wipe view
		Shift + S	Toggle Over View (A-B mode) with the Reference
		D	Toggle dual view with the Reference
	(Play only)	D	Toggle dual view (To compare Versions)
		P	Toggle orbit view
		Ctrl + R,G,B,L,M,K	Toggle the color-channels
		Ctrl + 1-5	Toggle Statistics, Structure, Pipeline, Scaffolds, Mixer
		Ctrl + 6-9	Toggle Dual View, Split View, Wipe View, A-B View
		F	Modify framing (drag over Y or use scroll wheel)
		G	Toggle Grading
		X	Toggle overlay graphics on/ off
		R	Focus on the currently marked range
		W	Show / Hide layer selector
		Q	Show / Hide Layer List
		Ctrl + Q	Toggle 'Keep Layer Selected' mode
		PgUp / PgDown	Select version Up / Down
	SWIPES	Top	Show / hide info bar
		Bottom	Show / Hide player controls and control page
		Left / Right	Fullscreen - Stop, Play Backward / Forward Normar - Toggle screen toys / time-slot layer selector
	TOOLBAR	-	Zoom In Out from cursor position
		+	Zoom Out from cursor position
		Alt + Home	Fit image guide to display
		Shift + Home	Toggle display fullscreen + fit image size
MATRIX	GENERAL	0-9	Toggle menu items
		T	Toggle the trim buffer

CONSTRUCT	SWIPES	Left	Show / Hide the construct selection list
		Shift + PgUp / PgDwn	Select prev. / next scaffold
		(WIN) Insert **(OS X)** Cmd + I	Set keyframe
	GRADING CONTROLS	Ctrl + C	Copy the current color grading prameters
		Ctrl + V	Pastte the parameters from the global buffer
		J + Mouse Wheel	Adjust Color-A
		K + Mouse wheel	Adjust Lift
		L+ Mouse wheel	Adjust Gamma
		; + Mouse wheel	Adjust Gain
		' + Mouse wheel	Adjust Color-B on sceen
		P	Switch to the orbit view
		Ctrl	Activate Hue and Color reset controls
		Shift	Activate saturation and master reset controls
	LAYER CONTROLS	E	Toggle edit / axis mode
		A	Enable add
		B	Enable break
		J	Enable join
		L	Draw in linear / curve mode
		I	Enable L / C Toggle
		M	Toggle show matte
		Ctrl	Select multiple scaffolds
		Shift	Use uniform scaling (on-screen)
		Ctrl + A	Select all vertices
		Ctrl + D	De-select all vertices
		Delete	Delete the selected vertices
	CURVE EDITOR	Space bar	Pan editor time / value
		Alt	Scale editor time / value range
		(WIN) Home **(OS X)** Home / FN + Left Arrow	Set shot-length and curve height
		(WIN) Ctrl + Home	Set shot-length and curve height

CONSTRUCT	SWIPES	Left	Show / Hide the construct selection list
		(OS X) Ctrl + Home / FN + Ctrl Left Arrow	
		T	Enable global mode
		E	Enable edit
		A	Enable add
		B	Enable break
		J	Enable join
		S	Enable snap to frame position
		L	Keep tangent direction constant
		X	Keep time constant
		Y	Keep value constant
		V	Show time and value of current location
		I	Toggle linear / curve interpolation
		Shift	Select / De-select or drag selection
		Ctrl	Select / De-select or drag selection
		Ctrl + A	Select all vertices
		Ctrl + D	De-select all vertices
		Delete	Delete the selected vertices
	TRACKER	Backspace	Delete previous track point
		Delete	Delete current track point
EDIT	GENERAL	1-4	Toggle menu items
		[/]	Trim left / right
		< / >	Slip shot decrement / increment
		Shift + Mouse	Slip left / right
		(WIN) Insert **(OS X)** Cmd + I	Split the shot / insert new slot
		Delete	Delete the current slot
		Ctrl + F	Fit time slot to shot length
		Ctrl + PgUp	Select track up
		Ctrl + PgDown	Select track down
		Ctrl	Select multiple slots
		Ctrl + A	Select all slots on current track
		Ctrl + D	De-select all slots on current track
		(WIN) Ctrl + Home	Select to beginning

CONSTRUCT	SWIPES	Left	Show / Hide the construct selection list
		(OS X) Ctrl + Home / FN + Ctrl + Left Arrow	
		Ctrl + End	Select to end
		(WIN) N **(OS X)** N / FN + Ctrl + Right Arrow	Create / Edit note for the Shot under the cursor
	EDIT MODES	5	Reveal previous shot
		6	Reveal next shot
		7	Ripple
		8	Reveal media
		9	Insert / Overwrite
		0	Enable / disable drag
	VIEW CONTROLS	**(WIN)** Home **(OS X)** Home / FN + Left Arrow	Fit timeline to full lenght
		(WIN) Ctrl + Home **(OS X)** Ctrl + Home / FN + Ctrl + Left Arrow	fit timeline to shot size
		Space	pan across the edit
		Alt	Scale editor time and value range
		+ / -	Zoom in / Zoom out edit

B - Database, XML, XSLT and HTML

OVERVIEW

The data of a SCRATCH project is stored in a database. Besides manipulating project data through the regular user interface, you can also use XML scripting. This is especially useful when integrating SCRATCH into a workflow that included third party systems. The image below shows the general concepts and data flows involved.
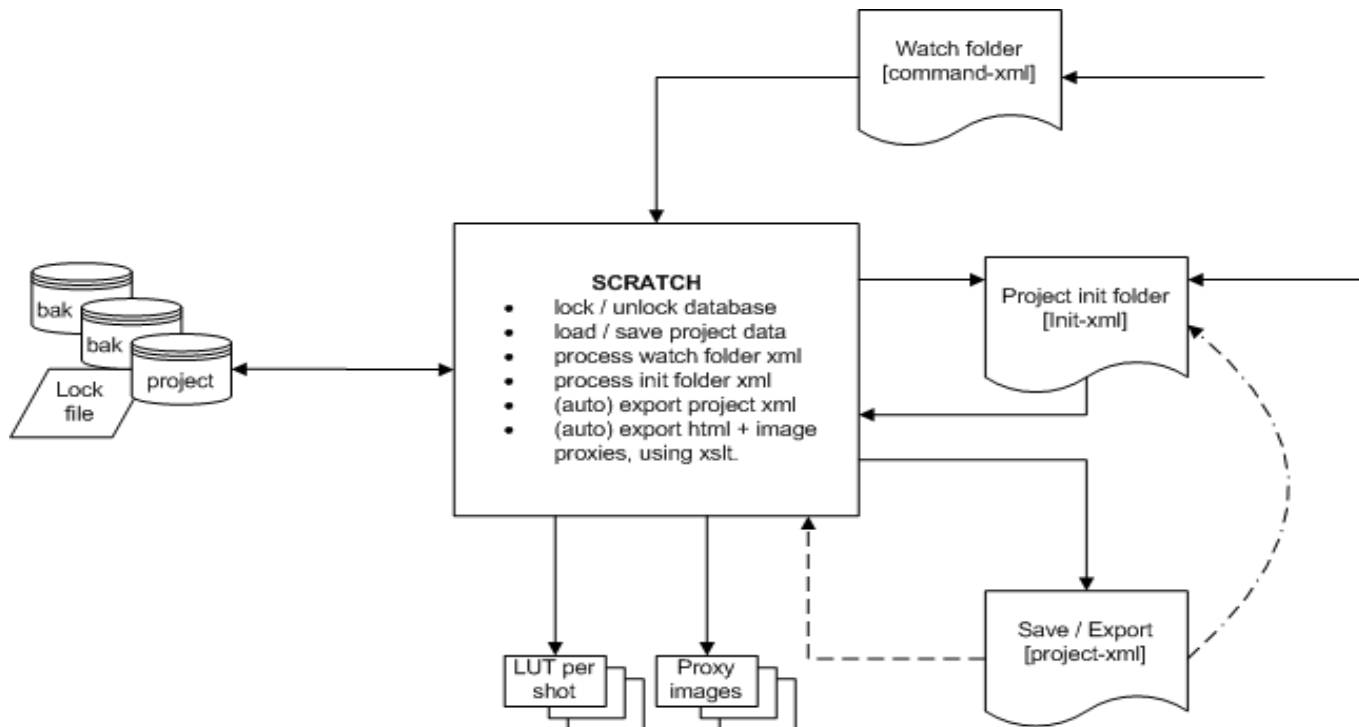
STORAGE OF PROJECT DATA

MAIN PROJECT DATABASE

All data of a project is stored in the project folder which is by default located in main projects folder
C:\ProgramData\Assimilator\Project\. This location can be changed in the **System** menu panel in the Start-up screen. The project folder contains a number of different files:

- **Project.db**; the main (SQLite format) database containing all project data. By default SCRATCH checks and saves changes every time the users switches between CONstructs, enters the Player or exits SCRATCH. You can switch off this auto-save through the system settings menu panel. If the auto save option is not set, you will be prompted to save changes when exiting SCRATCH.

- **Project.bak / Project.1.bak**; backup files - when entering a project a copy of the project database is made and renamed to .bak. Any previous backups are renamed with a version number. There is a maximum of 3 backups, older ones are removed.

- **ProjectCrash.bak / CrashLog.log**; in case of a crash, SCRATCH will when entering a new session automatically try to create a backup of the last project database that was use and make a copy of the log file that was written when the crash occurred.

- **Project.dbl**; a file containing the date-time since- and the name of the system that has the project in use. When opening a project this file is locked to prevent updating the project by another SCRATCH in multi-user situation. When closing the project, the file is cleared and unlocked.

- ***.reg**; old project files. When entering a pre version 5 project, SCRATCH will ask to upgrade the project data and create a new project database. The old files for storing data is maintained. These can still be used with older versions of SCRATCH but are not updated anymore. It is up to the user to manually remove them from the system.

SQLite is a widely used, very efficient database engine (http://www.sqlite.org/). There are numerous tools for opening a SQLite database file. Although you will be able to view the basic database structure of a SCRATCH project with a third party tool, most of the properties are stored in binary fields. Assimilate does **not** recommend altering the database directly with any third party tool. Neither do we advise to read or use data directly from the database for usage in a workflow; rather we recommend using the xml export- and scripting capabilities of SCRATCH for interfacing with other systems.

SHARING PROJECTS

It is possible to share the SCRATCH project folder among multiple SCRATCH systems by placing it on a central network driver. To change the location open the System Settings menu panel in the Logon module and change the Project folder.

Note: It is of the **utmost importance** that the central drive is controlled by a proper *file-locking mechanism*! In some cases SAN-environments lack this which might result in project database files corruption! In general, a shared drive that is controlled by a (Windows) server (operating system) does have the required mechanisms.

When, in a shared environment, SCRATCH notices that a project is already opened by another SCRATCH system it will display a message and open the project read-only. This means that you can play footage normally and even alter the project but none of the changes will be saved to the database.

XML OUTPUT AND SCRIPTING

There are different ways to interact with SCRATCH through XML

- **init-xml**; each project folder has init-folder which contain multiple xml files for updating the project. When a project is loaded, SCRATCH will check the init-folder and process any xml files in it. After processing the xml file it is removed. Through the init-xml you can add, update or remove various (properties of) items in a SCRATCH project; a group, a CONstruct, a slot or a shot. Any xml files in the init folder are also processed after using the **Refresh** button in the CONstruct.

- **command-xml** in the Watch folder; The Watch folder is set up as part of the **System** menu panel in the Start-up screen. All files that are dropped / copied into this folder will be processed. The following type of commands are supported:

    o   xml for updating a specific project; SCRATCH will create a new xml file in the init folder of the project indicated,

    o   xml for creating a new project.

    o   copy image sequences from an external data source to the local disks,

    o   remove (part of an) image sequence.

- **project-xml**. Through the Project Settings panel you can force SCRATCH to write project data in xml format to a designated folder each time a project is closed. This xml contains the basic project setup and can be used in workflows extending SCRATCH's domain.

- **project-xml** (*manual*). You can also export and import project data manually through the save and load buttons on the Timeline menu panel. Through this function you can select what to save (whole project, single group, single CONstruct) and in which format (binary saving all properties or xml, saving only basic project properties). The xml used in this function is the same as used in the project-init-folder function.

- **selection-xml**. When using the XML Export options with a Custom Command, SCRATCH creates an xml file with the data of the current selected shots.

XML TAGS, ATTRIBUTES AND FORMATS

A good way to gain insight in SCRATCH's XML scripting capabilities is to go through the xml that is created when saving a project in xml format [F]. Below is an overview of all xml-tags used.

project - xml

```
<?xml version="1.0"?>
<!---to save space this xml shows only the opening tags -->
<scratch datetime="" version="" project="">
  <!---a project can have multiple groups -->
  <groups>
   <!---project group + id; a group's identifier is its name -->
   <group name="">
     <!---annotation, including the level determined by the color coding [0-5] -->
     <note level="">
     <!---a group can contain multiple CONstructs -->
     <constructs>
     <!---project CONstruct + id;  a CONstruct's identifier is its name. The mode indicates slot-mode[1] or
freeform [0] -->
      <construct name="" mode="">
        <!---annotation, including the level determined by the color coding [0-5] -->
        <note level="">
        <resolution>
         <w>   <!---width -->
```

```
    <h>   <!---height -->
  </resolution>
  <aspect>
  <fps>   <!---framerate -->
  <record_tc> <!---timecode; format: hh:mm:ss:ff -->
  <audio>
   <file>   <!---absolute path + file -->
   <offset>  <!---number of frames -->
  </audio>
  <!---A construct can contain multiple slots; in case of a freeform construct the "Slots"-level does not
exist, going straight to Shots -->
  <slots>
   <!---CONstruct Slot and identifier; a Slot's identifier is either its index-position or its name. If
referenced by name and not found, a new slot with that name is created -->
    <slot index="" name="">
     <name>
     <length>
     <!---only present if explicitly set -->
     <transition>
      <type>     <!---one of the following values: Cut, Dissolve, Additive, Optical -->
      <before>   <!---number of frames -->
      <after>    <!---number of frames -->
     </transition>
     <smode>     <!---One of the following texts: Once, Loop, Bounce, Reverse, Rloop, Rbounce -->
     <!---s slot can contain multiple shots -->
     <shots>
      <!---shot + id; a Shot's id is a 64bit guid. The Layer attribute represents the position in the slot, in
case of a Freeform CONstruct the x- and y attributes are set with the position of the proxy image on the
CONstruct. -->
       <shot uuid="" layer="" x="" y="">
        <file>    <!---source media file; when used in an update and the file does not exist (yet),
SCRATCH will still update the node and continue with the script - but wil generate an error in the log -->
        <name>
        <reel_id>
        <scene>
        <take>
        <handles>
          <in>
          <out>
        </handles>
        <length>   <!---the length property is only provided in an xml-export and is not used in an xml-
import; manipulate the in- and out-handles to alter the length of a shot -->
        <aspect>
        <fps>
        <timecode>
        <!---framing parameters only present if explicitly set -->
        <framing>
         <offset>
           <x>
           <y>
         </offset>
         <scale>
           <x>
           <y>
         </scale>
         <rotate>
         <opacity>
```

```
          <!---framing can be animated for details on animation keyframe [kf-tag] formatting see the
paragraph on animation export / export in the Chapter 8 - Scaffolds -->
            <animation>
             <channel post="" pre="" id="">
              <kf>
              <kf>
              ....
            </framing>
            <!--- all primary grading parameters - only present if grading is applied to the shot -->
            <colorgrrade>
             <!---source transformation parameters -->
             <input>
              <remap> <!---linear, linlog, loglin, squared, custom -->
              <gamma>
              <lut> <!--- absolute path and file -->
              <flip>0</flip>
              <flop>0</flop>
             </input>
             <offset>
              <m> <!---master channel -->
              <r> <!---red -->
              <g> <!---green -->
              <b> <!---blue -->
             </offset>
            <!---the values for lift, gamma and gain parameters might not correspond with those in the
controls in the SCRATCH interface; As these values might be scaled by user settings, the XML script uses the
internal representations of those values-->
            <pre-gain>
             <m>
             <r>
             <g>
             <b>
            </pre-gain>
            <color-a>
             <h> <!---hue -->
             <s> <!---saturation -->
             <l> <!---lightness -->
            </color-a>
            <lift>
             <m>
             <r>
             <g>
             <b>
            </lift>
            <gamma>
             <m>
             <r>
             <g>
             <b>
            </gamma>
            <gain>
             <m>
             <r>
             <g>
             <b>
            </gain>
            <color-b>
```

```
          <h>
          <s>
          <l>
         </color-b>
         <tone>
          <c> <!---contrast -->
          <s> <!---scurve -->
          <d> <!---blur -->
         </tone>
         <lut> <!--- grading LUT, absolute path and file -->
        </colorgrrade>
        <audio>
         <file>      <!---absolute path and file -->
         <offset>   <!---number of frames -->
         <timecode>
         <roll>
        </audio>
        <!---annotation, including the level determined by the color coding [0-5] -->
        <note level="">
        <!---if available include shots in staging area of shot -->
        <staging>
         <shots>
           <shot uuid="" >
             <!--- identical from here / recursive -->
           </shot>
         </shots>
        </staging>
       </shot>
      </shots>
     </slot>
    </slots>
   </construct>
  </constructs>
 </group>
 </groups>
</scratch>
```

In the System Settings menu panel of SCRATCH you can set up a Watch folder. When SCRATCH is active, all files that are dropped / copied into this folder [A] will be parsed and (if valid command-xml) processed by SCRATCH [B]. Any processing is done in the background and, by default, processing will be halted if SCRATCH is playing a clip. In case you need more background processing power, you can overwrite this behavior by setting the SConfig variable AS_XML_PROCESS_IDLE. SCRATCH will then continuously process in the background, no matter what the user is doing.

There are 7 commands that can be used:

- append; add the objects specified - do not overwrite the properties of any existing item with the same identifier but create a new item (with new identifier).

- insert; add the objects specified - overwrite the properties of any objects with the same identifier.

- update; update the properties of the object specified. If the object with the identifier is not found discard the command.

- remove; remove the object specified.

- copy; copy (part of) an image sequence from a network drive to a local drive.

- delete; remove (part of) an image sequence from a local drive.

- killemall; removes any commands pending / currently processing

The command xml is formatted as shown below. Note that the parameters for the first 4 commands are formatted the same way as the project-xml shown before.

command xml

```xml
<?xml version="1.0"?>
<!---root tag with (optional) log_file attribute setting path + file where to write the results of processing
commands to -->
<scratch log_file="">
  <!---a single file can contain multiple commands -->
  <commands>
    <!---the action attribute specifies the type of command. the project attribute specifies to which project the
command is to be applied to and the (optional) identifier can be used for tracking a single command in the log
files. -->
    <command action="append" project="" command_id="">
      <!---the parameters for a command have the same hierargy / layout as the project xml -->
      ....... Project xml .....
    <command action="insert" project="" command_id="">
      ....... Project xml .....
    <command action="update" project="" command_id="">
      ....... Project xml .....
    <command action="remove" project="" command_id="">
      ....... Project xml .....
    <!---With this command you create a new project - the xml parameters are related to values in the Project
Settings menu -->
    <command action="create" command_id="" project="">
      <mediapath>      <!---the media path of the project  -->
      <renderpath>      <!---the render path of the projet -->
      <resolution>      <!---the project default resolution -->
        <h>
        <w>
      </resolution>
      <fps>            <!---the project default framerate -->
      <aspect>          <!---the project default aspect -->
    <!---With this command you can copy an image sequence from a network drive to a local drive, the project
attribute is optional and is only needed if the path specified is relative  to the media folder of the project -->
    <command action="copy" command_id="" project="">
      <source>        <!---the path + filename of the media to be copied; the first file in a sequence -->
      <destination>  <!---the destination folder -->
      <range>          <!---if you only want to copy part of a sequence, set an in and out point -->
        <in>
        <out>
      </range>
      <!---This tag specifies whether the files being copied will be altered to create real-time playable files. Some
image formats, such as TIFF for example, can be written in ways that are still legal files, but cannot be played in
real-time. The <img_mode>1</img_mode> tag attempts to convert files into a real-time playable format as
part of the copy process. -->
      <img_mode>
    <!---This commands removes an image sequence from the local drive -->
    <command action="delete" project="" command_id="">
      <source>
      <range>
        <in>
        <out>
      </range>
    <!---finally, there is a command to stop all previous / pending commands. This command needs no
parameters. Any commands after this will be processed normally. -->
    <command action="killemall" command_id="" />
  </commands>
</scratch>
```

The xml append, insert, update and remove - commands are parsed and SCRATCH will create a new xml file in the init folder of the project specified [C] in the attributes of the command. This init-xml has the same layout as project-xml for some additional attributes in the root node. The init xml will be parsed and processed [E] when the project is opened. The command-id and log-file attributes in the init-xml are passed from the command xml so one can continue to track a command.

init-xml

```
<?xml version="1.0"?>
<!---the action attribute specifies append, insert, update or remove. If no action is specified, the append action
is assumed. The sommand_id and log_file are copied from the original command-xml. -->
<scratch datetime="" version="" project="" action="" log_file="" command_id="">
  <!---the parameters for a command have the same hierargy / layout as the project xml -->
  ....... Project xml .....
```

Note that you can also create xml and place it directly into the init folder [D] of a project. Furthermore, you can also adjust a project-xml by adding an action attribute and load it through the load function [G] on the Timeline menu panel of the CONstruct.

Below are a couple of examples and their effects:

Insert A New Shot

```
<?xml version="1.0" encoding="UTF-8"?>
  <scratch log_file="C:\SOFTWARE\logs\XML.log">
    <commands>
      <command action="insert" project="My Project" command_id="insert_01" >
        <groups>
          <group name="XML">
            <constructs>
              <construct name="My Construct">
                <slots>
                  <slot index="1" name="xx"> <!--- a slot can be referenced by its index or by its name, if available
-->
                    <shots>
                      <shot layer="2" copy_grade="0" > <!--- the copy attribut4e allows for copying the grade of an
existing shot -->
                        <file>F:\My_Shots\Test_Shot.0001.dpx</file>
                      </shot>
                    </shots>
                  </slot>
                </slots>
              </construct>
            </constructs>
          </group>
        </groups>
      </command>
    </commands>
</scratch>
```

This example inserts the shot 'Test_Shot' into the Project named "My Project", Group named "XML" and the CONstruct named "My Consturct". Keep in mind that all counting starts at zero, so the shot will be inserted into the second slot of the CONstruct at the third layer up from the bottom.

Note: If both the *index* and the *name* are used in the slot-tag, the *index* is used. When no slot with the *name* that is referenced exists then by default the fist slot in the CONstruct is used.

Note: The copy_grade attribute can either contain a *slot-index* as value or a *uuid* of another shot. The slot index references a shot in the same slot before the actual insert.

Note: Inserting a new shot based on a filename will even create the shot if the file referenced does not exist (yet). However, an error will be written to the log-file. This way you can already create a timeline even if the physical media is not yet in the designated location.

Remove An Existing Shot

```xml
<?xml version="1.0" encoding="UTF-8"?>
 <scratch log_file="C:\SOFTWARE\logs\XML.log">
   <commands>
     <command action="remove" project="My Project" command_id="remove_01" >
       <groups>
         <group name="XML">
           <constructs>
             <construct name="My Construct">
               <slots>
                 <slot index="3">
                 </slot>
               </slots>
             </construct>
           </constructs>
         </group>
       </groups>
     </command>
   </commands>
</scratch>
```

This example removes the fourth slot in the specified CONstruct. All shots in the slot are removed as well. This is the equivalent of the BIN SLOT command from within the SCRATCH interface.

Rename A CONstruct

```xml
<?xml version="1.0" encoding="UTF-8"?>
<scratch log_file="C:\SOFTWARE\logs\XML.log">
 <commands>
   <command action="update" project="My Project" command_id="update_01" >
     <groups>
       <group name="XML">
         <constructs>
           <construct name="My Construct">
             <name>My Updated Construct</name>
           </construct>
         </constructs>
       </group>
     </groups>
   </command>
 </commands>
</scratch>
```

This example changes the name of "My Construct" to "My Updated Construct". Note that the original name is specified in the <construct name="My Construct"> while the new value is specified as a separate <name> tag within the <construct> tags. The results of the processing of command-xml or init-xml are written to the result-xml log file specified by the log_file= tag within the XML file. Multiple XML scripts can write into the same log file. Each will be appended to the end of the file and use the command_id= tag to reference the individual commands. By specifying different command_id= tags for each XML script, it is easy to troubleshoot script issues.

result xml

```xml
<?xml version="1.0"?>
 <results>
   <!---the code attribute specifies whether the command succeeded [1] or failed [0] -->
   <result cmd="" id="" date="" code="" msg="" />
   ....
```

SCRATCH will create the file if not present and only append to an existing file. Old log files are not removed.
There is a finite set of result codes:

```
  1: ok
 -1: invalid command tag '%s'
 -2: command canceled while processing
 -3: pending command aborted
 -4: pending command flushed
 -5: invalid xml, no parameter
 -6: invalid project reference
 -7: invalid source path
 -8: invalid destination path
 -9: invalid project-init path
-10: invalid project-media path
-11: file '%s' not available
-12: failed copying file '%s'
-13: no frames to copy
-14: failed to copy frame [%d] '%s' to '%s'
-15: insufficient disk space to copy frame [%d] '%s' to '%s'
-16: source path is not local to project
-17: failed reading project database
-18: project auto-exported is off
-19: failed creating init-xml
-20: failed stopping all pending commands
-21: failed processing project init-xml
```

In some cases additional details about (un)successful XML processing can be found in the regular SCRATCH log file.

Substitute Paths

Rather than referring to a full path in XML, you can also use relative path variables that are substituted when processed; using $MEDIA$ to refer to the media path of a project or use $IMPORT$ to refer to the path of the XML that is being processed.

Selection xml

When using the *xml_export*[select] option with a Custom Command, SCRATCH creates an xml file that includes the project and system context, as well as the data of all the selected shots:

```
<?xml version="1.0" encoding="UTF-8"?>
<scratch datetime="2011-11-11T01:01:01" version="6.1.700" project="MyProject" media_path="F:\Media"
temp_path="....\Projects\MyProject\Temp\" watch_folder="F:\watch\" >
  <shots group="Group" construct="Construct 5">
    <shot uuid="6c72ed0a-f52e-4a34-9190-4ba66de5effc" >
 <!-- identical to project xml, the shot-tag -->
    </shot>
  </shots >
</scratch>
```

XSLT AND HTML EXPORT

When using the HTML export function, SCRATCH performs an number of tasks:

- Create an XML file with the project data as described in the previous chapter.

- Perform an XSL Transformation on the XML using a customizable XSLT file. The output of the XSL Transform can be any format but is most often used to create HTML.

- Create a proxy-image file for each shot in the exported scope (CONstruct, Group, Project). The name of the image file is the uuid of the corresponding shot.

- Optionally create a 1D LUT for each shot in the exported scope (CONstruct, Group, Project). The name of the LUT file is the uui of the corresponding shot.

By default SCRATCH uses the XSLExport.xslt in the \Program Files\Assimilate\Settings folder. You can customize this xslt by copying the file \ProgramData\Assimilator\Settings folder first and then edit it.

Note: Editing XSLT requires specialized know-how and is beyond the scope of this manual. The internet provides many sources of information on XSL and its possible usage.

When creating your own XSL you nee to know that SCRATCH provides two parameters as input for the XSL that you can use:

- **level** - indicating the scope of the export; project = 0, group = 1, CONstruct = 2. The XSL needs to be aware of the export level as this determines the XML layout.

- **images** - this is the folder name where the proxy-images are saved to. The XSL needs to be aware of the folder to be able to reference the proxy images.

The HTML export function requires a **REMOTE** License extension.

C - Panel Mapping

SCRATCH CONTROL LIST

The following is a list of all SCRATCH Controls that can be mapped to panel controls. For each Control, the function of each Map parameter is shown. VALUE indicates the parameter has a value that can be controlled. These are usually mapped to encoders, such as Trackballs or Knobs. An X indicates the parameter is a single-action button with no value associated. These are usually mapped to buttons on the control surface. A dash indicates that nothing is associated with that particular Map.

Map

Several SCRATCH controls have multiple channels or Maps. For example, the Lift control has three Maps; one for the horizontal axis of the color wheel, one for the vertical axis of the color wheel, and a third for the master adjustment. Each of these Maps must be assigned to a different panel control. If you look at the default panel mapping under the Default Menu Group, there are three Mapping Pairs associated with the Lift control. They are assigned to Trackball 1's X, Y and Z axes. If you select one of the Mapping Pairs, you will see the associated Map value. Notice that the Map value is different for each axis.

Most SCRATCH parameters have two Maps; Map 0 is the parameter's value and Map 1 is the reset for the parameter. So, creating a Mapping Pair using Map 0 links the panel control to the actual SCRATCH parameter's value, and creates a second Mapping Pair (usually using a button); using Map 1 links that panel control to resetting the SCRATCH parameter.

The 0-15 is for selecting the menu entry of a popup button to activate at once. So, map "Canvas Select" with Map value 4 to a button to directly create a Canvas with Circle.

Calculator

SCRATCH	DESCRIPTION	MAP 0	MAP 1	MAP 2
Calc 0	Calculator button 0	X	-	-
Calc 1	Calculator button 1	X	-	-
Calc 2	Calculator button 2	X	-	-
Calc 3	Calculator button 3	X	-	-
Calc 4	Calculator button 4	X	-	-
Calc 5	Calculator button 5	X	-	-
Calc 6	Calculator button 6	X	-	-
Calc 7	Calculator button 7	X	-	-
Calc 8	Calculator button 8	X	-	-
Calc 9	Calculator button 9	X	-	-
Calc.	Calculator button .	X	-	-
Calc:	Calculator button :	X	-	-
Calc Add	Calculator Add button	X	-	-
Calc Sub	Calculator Subtract button	X	-	-

SCRATCH	DESCRIPTION			
Calc Mud	Calculator Multiply button	X	-	-
Calc Div	Calculator Divide button	X	-	-
Calc Inc	Increase value by one	X	-	-
Calc Dec	Decrease value by one	X	-	-
Calc Reset	Calculator Reset button	X	-	-
Calc Clear	Calculator Clear button	X	-	-
Calc Sign	Swap numbers from positive to negative or vice-versa	X	-	-
Calc Enter	Accept the current value and close the On-screen Calculator	X	-	-

Audio

SCRATCH	DESCRIPTION	MAP 0	MAP 1	MAP 2
Master Vol	Manage the overall audio level	VALUE	-	-

Matrix

SCRATCH	DESCRIPTION	MAP 0	MAP 1	MAP 2
CMKey-Gain	The matte's alpha channel is multiplied by the gain value. When picking a color the gain is set as such that the resulting matte will have full alpha at that color.	VALUE	-	-
CMKey-Sub-scale	The sub-scale parameter changes the scale of subtraction. With a sub-scale of zero there is no subtraction and the resulting alpha will be equal to the reference channel for the whole image.	VALUE	-	-
CMKey-Positve	The effect of the positive and negative values is similar to the sub-scale parameter. But these values only influence the subtraction scale of one color instead of both.	VALUE	-	-
CMKey-Negative	The effect of the positive and negative values is similar to the sub-scale parameter. But these values only influence the subtraction scale of one color instead of both.	VALUE	-	-
CMKey-Density	The Density setting changes the proportions of the recessive colors' weight.	VALUE	-	-
KeyX_-CRS	RGB Key values Color, Range and Softness	VALUE	VALUE	VALUE
KeyX_-S0	RGB Key lower Softness value	VALUE	RESET	-
KeyX_-R0	RGB Key lower Range value	VALUE	RESET	-
KeyX_-R1	RGB Key upper Range value	VALUE	RESET	-
KeyX_-S1	RGB Key upper Softness value	VALUE	RESET	-
Stack Select	Selects a version in the stack	VALUE	-	-

Stack Previous	Selects the previous version in the stack	X	-	-
Stack Next	Selects the next version in the stack	X	-	-
Framing-SX	Shot Framing X scale	VALUE	RESET	-
Framing-SY	Shot Framing Y scale	VALUE	RESET	-
Framing-DX	Shot Framing X offset	VALUE	RESET	-
Framing-DY	Shot Framing Y offset	VALUE	RESET	-
Framing-RZ	Shot Framing Z rotation	VALUE	RESET	-
S-Opacity	Layer Opacity	VALUE	RESET	-
Undo	Undo	X	-	-
Redo	Redo	X	-	-
Reset	Reset	X	-	-
Tone	Tone value for Highlight, Shadow or Midtone in the Qualifier	VALUE	RESET	-
Offset	Offset for Highlight, Shadow or Midtone in the Qualifier	VALUE	RESET	-
Range	Range for Highlight, Shadow or Midtone in the Qualifier	VALUE	RESET	-
Key-Invert	Key value invert for Qualifiers	X	-	-
KeyMode	Key Mode of a Qualifier	VALUE	-	-
ResetKey	Key value reset for Qualifiers	X	-	-
KeyGain	Key value gain for Qualifiers	VALUE	-	-
KeyPreBlur	Key value preblur for Qualifiers	VALUE	-	-
KeyExpand	Key value expand for Qualifiers	VALUE	-	-
KeyPostBlur	Key value postblur for Qualifiers	VALUE	-	-
SpillMode	Modes for spill suppression	X	-	-
SpillRange	Set the range around key-color on which the Spill-suppression is applied to	VALUE	-	-
LumKey-SX	Luminance X scale	VALUE	-	-
LumKey-SY	Luminance Y scale	VALUE	-	-
LumKey-DX	Luminance X offset	VALUE	-	-
CC-Copy	Copy grade	X	-	-
CC-Paste	Paste grade	X	-	-
Mem1	Memory Bank item 1	X	-	-
Mem2	Memory Bank item 2	X	-	-
Mem3	Memory Bank item 3	X	-	-
Mem4	Memory Bank item 4	X	-	-

Mem5	Memory Bank item 5	X	-	-
Mem6	Memory Bank item 6	X	-	-
Mem7	Memory Bank item 7	X	-	-
Mem8	Memory Bank item 8	X	-	-
Invert	Invert on Levels menu	X	-	-
MX-Input	Open the Matrix Input menu	X	-	-
MX-Levels	Open the Matrix Levels menu	X	-	-
MX-Color	Open the Matrix Color menu	X	-	-
MX-Numeric	Open the Matrix Numeric menu	X	-	-
MX-Curves	Open the Matrix Curves menu	X	-	-
MX-Vectors	Open the Matrix Vectors menu	X	-	-
MX-LUT	Open the Matrix LUT menu	X	-	-
MX-Canvas	Open the Matrix Canvas menu	X	-	-
MX-Mask	Open the Matrix Mask menu	X	-	-
MX-Qualifier	Open the Matrix Qualifier menu	X	-	-
MX-Texture	Open the Matrix Texture menu	X	-	-
MX-Camera	Open the Matrix Camera menu	X	-	-
Toggle Layer	Toggle selected Layer	X	-	-
Trim Color	Toggle the Trim grade on/off	X	-	-
Trim Update	Update Trim Buffer	X	-	-
Trim Restore	Restore Trim Buffer	X	-	-
Trim Previous	Apply the previous shot's grade	X	-	-
Trim Position	Apply position's grade	X	-	-
Trim Next	Apply the next shot's grade	X	-	-
Copy Up	Copy current grade to version above	X	-	-
Copy Down	Copy current grade to version below	X	-	-
6V-Next	Creates an Alt-Key button	X	-	-
6V-Prev	Creates an Alt-Key button	X	-	-
6V Select	6-Vector selection	VALUE	RESET	-
6V Offset	6-Vector Offset	VALUE	RESET	-
6V Range	6-Vector Range	VALUE	RESET	-
6V Hue	6-Vector Hue	VALUE	RESET	-
6V Saturation	6-Vector Saturation	VALUE	RESET	-
6V Lightness	6-Vector Lightness	VALUE	RESET	-

6V Reset	6-Vector Reset	VALUE	RESET	-
Dir-Offset	Direction Offset	Master	X-axis	Y-axis
Dir-PreGain	Direction PreGain	Master	X-axis	Y-axis
Color-A	Color-A Hue and Saturation	Saturation	Hue	-
Lift	Lift	Master	X-axis	Y-axis
Gamma	Gamma	Master	X-axis	Y-axis
Gain	Gain	Master	X-axis	Y-axis
Color-B	Color-B Hue and Saturation	Saturation	Hue	-
F-Reset-Off	Full reset of Offset	X	-	-
F-Reset-PG	Full reset of PreGain	X	-	-
F-Reset-CA	Full reset of Color-A	X	-	-
F-Reset-Lift	Full reset of Lift	X	-	-
F-Reset-Gamma	Full reset of Gamma	X	-	-
F-Reset-Gain	Full reset of Gain	X	-	-
F-Reset-CB	Full reset of Color-B	X	-	-
C-Reset-Off	Reset only the Hue for Offset	X	-	-
C-Reset-PG	Reset only the Hue for PreGain	X	-	-
C-Reset-A	Reset only the Hue for Color-A	X	-	-
C-Reset-Lift	Reset only the color change for Lift	X	-	-
C-Reset-Gain	Reset only the color change for Gain	X	-	-
C-Reset-Gamma	Reset only the color change for Gamma	X	-	-
C-Reset-B	Reset only the Hue for Color-A	X	-	-
M-Reset-Off	Reset only the master for Offset	X	-	-
M-Reset-PG	Reset only the master for PreGain	X	-	-
M-Reset-A	Reset only the Saturation for Color-A	X	-	-
M-Reset-Lift	Reset only the master for Lift	X	-	-
M-Reset-Gain	Reset only the master for Gain	X	-	-
M-Reset-Gamma	Reset only the master for Gamma	X	-	-
M-Reset-B	Reset only the Saturation for Color-B	X	-	-
Contrast	Contrast	VALUE	RESET	-
S-Curve	S-Curve	VALUE	RESET	-
Defocus	Defocus	VALUE	RESET	-
OffsetM	Offset Master	VALUE	RESET	-
OffsetR	Offset Red	VALUE	RESET	-

OffsetG	Offset Green	VALUE	RESET	-
OffsetB	Offset Blue	VALUE	RESET	-
PreGainM	Pre-Gain Master	VALUE	RESET	-
PreGainR	Pre-Gain Red	VALUE	RESET	-
PreGainG	Pre-Gain Green	VALUE	RESET	-
PreGainB	Pre-Gain Blue	VALUE	RESET	-
Hue-A	Color-A Hue	VALUE	RESET	-
Saturation-A	Color-A Saturation	VALUE	RESET	-
Lightness-A	Lightness for Color-A	VALUE	RESET	-
Lift-M	Master Lift	VALUE	RESET	-
Lift-R	Red Lift	VALUE	RESET	-
Lift-G	Green Lift	VALUE	RESET	-
Lift-B	Blue Lift	VALUE	RESET	-
Gain-M	Master Gain	VALUE	RESET	-
Gain-R	Red Gain	VALUE	RESET	-
Gain-G	Green Gain	VALUE	RESET	-
Gain-B	Blue Gain	VALUE	RESET	-
Gamma-M	Master Gamma	VALUE	RESET	-
Gamma-R	Red Gamma	VALUE	RESET	-
Gamma-G	Greem Gamma	VALUE	RESET	-
Gamma-B	Blue Gamma	VALUE	RESET	-
Hue-B	Color-B Hue	VALUE	RESET	-
Saturation-B	Color-B Saturation	VALUE	RESET	-
Lightness-B	Lightness for color-B	VALUE	RESET	-
Select-Layer	Layer Selection	VALUE	DESELECT	-
Create-Layer	Create a new Layer	X	-	-
Del-Layer	Delete selected Layer	X	-	-
Layer-Solo	Isolate the viewing of a Layer	X	-	-
Canvas Select	Canvas Shape Selection Canvas Select + Map0 = Freeform Canvas Select + Map3 = Rectangle Canvas Select + Map4 = Circle Canvas Select + Map5 = Bicubic	VALUE	-	-
Opacity	Opacity of a Layer	VALUE	RESET	-
Blend RGB	Modes for RGB blending	VALUE	-	-
Blend Alpha	Modes for Alpha blending	VALUE	-	-

ShowKey	Toggle Show Key on/off for Qualifiers	X	-	-
Layer-DX	Layer X offset	VALUE	RESET	-
Layer-DY	Layer Y offset	VALUE	RESET	-
Layer-SX	Layer X scale	VALUE	RESET	-
Layer-SY	Layer Y scale	VALUE	RESET	-
Layer-R	Layer Z rotation	VALUE	RESET	-
Layer-Soft	Layer Softness	VALUE	-	-
Canvas-Invert	Invert a Canvas's effect	X	-	-
Canvas-Smooth	Toggle Smooth on/off for Canvas Softness	X	-	-
Layer-TxDX	Texture Trans X	VALUE	RESET	-
Layer-TxDY	Texture Trans Y	VALUE	RESET	-
Layer-TxSX	Texture Scale X	VALUE	RESET	-
Layer-TxSY	Texture Scale Y	VALUE	RESET	-
Layer-TxRot	Texture Rotate	VALUE	RESET	-
F-Blur	Texture Front Blur	VALUE	RESET	-
F-Use-Dblur	Front Directional Blur	X	-	-
F-Blur-Angle	Front Blur angle	VALUE	RESET	-
M-Blur	Matte Directional Blur	VALUE	RESET	-
M-Use-Dblur	Matte Directional Blur	X	-	-
M-Blur-Angle	Matte Blur angle	VALUE	RESET	-
Tray Add Ref	Add Reference to Tray	X	-	-
Tray Shot Ref	Add Shot reference to Tray	X	-	-
Tray Frame Ref	Add Frame reference to Tray	X	-	-
Tray Apply	Apply Tray Item	X	-	-
Tray Toggle Preview	Preview Tray Item	X	-	-
Tray Selection Left	Tray Selection Left	X	-	-
Tray Selection Right	Tray Selection Right	X	-	-
Tray Selection Up	Tray Selection Up	X	-	-
Tray Selection Down	Tray Selection Down	X	-	-
LoopMode	The LOOP MODE controls how a shot behaves if the slot is longer than the actual source clip's IN and OUT points	VALUE	-	-
PlaySpeed	Play speed menu	VALUE	-	-
CurFrame	Current Frame value	VALUE	-	-
Rewind	Go to the beginning of the timeline	X	-	-

JogRev	Jog one frame backwards	X	-	-
Play	Play Forward	X	-	-
Stop	Stop Playback	X	-	-
JogFwd	Jog one frame forward	X	-	-
Forward	Go to the end of the timeline	X	-	-
Prev	Go to the next keyframe / go to the head of the previous shot	X	-	-
Next	Go to the previous keyframe / go to the head of the next shot	X	-	-
View-Range	Range button	X	-	-
Nav. Keyframes	Navigate Keyframes	X	-	-
Mark-In	Mark and IN point	X	-	-
Mark-Out	Mark and OUT point	X	-	-
ToggleMixerPanel	Show/hide Mixer Panel	X	-	-
Nav-backward	Navigate to previous shot	X	-	-
Nav-Forward	Navigate to next shot	X	-	-
ToggleMemoryPanel	Show/hide Memory Panel	X	-	-
PL-Menu	Open the Player menu	X	-	-
Output Cache	Enable Output cache	X	-	-
Edit-Menu	Open the Edit Menu	X	-	-
CG-Menu	Open the Color Grading (Matrix) menu	X	-	-
Prc-Menu	Open the Process menu		-	-
Tray	Open the Tray menu	X	-	-
Animate	Open the Animate menu	X	-	-
Cn Stack Select	Selects a version in the stack (Construct)	VALUE	-	-
Cn Stack Previous	Selects the previous version in the stack (Construct)	X	-	-
Cn Stack Next	Selects the next version in the stack (Construct)	X	-	-
Stack Add	Adds a version in the stack	X	-	-
Stack Delete	Delete a version in the stack	X	-	-
Statistics, Structure, PipeLine, Layers Stack	Toggle screen toys	X	-	-
Timeline-Tray	Toggle Timeline Tray	X	-	-
VecKey-Range	Set Vector Keyer Range	VALUE	RESET	-

VecKey-Softness	Set Vector Keyer Range Softness	VALUE	RESET	-
VecKey-Shadow	Set Vector Keyer Shadow	VALUE	RESET	-
VecKey-Sh.Soft	Set Vector Keyer Shadow Softness	VALUE	RESET	-
VecKey-Highl	Set Vector Keyer Highlight	VALUE	RESET	-
VecKey-Hl.Soft	Set Vector keyer Hightlight Softness	VALUE	RESET	-
Dual View	Toggle dual view mode	X	-	-
Over Mode	Displays two images over each other for comparison.	X	-	-
Right View	Toggle reference view	X	-	-
ZoomOut	Zoom out	X	-	-
ZoomIn	Zoom in	X	-	-
Home	Scale 1:1	X	-	-
ZoomFit	Zoom fit	X	-	-
ZoomOut R	Zoom Out reference view	X	-	-
ZoomIn R	Zoom In reference view	X	-	-
Home R	Reference Scale 1:1	X	-	-
ZoomFit R	Zoom Fit reference view	X	-	-
Overlay	Toggle overlays on/off	X	-	-
Link Views	Toggle Link views on/off	X	-	-
ToggleGrade	Toggle Grade on/off	X	-	-
ToggleGrade R	Toggle Grade Reference on/off	X	-	-
Copy View	Use Current Left View	X	-	-
View Output	View Main Output	X	-	-
View Output R	View Main Output in Reference	X	-	-
View Trim	Show Trim Buffer	X	-	-
AB-Mode	Toggle difference view A-B and A-B	VALUE	-	-
AB-Trans	Set level in which the A image is shown more / less opaque.	VALUE	RESET	-
AB-Wipe	Wipe bar position	VALUE	RESET	-
AB-Rotate	Rotate bar	VALUE	RESET	-
AB-Gain	Highlight differences between images	VALUE	RESET	-
2Dspl Over Mode	Displays two images over each other for comparison on second display.	X	-	-

Edit

SCRATCH	DESCRIPTION	MAP 0	MAP 1	MAP 2
EDT-shot-in	Edit IN point that is being used on the source clip	VALUE	RESET	-
EDT-shot-out	Edit OUT point that is being used on the source clip	VALUE	RESET	-
EDT-shot-slip	The slip parameter determines how many frames there are between the actual first frame of the source clip and the first frame being used in the edit.	VALUE	RESET	-
EDT-shot-speed	Speed of the current shot	VALUE	-	-
EDT-shot-flip	Horizontally scale a shot	X	-	-
EDT-shot-flop	Vertically scale a shot	X	-	-
EDT-slot-start	Numerical Slate indicates the absolute frame number in the timeline where the current slot begins	VALUE	RESET	-
EDT-slot-length	The total length of the current slot	VALUE	RESET	-
EDT-mode-left	Reveal Previous shot	X	-	-
EDT-mode-right	Reveal Next shot	X	-	-
EDT-mode-ripple	Ripple	X	-	-
EDT-mode-reveal	Reveal Media	X	-	-
EDT-mode-Insert	Insert vs Overwrite mode	VALUE	-	-
EDT-mode-drag	Enable / Disable drag mode	X	-	-
EDT-act-insert	Insert an edit in the current position - splitting the current slot.	X	-	-
EDT-act-remove	Delete all the selected slots.	X	-	-
EDT-act-fit	Adjust the length of the current slot to match the IN and OUT points of the shot.	X	-	-
EDT-act-trim-left	Trim Left	X	-	-
EDT-act-trim-right	Trim Right	X	-	-

Settings

SCRATCH	DESCRIPTION	MAP 0	MAP 1	MAP 2
Output Cache	Enable Output cache	X	-	-

D - Supported Media formats

SCRATCH Supports the following media formats.

FORMAT		PC	PC	MAC	MAC
		Read	Write	Read	Write
AATON Cinema DNG	.dng	Yes	-	Yes	-
Avid Media Toolkit (AMT) AAF	.aaf	Yes	Yes	-	Yes
Avid Media Toolkit (AMT) MXF	.mxf	Yes	Yes	Yes	Yes
Avid Media Toolkit (AMT) DNxHD	.mxf	Yes	Yes	Yes	Yes
ARRI raw	.ari	Yes	-	Yes	-
AVC-HD	.m2ts, .tms	Yes	-	Yes	-
BlackMagic Camera Cinema DNG	.dng	Yes	-	Yes	-
BlackMagic Pocket Cinema Camera DNG	.dng	Yes	-	-	-
Bolex Cinema DNG	.dng	Yes	-	Yes	-
CANON C300 MXF	.mxf	Yes	-	Yes	-
CANON C500 raw	.rmf	Yes	-	Yes	-
CINEFORM AVI	.avi	Yes	-	Yes	-
CINEFORM DPX	.dpx	Yes	-	Yes	-
CINEFORM MOV	.mov	Yes	-	Yes	-
Cineon	.cin	Yes	Yes	Yes	Yes
Cinemacraft H264	.mp4	Yes	Yes	-	-
DPX	.dpx	Yes	Yes	Yes	Yes
FFMpeg H264/avc1		Yes	-	Yes	-
GoPro HD, Hero, 2, 3, 4K	.mov, .mp4	Yes	-	Yes	-
IKONOSCOP Cinema DNG	.dng	Yes	-	Yes	-
Jpeg	.jpeg, .jpg, .jpe	Yes	Yes	Yes	Yes
Jpeg 2000	.jpg, .jp2, .j2c, .jpx	Yes	Yes	Yes	Yes
MAGIC LANTERN raw (Canon)	.raw	Yes	-	Yes	-
MP4 (SONY MPEG-2)	.mp4	Yes	-	Yes	-
OpenEXR compressed	.zip, .zips, .rle, .piz, .pxr24, .b44, .b44a	Yes	Yes	Yes	Yes
OpenEXR uncompressed	.exr	Yes	Yes	Yes	Yes
OpenSXR	.sxr	Yes	-	Yes	-
PANASONIC MXF (AVC-i100, DVCPro..)	.mxf	Yes	-	Yes	-

PHANTOM (HD, Flex, Miro, Gold, Flex4K)	.cine	Yes	-	Yes	-
Portable Network Graphics	.png	Yes	-	Yes	-
QUICKTIME	.mov	Yes	Yes	Yes	Yes
QUICKTIME APPLE PRORES	.mov	Yes	Yes	Yes	Yes
QUICKTIME AVI	.avi	Yes	-	Yes	-
QUICKTIME H264	.mov	Yes	Yes	Yes	Yes
RawMagic Cinema DNG	.dng	Yes	-	Yes	-
REDCODE REDONE, SCARLET, EPIC, DRAGON	.r3d	Yes	-	Yes	-
REDCODE Monochrome	.r3d	Yes	-	Yes	-
RHOZET CARBON CODER AVC-100	.mxf	Yes	-	Yes	-
SI2K raw (SIV)	.slv	Yes	-	Yes	-
Silicon Graphics	.sgi, .rgb	Yes	Yes	Yes	Yes
SONY F5 / F55 / F65 / FS700 / SR raw	.mxf	Yes	-	Yes	-
SONY HDV	.mov	Yes	-	Yes	-
SONY MPEG-2	.mp4	Yes	-	Yes	-
SONY XAVC HD & 4K	.mxf	Yes	-	Yes	-
SONY XDCAM / DVCPro	.mxf	Yes	-	Yes	-
Targa	.tga	Yes	Yes	Yes	Yes
TELESTREAM VANTAGE Transcoder	.slv	Yes	-	Yes	-
Tiff	.tiff	Yes	Yes	Yes	Yes
Windows Bitmap	.bmp	Yes	-	Yes	-

SCRATCH / SCRATCH Lab Release History
V8.0 RELEASE [MARCH 2014]
....
V7.0 UPDATE RELEASES

- Build 766 (6 Dec '13)
    - Fixes an issue with applying LUTs, which under certain circumstances when rendering a long timeline, could product invalid results.
- Build 765 (15 Nov '13)
    - Update on file locking scheme on OSX
    - Fix for LUT export option with Custom Commands
- Build 764 (30 Oct '13)
    - Fix for loading F55/F5 2k display streams

- o Masks on anamorphic sources where not always displaying and rendering correct
- Build 762 (16 Oct '13)
  - o Updates for improving reading F65 media from central SAN storage.
  - o Additional updates for project sharing on OS X.
  - o Fix for issue with saving Output templates.
- Build 760 (26 Sep '13)
  - o **Note**: This build requires you to reactivate your license keys. If you have a valid support contract you can just use your existing key. If you are having problems reactivating your key please contact licensing@assimilateinc.com.
  - o New RED SDK - including RED Dragon support. For Red Rocket support please update to driver/firmware to 1.4.36/1.1.17.3, available from the RED website,
  - o Fix for database file locking on OSX to support project sharing,
  - o Fix on AJA where overlay were shown upside down,
  - o Fix on Sony reading XML meta data.
- Build 759 (3 Sep '13)
  - o Fix for Sony Raw - not always recognized the correct format.
- Build 758 (28 Aug '13)
  - o Support for Sony FS700 camera
  - o Fix for issue with cube LUTs
- Build 755 (30 July '13)
  - o Optimization and fix for the ACES implementation: clipping could occur in the RRT transform on extreme values.
  - o Under certain conditions an error in a (QuickTime) output node could lead to the removal of all prior rendered files of that node.
  - o Adjusted AJA Kona implementation in that the image orientation is now the same as most other applications so that there is no need to restart the system when switching between applications or to rewire cables in a 4k setup.
  - o Update on Playout - using the Kona 422 output on the Mac could freeze the application when trying to connect to the VCR.
- Build 754 (16 July '13)
  - o Included a Fast Start / Web-optimized option for QuickTime output.
  - o Refresh issue with plug-ins where under certain conditions the grade of a shot was not always properly updated.
  - o Solved an issue on OSX where a limit on the number of opened files was not properly overwritten and could cause failure to open certain files.
  - o Update on XML scripting background process - a log messages was only written after all commands were fully processed rather than after each finished command.
- Build 753 (5 July '13)
  - o Image on dual head was not always properly refreshed when using a plug-in for the second screen.
  - o XML auto-export always included generating proxies and xslt transform.
  - o Update on JPeg2000 for DCI compatibility.
  - o Solved an issue on OSX were under certain circumstances the wrong texture was rendered.
- Build 752 (4 June '13)
  - o Added support for 4k output from the AJA Kona 3G.
  - o Reading external xml meta data files with Sony footage and processing ASC-CDL parameters if set.
  - o Dual stream SDI output was showing anaglyph image.

- o Fixed issue with reading R3D RMD files that were edited in redcinex.
- o Timecode was not read correct from certain MXF files.
- o Issue with Qualifier on 10bit source footage when used in combination with masks.
- o Fix issue with reading CTL file that could clip the image.
- o Assemble: direction of dissolves where not always properly read from aaf files. On export EDL - any clip name version postfixes are stripped.
- o 3:2 Pull-down node did not show proper length.
- Build 751 (1 May '13)
  - o Fixing issue with 3D LUTs / curves that could cause a color shift.
  - o Fix for AJA SDI - sync output channels when dual stream (stereo) is enabled.
  - o Dropping a scaffold in the Tray could potentially crash the application.
- Build 749 (13 Mar '13)
  - o Fix for wrong offset with 3D grading LUT.
  - o Fix for re-link issue with ARRI footage.
  - o Fix for AJA analog mode detection on window.
- Build 748 (8 Mar '13)
  - o Fixes an issue with 3d LUTs that was introduced in the previous build.
  - o JPEG2000 would always include alpha channel, even if RGB was selected.
  - o Color space setting was not always maintained when creating a version.
  - o Update for OFX plug-ins that need more than 5 control tabs.
- Build 747 (5 Mar '13)
  - o Fixes an issue with the Watch folder on OS X
- Build 746 (25 Feb '13)
  - o Fixes an issue with the Cube LUT format.
  - o Shot Input color space settings were not properly pasted with Paste Frw function.
  - o Support for analog output from the Kona 3G card.
- Build 745 (19 Feb '13)
  - o Update on Color Space management. Please read this article explaining how SCRATCH deals with color spaces and ACES in particular, as well as giving workflow suggestions.
  - o HDMI output for the AJA T-TAP was not properly working.
  - o In certain cases a shot's metadata items were duplicated when using undo functions which could cause the project database to grow rapidly.
  - o Display LUT on SDI was in certain cases not properly applied.
  - o In some cases SCRATCH auto-selected the wrong CUDA/OpenCL device.
- Build 743 (25 Jan '13)
  - o new **ARRI Fast debayer option**. SCRATCH's own debayer method (as opposed to using the ARRI SDK), build for speed while preserving color accuracy. The Fast debayer option is set as default option when loading new media.
  - o upgraded the **JPEG2000** implementation to render **DCI compliant** output. In the Advanced settings dialog you can set the JPEG2000 Encoding format (DCI Compliant, Lossless or Lossy) and bit rate. Note that for DCI compliance there are two profiles: CINEMA 2k and CINEMA 4k. CINEMA 2k requires a framerate of either 24 or 48 fps, while CINEMA 4k only accepts 24 fps. The standard resolution for CINEMA 2k is 2048 x 1080. To maintain DCI compliance either the x- or y-dimension should follow this standard resolution with the other dimension

either being equal or smaller than the default. For CINEMA 4k the default resolution is 4096 x 2160. The bit rate is maximum (and default) 250 Mbs. In the Advanced settings you can set a lower value if required.

- o New **Sony** SDK with new **F5** and **F55** support and for the F65 format, newly added 6k and 8k support.
- o New **RED SDK** with support for monochrome media, DRX control on the Red Rocket and additional metadata items (such as scene and take). Red Rocket requires driver 1.4.32.0 and firmware 1.1.16.11.
- o Load multi-view EXR images as under/over images.
- o Update on the benchmark / profile function of SCRATCH for measuring IO performance.
- o Other fixes:
    - ▪ Output temples with QuickTime nodes sometimes used wrong resolution.
    - ▪ The colorspace/LUT for dual head was not always properly applied.
    - ▪ Dropping shot in dual view sometimes set the wrong slip.
    - ▪ Iridas cube LUT not correctly loaded on the Mac
    - ▪ NVidia SDI RGB full/Range labels in the SDI configuration panel were switched.
    - ▪ Editor - splitting a shot would not split the versions in the slot.
    - ▪ Fixing issue with assemble of negative vari-speed events.
    - ▪ Fixing a number of issue with Stereo setup and stereo output on SDI.

- Build 741 (18 Dec '12)
    - o Dual-view/Over mode updates and quick key reassignment: d = toggle dual-view, s = toggle split view, s + shift = toggle trim view, a = toggle over mode. The 'Over mode' on the SDI is now enabled by default.
    - o Stereo setup was not available in SCRATCH Lab.
    - o Copy / paste (forward) of FX Ctrl values did not always work.
    - o Framing controls in the Editor did not update properly when animated
    - o Solved load delays and performance issues when using certain LUTs.
    - o Vari-speed offset from older project was not properly processed and offset could in some cases not be adjusted.
    - o Fixes on FC XML for media with different frame rate than the timeline and for processing zero length EDL BL-events.
    - o Locked timeline could still be updated in the editor.
    - o Compare mode was not working
    - o Link-views in the View Port is now enabled by default.
    - o Color blend mode on node was not persisted properly and alpha is set to 0 by default.
    - o The 'S' key to show / hide on shot-notes did not work properly in the Tray in the Player.
    - o Deleting a scaffold did not update the control state properly.
    - o The source-time in the editor for the shot's in- and out-point now shows the actual source-timecode.
    - o Scroll the construct and tray with the mouse-wheel.

- Build 739 (29 Nov '12)
    - o The Curves functionality was broken in the previous build
    - o Fixed an issue with slipping the media of a version and removed a limit on the length of a resolve.
    - o SCRATCH could potentially crash after a clean install when using an AJA card because settings were not properly initialized.
    - o Stereo update. Scaffolds where not properly rendered on top of a stereo node and framing was not always applied properly. To render out left and right eye separately without having to change the output node settings, you now can add an additional node at the top level next to the main output node. This node does however not include any tracks in a multi-layer timeline setup.

- o The HSV Qualifier did no produce proper results.
- Build 738 (23 Nov '12)
  - o AJA update: support for RGB 444 over a single 3Gb link as well as 1080p @ 50, 59.95 and 60 fps through dual link, 3G level A and 3G level B. When using a Kona cards, make sure you check your SDI settings after installing this update release.
  - o Default monitor color space transformation setting is now auto-apply.
  - o SCRATCH now exports graded proxies when using the auto-export or Custom Command export options.
  - o Unable to set keyframes for Scaffold vertices.
  - o Fixed an issue preventing SCRATCH to run properly on OS X 10.6.
- Build 737 (16 Nov '12)
  - o initial release

VERSION 7.0 [November 2012]

General Notes and <mark>Warnings</mark>

- This version requires a **license** update and re-activation of your license key. Reverting to a prior version will again require a reactivation of the license key.
- This version is not fully **compatible** with prior versions: projects created and graded in prior versions might come out different in this version and vice verse. Always check your project carefully after opening it in a different version. We do **NOT** recommend upgrading in the middle of a project.
- Please spend some time getting used to changes in the UI and new hot key layout before taking this version into production. Also, the new color space and monitor setting require special attention.
- As with every new version, make sure you made proper **back-ups** of all your SCRATCH project data.

Player Navigation

Updated Player navigation and drag and drop model to allow forworking seamlessly from a multi-layer timeline down to a single, multi-levelcomposite, while viewing the output in full context at all times.

- New **View Port Toolbar** to efficiently manage the View Port image for review and comparison (open link).
- Dual View **Slip Selector** to to independently the play left- and right view and visually set a slip value (open link).
- Updated **Over-Mode** with more flexible wipe function (open link).
- The Timeline Repeat Mode button also allows you to control the set the **Playback Speed** to 2x, 4x, 8x, 10x, 20x, 50x (open link).
- The new **Source-Mode** allows you to view the current shot including its handles while in the Player with the full timeline (open link and open this link).
- View **versions** in the context of the final output (open link).
- The **enhanced Drag / drop model** allows you to drop shots in the Layer stack or Structure view to replace elements while automatically re-wiring inputs when dropping plug-ins. You can also drop any shot in the right pane in dual view to compare shots drop. Scaffolds also automatically re-wires inputs in case plug-ins are used - allowing you to efficiently copy a Scaffold from one shot to a whole range of other shots (open link). Dragging a mask to the scaffold list will promote the mask to a scaffold (open link). The reverse is will happen when dragging a scaffold to the mask list.
- Added **Previous - Next navigation** buttons to the View Port Control bar for navigating a history list of selected shots on the timeline and inside composites (open link).

Edit / Conform

The SCRATCH Editor has undergone a facelift (open link)

- Enhanced drag / drop options for interactive editing (open link).
- A new **Editor-Overlay** in the View Port showing the previous and next shot in the timeline (open link).

- When switching to the new **Source-Mode**, the Editor allows you to directly adjust the timings of all your composites inputs (open link).
- The new **Flatten** function allows you to consolidate all sub-tracks into Scaffolds on the main track (open link). Lab
- Create a **Collector** node from shots spread over different tracks (open link).

Color and Composite Toolbox

- Better **Color Space** management with auto-transformations and support for the **ACES** color space. SCRATCH perform automatic transformations from one color space to the next (open link) and you can set a color space per output device / monitor (open link). You can manage the with each color spce related gamma at the project level (open link).
- View your scene and manage and animate camera positions in the new **3D Camera menu** (open link) together with the new View Port Perspective interface (open link). Lab
- New **Directional-blur** and **Multi-Sampling** for textures (open link) as well as **Motion Blur** with **MipMap Filtering** (open link) for smoother animations. With the new added controls the Texture menu has been changed with separate control sets for Front and Matte. Use the "+ Matte Transform" button to link both settings again (open link).
- Regarding Textures (open link):
    - o the Front section now has an Alpha (A) channel mask option to explicit enable embedded alpha, making an additional Matte assignment redundant
    - o shot assignment originating from the base shot's Staging area are referenced rather than first making a copy.
    - o the IN / OUT used references the actual in/out of the shot.
    - o in addition to Scaling you can also set the texture Rotation
- Additional **Tracker** functions; Selecting alternative source, setting offset for shape tracker and allow use of external tracker data from Mocha (open link).
- Easy **Nesting** of Scaffolds (open link).
- Per shot options for **Opacity**, usage of **Source Alpha** and **RGBA Transfer** modes, available from the Editor (open link) and the Input Transform menu in the Matrix (open link).
- Next to the existing RGB remapping options a new Alpha remapping (A=A,0,1) option was added to the Matrix Levels menu page (open link).
- **Paste options**. The Paste Forward function now stops at the mark out when a Range is set. In the Paste Dialog - selecting an option with Quick Key: Alt + click will disable all other selected options (open link).
- Additional Color features and changes:
    - o You can now use a **3D LUT** anywhere in the pipeline without restriction on your grade / curve usages.
    - o Support for **1D RAW LUTs** with .txt extension, like S-curve_for_CineStyle.txt from Technicolor.
    - o Added black/white offset changes to non-clipped 1D LUTs/Curves.
    - o Separate pivots are maintained for LIN and LOG settings (open link).
    - o Input Lin to Log and Log to Lin conversions now extend the full range and don't clip between 0-1.

Menu Updates

- **Settings menu** is now available from the pop-up menu in the Player (open link). Some of the Matrix configuration controls were also moved to this menu.
- The Settings menu has a separate **Monitor sub-menu** for setting display LUTs (open link).
- The **Stabilize** function was moved to the Source- Matrix page.
- The **Show Matte** option and color pod were moved to the Qualifier - Matrix page.
- A large number of key-board **Quick Keys** were updated. The Help panel in SCRATCH now contains tabs to browse through all quick keys (open link).

Project, System & Other

- Updates for Stereo setup (open link): Output any Stereo pattern directly to a monitor without having to add a plug-in (open link).
- New **Advanced-Setting dialog** to control Panels setup (open link), VCR configuration (open link), custom Formats and Aspect ratios (open link), manage Custom Controls (open link) and advanced System Settings (SConfig) (open link)
- Support for **HDMI** output for AJA Kona cards and AJA T-Tap.
- New AMT library and ability to output MXF **DNxHD 444** (open link).
- Separate Users and Projects folders for more flexible setup in multi-seat situations (open link).
- **Custom Commands** enhancements: export XML including proxies / LUTs, support for blocking calls and option to process results of a script rather than using the watch folder (open link) .
- Update on XML scripting - allow creating new projects (open link).
- Option to save a **RMD**-file for a r3d shot.

V6.1 UPDATE RELEASES

- Build 729 (8 Nov '12)
  - o Fixed an issue with adding shot references to the tray and an issue with the Media Browser.
- Build 728 (5 Oct '12)
  - o This build contains an update on the Sony F65 format implementation. In the previous build playback of F65 media had under certain conditions a performance issue, especially on OSX.
- Build 727 (8 Aug '12)
  - o **This build requires a reactivation of your current v6.1 license key**. No new key is required just use the Activate button with the existing key. Note that the system needs to be online when activating.
  - o New ARRI SDK with support for new debayering algorithms and support for color space ACES. The new version also includes a new notation "ARRI Debayer Algorithm" (ADA) for all debayer algorithms:
    - ADA-1 HW original camera hardware debayer algorithm,
    - ADA-2 SW advanced ARC/SDK software debayer algorithm (previously called AMC-1),
    - ADA-3 HW SUP 7.0 camera hardware debayer,
    - ADA-3 SW: SUP 7.0 advanced SDK software debayer algorithm.
  - o New Sony SDK which includes support for F64 HFR (high frame rate) and increased overall performance. Using a new SConfig-variable (SONYMXF_F65_DISABLE_OPENCL) allows to force CPU debayer rather than GPU debayer which in some cases provides better performance.
  - o Both ARRI and Sony F65 have specific requirements and issues regarding OS- and graphics driver versions. Please read this article for more information.
  - o High order filters were not always properly rendered pixel-aligned, causing jitter on animations
  - o Update on caching of audio meta data to be able to open the player faster.
  - o Update on SCRATCH Plug-in API (SPA).
- Build 723 (26 June '12)
  - o Update on Burn-in plug-in. In some cases text was displayed distorted. Also the alpha channel in included with text display was not adaptive.
  - o In some cases a LUT on a derived output node was applied twice.
  - o The No-Clipping option is now properly maintained for the selected Scaffold.
  - o Long file names were not always refreshed properly in the info bar in the Player.
  - o Another update for Neat plug-in to properly work in combination with using SDI.
  - o Added Quick Key - 'W' for toggling project tree panel in the CONstruct.
  - o Added option to escape wildcard character in the search dialog: use 'x/yz*' to search for literal text 'x*yz*'.

- Build 722 (13 June '12)
  - OFX plug-in interface update - among others, fixing an issue with Neat Video which was not properly working in combination with SDI.
  - Embedded alpha in source Fill-texture can now be enabled and no longer has to be copied to the Matte-texture. Also, alpha is passed properly to (OFX) plug-ins.
  - Scaffold blur and alpha were not properly copy / pasted.
  - Bug fix on reading AIFF files that could cause channel swapping.
  - Update on AAF assembler. The From-Folder option could in some cases crash the application. Also, the timecode of a shot was in some cases not parsed properly when reading an AAF file coming from AVID MC.
  - Update on ALE export which now including all audio channel references rather than just the first two channels.
  - Media long file names containing only numeric characters were not always parsed correct.
  - Fixing an issue with updating the ReelID of shots in the Media Browser that could crash the application.
- Build 721 (9 May '12)
  - Solved issue with selecting a reference shot while in dual view.
  - Solved issue with range settings when entering the Player with a single shot.
  - Adjusted default file mask for new Broadcast Wave Writer.
- Build 720 (2 May '12)
  - Update on Sony F65 support; new implementation including additional Source Transform option and new defaults, audio support, auto processing of CDL data and support for F65 Lt media. Please see the Sony paragraph for a more complete description of the new setup.
  - New Metadata stack in the Player. Next to the Version, Layer and Staging stack a new panel is added for displaying and editing the metadata of the current shot in the Player. Please see the Metadata Stack paragraph for more information.
  - We replaced the Shot Name - input mask in the Media Browser with a more generic setup to update the name, reel-id, scene or take properties of a shot using a mask. Please see the Media Browser paragraph for more information on the Input Mask.
  - We added the option to copy/paste FX Ctrls values from one shot to the other. The Paste Dialog now includes the option to also paste FX Ctrl settings to a single or range of shots (using Paste FWD function). Please see the Paste Dialog paragraph for more information on this feature.
  - Drag & drop update; added the option to drag nodes from the tray in the player and drop shots onto the current shot in the View Port to copy a grade. For more information please see pasting grades paragraph and the Trays paragraph on dragging shots from a tray.
  - New Broadcast Wave Writer plug-in that allows you to write separate audio files. Please have a at the BCW paragraph more information.
  - Update on audio-sync function; when using Ctrl+Click to find the next audio peak - SCRATCH will slip video in-point rather than audio slip. Please see the Audio Slip paragraph for more information.
  - Added framing animation and opacity data in an XML import / export. Please see the Appendix for more information on XML scripting and import/export. Also, see the paragraph on Import and Export of Animation data for more information on the data formatting in the XML. Furthermore, note that the timeout for checking for updates in the init-xml folder of a project was changed from 30 to every 5 seconds.
  - Fix on processing ASC CDL data from an ALE - in previous versions not all decimals were processed. Also, on export CDL data the master value is included with the rgb components for pre-gain, offset and gamma.
  - Properly include empty slots that with length as BL events in an EDL export.
  - Fix on timeline timing when using a re-timer / pull-down; the re-timing would not properly ripple through in the display of the timeline and in the render when writing to a folder per slot.
- Build 717 (28 Mar '12)

- Sony F65 - implemented the new Sony SLog2 gamma curve. As of this build F65 footage by default are set to the R.BT709/sRGB Color Space and using the SLog2 input remapping in the Source Transform of the Matrix. *About the current Sony F65 implementation - we get a lot of questions about comparing the image in SCRATCH to that in the Sony Viewer. The SLog2 implementation is identical to that in the Sony Viewer. SCRATCH has a different Rec709 gamma curve implementation (in the Source Transform) than the Sony viewer. Using the SCRATCH grading functions you are able to create a similar image as the Viewer if desired. Alternatively - on request, we have a LUT available that mimics the Sony viewer one-on-one; however that clips the image leaving very little dynamic range for further grading and is not a recommended workflow.*
  - In some cases after Loading footage and doing a conform to a new construct the shots on the initial CONstruct where not saved.
- Build 716 (9 Mar '12)
  - New RED SDK with new RED colors paces.
  - Sony F65 and SR support: when enabling the *SONYMXF_ENABLE_AUDIO* SConfig variable SCRATCH will also process the audio in the mxf file. Note that this is still beta functionality and you might experience issues when in the Edit module and shuttling through the timeline while audio is enabled. These issues should not occur in normal playback / renders.
  - Support for .cube 3D LUTs
  - More precise message when using file mask that does not produce unique file names.
- Build 714 (1 Mar '12)
  - Support for **Sony F65 and SR - formats**. Please see the [Sony paragraph](#) in the User Guide for more information. Also note that currently audio is not supported for these formats.
  - New **ARRI SDK**, allowing for GPU debayer. As far as the GPU debayer this is still a beta version and to use it rather than regular CPU decoding you need to explicitly set the 'ARRI_USE_GPU' variable in the SConfig file. For Windows a Quadro 5000 or 6000 card is recommended and for the Mac a Quadro 4000 - though the performance gains are less than on a Windows system. Please see the [ARRI paragraph](#) in the User Guide for more information. Also, please refer to the [driver chard](#) for recommended drivers to use.
  - Added Color Space and Debayer Mode options to ARRI Process menu controls and any in the media included LUT / ARRI Look data is now properly processed.
  - Updated AJA Mac SDK to version 3.2 - this now requires driver 10.1.
  - Added default mapping files for the new Tangent Element panels. Please see elsewhere in this article for more info and links on the use of this panel.
  - A Log to Lin + Gamma conversion in source transform did not maintain the proper black level; this fix might affect existing setups when doing a Log to Lin transform and a Gamma adjustment in the source transform.
  - The Log to Lin Display LUT does no longer include an automatic device-gamma adjustment.
  - The #sframe hash code for the file naming scheme did not always return the proper value.
  - Fixed an issue with Tracker when using file formats with different than expected endianess.
  - The backspace on selected text was not working properly.
  - The Scene and Take properties of a shot could end up twice in an ALE or XML export.
- Build 709 (7 Feb '12)
  - This build includes a new RED SDK that solves a bug giving black frames when using HDRX in certain resolutions. However - there is still an issue that for certain resolution the Red rockets aligns the image incorrect resulting in a 1 pixel black line appearing on the right of the image. This issue is known with RED and is expected to be resolved with the next firmware upgrade.
  - Fix for a performance issue when a r3d shot was used as a texture.
  - Fix for a performance issue with copying image data to the graphics card while in dual view or a stereo setup.

- This build ignores so called *dead keys* on certain international keyboards as they were crashing the application (OS X) .
- The remote module was not working properly.
- Added a new 'Alt' group text for panel mappings.
- Statistics where sometimes calculated after the display LUT was applied.

- Build 707 (19 Jan '12)
  - Solves an issue with the Statistics Waveform with FX Quadro 5800 cards.
  - SCRATCH will now automatically calculate a slip value when loading and linking a (Broadcast Wave) audio file to a shot from the Edit menu in the Player. A sample-rate override (48048 rather than 48k) is automatically applied for calculating the slip in case of a shot with a 23.976 framerate. This same override is also applied by default in the Media Browser - independent of the override ht user can set manually.
  - Toggling the visibility of a note (using the 'S' key) of a selected shot will will also toggle all other selected notes. This way you can quickly show/ hide notes on the entire timeline.
  - Updating the Color Pivot defaults was not working properly.
- Build 706 (13 Jan '12)
  - The default extrapolation mode for animations was reverted back from Linear to Constant.
  - Final Cut XML was not always properly decoding a clip's timecode.

VERSION 6.1 [December 2011]

- **Note:** this version requires a **<u>new license</u>**. New license are only issued by sending you a license-key to activate or re-activate your existing license key. Please see Licensing the Software in the User Guide about license key activation. Switching (back) between this version and v6.0 requires a re-activation on each switch.

- **Warning:** in this version important changes in handling r3d media are implemented which make it *not backward compatible with previous versions*. Please read and consider the notes below carefully.

- **Note:** not all new features are available in SCRATCH Lab. Both in the User Guide and in these release notes - Lab - is used if a feature is only available in SCRATCH**®**.

SDI

- Support for the **AJA Kona SDI** boards (output only) both on OS X and Windows. Please see System Settings - SDI in the User Guide for more details. Note that for the AJA Kona cards to work you need the latest drivers which are available at the AJA website at www.aja.com/support. The latest Beta build requires Kona driver 10.0.1. Also, we are working on support of for the **Bluefish Epoch** card - but testing has not finished with the release of this version.

PROJECT, MEDIA AND CONFORM

- **RED r3d** media - Please see the RED paragraph in the User Guide.
  - You can now set the target resolution per node and if using a Red Rocket - scaling is done on the card which greatly improves decoding performance. By default SCRATCH will set the target resolution of an r3d clip to the project resolution.
  - Note that this new setup is NOT compatible with previous versions; once you load an existing project into this version you will lost the original settings. Vice verse - a project created in this version will not maintain its settings when loaded in an older version.
  - New RED-SDK with new options for processing HDRx. The Red Rocket requires driver 1.4.19.0 and firmware 1.1.16.5 both available on the RED website.
- Update on **AAF/XML** assemble- Please see the Conforming paragraph in the User Guide.
  - New **Reverse-Assemble** for AAF/XML.
  - Option to include multiple matches in an assemble.

- Inputs of non-supported effects are included in the assemble. You can include additional inputs either in the Version stack or in the Staging area of the main input shot.
    - The **Match from Folder** - option also matches the name-property of the event with the file-name. In addition you can set the media type to search for - which increases the efficiency and performance of the match routine.
    - New option to import **Meta Data** from the AAF file into a matched clip.
- **Meta Data** handling to facilitate specific workflows - Please see the Media Browser in the User Guide.
    - New **Scene** and **Take** properties per shot; editable in the Media Browser and included in ALE and XML import / export.
    - Allow for automatic overwriting of Shot Scene and Take properties when loading / linking a Broadcast Wave (**BCW**) audio file.
    - New option in the Media Browser to update the name of all selected clips using a **naming-mask** with available #codes.
    - The **#reelid**[n] code was extended with a parameter in order to return only the first n-number of characters of the shot's reel-id.
    - When exporting AVID **MXF** all extended meta data items are included in the rendered MXF/AAF.
    - The **In / Out Points** now displays absolute frame positions and an (additional) media length column. The **+In / +Out** controls now add or subtract the actual number of frames rather than previously re-calculate the values to increase / decrease the handles of a shot.
- Plug-in updates.
    - **Stereo** node update - Please see the Stereo node in the User Guide. Added a **Frame Sequential** mode; this will output alternate left / right frames rather than a single stereo pattern frame.
    - **Burn-in** update - Please see the Burn-in node in the User Guide. A new **Flash Frame** - option; when enabled only the first and last 'n' number of frames of each shot will have the burn-in text. Rendering Guides can be optionally linked to the display of flash frames.
    - New **Re-Timer** plug-in - Please see the Re-Timer node in the User Guide. The Rolling Mix - mode of this node does an interpolation of frames on a slow motion and will do a merge of frames on a speed up.
- CONstruct Tools - Please see the Media menu in the User Guide.
    - Reshuffle of functions with the Commands Menu to create space for new tools.
    - **Generate TC** function to generate a new time-code for all shots on the timeline in the CONstruct, given a start time-code and an interval.
    - The **Stereo Setup** function will create Stereo Nodes for all left Left/Right pairs on the CONstruct.
    - **Match TC** function that adjusts the in-point of all second versions (right eyes) so that the timecode matches the timeline version (left eye).
    - **De-Construct** function that transforms the current (conformed) CONstruct to a stripped version by removing duplicate clips, adding handles and fixed gaps in order to render or play-out the CONstruct more efficiently.
- Added **#codes**: #seq_frame which translates to 'left' / ' right' and can be used with Stereo nodes. #keycode which translates to the keycode of the source image. Please see the Output paragraph in the User Guide.

COLOR GRADING AND COMPOSITING

- New **Enhanced Levels** noise function in the Matrix Source tab than implements an overall error compensation scheme for all grades. Please see the Source Transform paragraph in the User Guide. Note that setting this to a high value might - depending on your grade lead to a too 'obvious' noise pattern.
- Automatically **rescale** the Scaffold canvas/transform when applied on a different target.
- Update on **OFX** plug-in interface for faster processing of image effects by sharing data between host and plug-in on the GFX.

- **Tracker** is now available for masks as well. Please see [Masks paragraph](#) in the User Guide.

- The **No Clipping** option is now active by default and its state ripples through when creating Scaffolds. Please see the [Source Transform paragraph](#) in the User Guide.

- Added option to load and render **Scalable Vector Graphics** (SVG) files. You can load an SVG file in the Matrix where it will show as a scaffold. Please see the [Texture paragraph](#) in the User Guide.
    - Note that this functionality is only available on NVIDIA Fermi cards on Windows.

SYSTEM - SCRIPTING, SPA

- Update on **Custom Commands** settings that now offer the option to an xml file with data of all selected shots(and optionally a LUT per selected shot. Please see [Custom Commands](#) in the User Guide.

- Added Staging Area items to **XML export/import**. Please see [XML Scripting](#) in the User Guide. Note that only items that were explicitly added to Staging are included - not all items used in a composite.

- Update of SCRATCH PLUG-IN API (SPA) for developing SCRATCH plug-ins.

Other Features and Fixes

- Added support for the **Tangent TUBE API** with supports for the new **Element** panels. Please see [Controls Surfaces](#) in the User Guide. Note that default mappings for the Element panels are not yet available on the first release of this version. For the panels to work you need firmware version 1.15 and Tangent HUB software version 0.1.3, revision 2.

- Added a **Select All** function in the Search dialog to select all clips found on the current CONstruct. Please see the [Search panel](#) in the User Guide.

- Added work around for NVIDIA dual screen bug when using HDMI as second screen; Enabling the SConfig variable NV_DUALHEAD_BUG invoke the work-around.

- New version of the AVID AMT library available for rendering AVID compatible DNxHD MXF from SCRATCH. Please [download the library from here](#).

VERSION 6.0 [July 2011]

- **Warning:** Projects loaded in 6.0 might not appear the same when loaded back in v5.2. The setup of the **Hue-Hue curve** in the Matrix has been updated and is not always backward compatible.

- When opening a v5.x project this version you must **Upgrade** the Project Database. After upgrading you still can load the database in a v5.x version of SCRATCH but settings and grades might differ or be lost.

LICENSING & INTRO SCREEN

- SCRATCH has a new License scheme with two products; SCRATCH® - the full version and SCRATCH Lab™. Please see the [Products Features Difference Matrix](#) paragraph in the User Guide for the difference between the products.

- The ways you handle license files has changed in the version. Rather than copying a license file to the settings folder you load the license in the License Dialog of the Start-up Screen of SCRATCH. Please see the [Licensing the Software](#) paragraph in the User Guide.

MAC OS X VERSION

- Both SCRATCH® and SCRATCH Lab™ are also available on OS X.

MULTI LAYER TIMELINE

- Added a Multi-Layer Timeline (MLT) context to be able to overcome the slot-boundaries of a CONstruct.

- The MLT is implemented using sub-CONstructs and layers on the Main Output node.

- The Editor was extended with a Tracks view.

- To be able to easily navigate through the shots of the different Tracks, the Player navigation was updated.

STAGING, LAYER STACK AND STRUCTURE VIEW

- To improve organization, manageability and navigation through complex compositions:
    - a new Staging module as an extra data-management dimension to the CONstruct.
    - the Layer Stack and Structure View - composite tree view.

AAF / XML CONFORM

- Added support for conforming from AAF or Final Cut XML.

- SCRATCH supports conforming multiple tracks and most of the basic effects used: Dissolves and Fades, Vari-Speed, Flip/Flops and scaling.

- Next to Matching edit event to already loaded media, you can now also match the events with the media in an disk folder based on file-name.

MEDIA FORMATS

- **Codecs Support Pack** (CSP) - offers native support for; Phantom .cine, Cinema DNG, Panasonic P2 (DV, DV50, DVHD, AVCi50, AVCi100), Sony XDCam (4:2:0 & 4:2:2), MOV and AVI (Cineform Si2, DPX-C), AVCHD. Currently CSP is available as a separate downloads.

- RED r3d media.

    o As of this version the SCRATCH software decoding of r3d is no longer available for new projects, only RED's own SDK decoding which can also be used in combination with a Red rocket acceleration card. The S-RED 12, S-RED 16 and Native color mode settings for R3D files are all disabled; existing projects using these settings will continue to use them but once changed you will not be able to switch back.

    o Additional 1/8 proxy mode for better play-back performance when no accelerator card is available.

    o New option to adjust the ReelID for r3d footage to one of four formats: A001, A001C001, A00131XX, A001_C001_1231XX. You can set the format on the General tab of the FX Ctrls menu in the Player. Note that the setting is a project-wide setting and is applied to all RED shots, unless the ReelID of the shot has been altered manually before.

- Support for the **ARRI-raw** format, using the ARRI SDK for debayer and collorimetry. The current implementation allows you to adjust the ISO and RGB channel gains used for decoding the image.

- **QuickTime** - Additional controls for color tagging and conversion for rendering QuickTime files.

- **Tiff** - now writes alpha as either UNSPECIFIED, ASSOCALPHA (pre-multiplied) or UNASSALPHA. Also added **Tiff** tags for TimeCodes and FrameRate according to the 'CinemaDNG spec' and reading/writing the 'reel id' from/into the Image header. Tiff now preserves the same metadata as DPX.

- Writing alpha is now controlled through UI options per node by selecting the **RGB or RGBA** mode.

- Added **Range control** (Video/Full) to MXF DNxHD node and using generic YUV->RGB conversion functions to prevent a color shift in AVID when loading / viewing SCRATCH generated MXF files.

- Improved performance of handling EXR footage.

THE MATRIX

- Next to the points trackers SCRATCH now also offers a **Shape Tracker** - allowing you to track any Scaffold created, including transformation and deformation of the shape - which can be controlled separately.

- New **Masks** sub-menu where you can create multiple shapes inside a Scaffold to add an alpha channel for masking areas / cutting holes in the parent Scaffold. These shapes should be viewed as a qualifier for your composite but based on 2D geometry instead of keying.

- Additional Qualifiers and keyer features.

    o New **Luminance Keyer** using curve control to set value and slope of the qualifier.

    o New **Chroma Keyer** - using differences in chromatics, primarily targeting blue/green-screen shots.

    o New **Vector Keyer**, treating colors as vectors in 3D RGB cube and defining a cone shape vector limited by shadow and highlight range and allowing for additional softness to all outer edges of the key.

    o **Spill Suppression**. This option defines a color range around the key color and uses one of three methods for adjusting colors: Recover, Desaturate or Color.

    o New **Expand / Shrink** function to expand or shrink the matte generated by a qualifier.

    o New **area select** - when holding down the Ctrl-key you can select an area which is used to set the initial values for a Qualifier or when the **C** or **S** buttons are enabled adds or subtracts the selected range to the Qualifier.

- o Added panel mappings for all the keyer controls.
- Added new basic **'Bicubic' surface** as a primitive for a Scaffold. Note that for the best results this function requires OpenGL 4.0 and support for tesselation shaders, which is available on the new generation of Quadro cards.
- Optimized the **Softness algorithm** used in SCRATCH; existing softness settings might render slightly different.
- **Hue-Hue curve** now has a relative shift to ensure the end points are symmetric.
- Added Matrix option "**No Clipping**" in the Source Transform. With this Switch you control whether the Curve controls will or will not clip the shot.
- Extended support for different flavors of **CDL**.

VECTOR PAINT

- New module providing **vector paint** functionality (This replaces the **Scratcher** plug-in which is no longer available).
  - o Defining, editing, saving and loading color palettes and brushes.
  - o Different paint modes - Copy, Clone and Reveal - and option to paint in specific color channels RGBA.

AUDIO

- New **Wave Form display** in the Editor.
- New **Audio Mixer Panel** in Player; volume control per volume, separate settings for playback and play-out, channel mapping, automatic **peak/clapper-detection**.
- **SDI Embedded Audio**. 'SDI Embedded Audio' is presented as a separate audio device when using the new generation of Quadro cards with SDI - Requires NVIDIA Quadro 4000/5000/6000.

XML SCRIPTING

- To ensure consistent **order of processing** the files in the XML / watch folder are now always processed based on the file's modified-date.
- Allow for a **substitute path variables** in XML - using $MEDIA$ to refer to the media path of a project or use $IMPORT$ to refer to the path of the XML that is being processed. Please see Appendix C of the User Guide.

OTHER

- Menu update and reshuffle. **LUT and Guides menus** are now available as sub-menus of the Settings menu in the Player. The LUT menu does no longer provide the option to set a Monitor LUT to be set on the operating system level as this is not possible with Windows 7 or OS X. Alternative some graphics card drivers settings allow you to implement a custom LUT. Note that you can still apply a display LUT for both the primary and secondary display. The Guides you set in the Settings - Guides sub-menu now represent settings for the CONstruct you are working on; the guides are displayed in the Player and included in SDI for Play-out but not when rendring to file. The Burn-in meta data option has been removed in favor of a solution of using a plug-in. In addition, the **burn-in Grade** option has been removed. All Output nodes now by default have their grade rendered.
- Renaming the **Text-Frame** to **Burn-In** and extending the plug-in with the option to burn in **guides**. There where the Guides sub menu in Settings represent CONstruct settings - this plug-in can be added to an Output node (or used in an Output Template) to actually burn-in meta data and guides.
- **SDI** (and dual-view) setup now explicitly configurable through the UI.
- Allow the CONstruct to **scroll** without holding down the Space bar.
- Removed the '+Grade' and '+Framing' from the **Plugins Browser**; input-color processing is now always enabled.
- **Search Panel**; When executing a Search, references of all shots found are added to a temporary CONstruct, which can be viewed in the Player.
- **Improved performance** rendering shapes.
- **ANC data** on SDI is now enabled by default. Also, the VITC/LTC timecode is now also placed in the in HANC lines for Playout to VCR.
- **Play-out** now automatically switches to EE when in STOP mode only and disables EE when there is any activity on the VCR.

- Support for the AVID **Euphoix MC Color** surface panel.
- UI taking better advantage of high resolution displays (2560x1440).

VERSION 5.2 [NOVEMBER 2010]

IMPORTANT!

- v5.2 is **NOT** fully compatible with previous versions; Loading a 5.2 project back into a previous version might cause loss of data.

RED

- This version includes the latest official released **RED SDK** and requires *driver version* 1.3.3.0 and *firmware version* 1.1.8.6.
- RED **Settings are maintained per Shot** rather than per Track as in previous version. Multiple shots pointing to the same physical file can have their own RED decode color and gamma settings.
- The Media Browser allows for **updating** the RED settings for **multiple shots** at once.
- Added **RedLogFilm** gamma option.

PROJECT / OUTPUT

- **Broadcast Wave support**. The new audio-tab in the Media Browser also contains a new function to match (broadcast) audio files with shots, based on the time-code of the audio file and the shot. The match function allows you to select a folder containing audio files of which the time-codes are read and matched with the (selected) shots in the Media Browser. If the time-code (plus the length) of the audio file overlaps the time-code (plus the length) of the shot, the two are length. Additionally a slip value for the audio is calculated. The slip value can be adjusted manually afterwards for all shots if needed. To be able to calculate a correct match, you must set the actual sample rate on which the time-code of the audio file is based (NTSC).

- **Project Consolidate**. This function allows you to copy/move all used physical media to a new media folder or to just copy/move any media external to the media folder into the project's media folder. Note that the Consolidate process might be a lengthy process and that during the process you cannot enter the project. You can pause the process and enter any other project and you can abort a Consolidation all together. However, aborting a consolidate may result in some cases in invalid media references. Before aborting SCRATCH will ask to finish Consolidating the current shot to minimize the change of invalid data references. The Consolidate functions writes to a separate consolidate log file in the Project folder. The Consolidate function is available in the Project Settings panel in the Logon screen. Because the consolidate can have far reaching consequences, you can remove the option for all users by setting the "AS_CONSOLIDATE = FALSE" parameter in the SConfig file.

- Option to create a new **Collector node** from a selection on the CONstruct. A collector node can be viewed of as a timeline-in-a-node. When entering the Player with a Collector node, the **Edit module** allows you to change the edits of the underlying nodes or add / remove shots from the Collector node. With this functionality, the Collector node adds another dimension to the CONstruct. The node-type is recognizable by the mini-timeline that is displayed in the top-bar to the proxy-image. Creating a Collector node is simply done by selecting one or more shots in the CONstruct and using the Create Collector button in the Media menu. With this button two options are available. Enabling "**C**" will also remove all the slots of the selected shots that are inserted in the Collector. Any versions of the shot will be moved to the new Collector shot. This option is only available when the selection consists of consecutive shots on the Timeline layer. The "**+T**" option forces the addition of slot transition info to the Collector node, even if the shot selection is not on the Timeline. When selecting a single Collector node on the CONstruct, you can also **expand** it again, creating copies of all the underlying nodes.

- Additional **#eventpos** and **#colorspace** field codes for the **file-naming scheme**. The codes translate to respectively the absolute frame position within a slot and the color space of the shot (lin, log, xyz). In addition, the file-naming scheme restrictions where loosened; SCRATCH will no longer generate an error when the file-mask set will overwrite any previous rendered data. SCRATCH will still generate an error when using a file-mask that results in non-unique filenames within a single output. To make the use of file-masks easier, 3 default template masks are added that can be used and will always result in a unique file sequence..

- New **Custom Command Control interface** which uses an xml settings file and allows you, next to launching third party software & scripts directly from SCRATCH, also to launch a plug-in directly from the CONstruct (optionally including preset values) or opening a web-page (incl. providing meta data on the shot to the web server). In addition, the XML also allows for setting a default plug-in for a second monitor (SDI or Second Head). Please see Chapter 11 - Customizing SCRATCH of the user guide for more details and the formatting of the xml.

- New **Stereo Plug-In** which takes two inputs and processes them into one of the available stereo patters; *Side by side*, *Over/under*, *Line interleave*, *Checkerboard* and *Anaglyph*. The plug-in can be applied directly on a node, on an output node in the Pipeline view (where it will automatically select its second input and display that by a dotted line) or, using the new Custom Command XML interface, you can use the plug-in on the second monitor, where it automatically will take Layer 2 of the CONstruct as its second input. Please read more about this option in Chapter 11 - Customizing SCRATCH of the user guide.

- Additional (default) column in an ALE and new tags in XML to **Import / Export Audio time-codes**.

- Support for rendering **8 and 16-bit dpx**, both RGB and RGBA.

PLAYER / MATRIX / PROCESS

- SDI output produces **ANC data** (VANC) with the following fields set: VITC/LTC Timecode -> Timecode of the current shot, Film Timecode -> Source Timecode of the current shot, Production Timecode - Record Timecode. This function requires NVIDIA drivers version 197.90 or newer.

- A new **Stereo Lock** mode option in the Player Settings panel [**S.Lock**] which, when enabled, locks the left/right channels in a dual view setup. Selecting the right eye in the version stack will then maintain right-left view and you are editing on the right view of the dual view. Selecting another shot in the Version stack will automatically select a new Stereo (version) pair. Note though, that you cannot combine this function with selecting a Reference in the dual view as that would break the stereo effect.

- **Tracker update**, improving accuracy and an option to edit the offset by holding down 'shift' while re-positioning the track-box.

- Improved quality and performance of the **rescale function**.

- Support for **8 additional audio-channels**.

- New **A.Relative** option in the Paste-dialog, which will paste any copied Animation Channels relative to the in-point of the shot. Also, the Animation Editor has a new option to re-align the animation with start of the slot / the in-point of the shot.

- Additional **panel mappings** for navigating key-frames.

- View position and scaling - **Player settings** are now stored in the database per CONstruct and restored when entering the Player.

- The **Overlays** of plug-ins are now available when in the FX Ctrl menu inside the Matrix.

- **Dock-able Scaffold panel** the left side of the screen. The default size of the Scaffold list is increased and when dragging the panel to the left of the screen it will dock and behave the same as the Project stack and shot-stacks.

GENERAL UPDATES & FIXES

- Audio icon on **proxy-image**, indicating presence of audio; a white icon represents media-embedded audio while a colored icon represents a separate linked audio file.

- Update on **dissolves**; in a new project a dissolve now always start at the first frame rather than frame+1.

- Clicking the **Snapshot** button in the Player while holding Control key will ask for a filename. By default the filename now includes the name of the CONstruct and shot.

- Fix on the **Create Version** if files are rendered out over multiple folders. The function now moves the underlying media to a new folder, loads all individual shots and create a new Collector node.

- Update on **File Browser** - improved performance and more responsive with large folders. The File browser also shows available drive labels / UNC paths with all the drives listed in the top left panel.

- The **Paste Grade** function now takes slot-length into account to find the best match. Also, the Copy Grade is only applied to the selected shots on the CONstruct, unless none are selected; in that case all shots are processed. This way you can apply the function quickly to only a second layer or version.

- Typing project name in the Logon screen auto-scrolls the project list.

- An new panel-id was added to the default cs_devices file and used in the mappings file, which enabled that you can have different panel configurations on multiple systems while using the same panel-mappings file.

- If you change a value in any text control within SCRATCH it will remember that value. So when you are next in a text control you can press the up-cursor key and scroll through any previously remembered values. The history is maintained until exiting the project.

VERSION 5.1 [JULY 2010]

IMPORTANT!

- v5.1 is **NOT fully backwards compatible**. Projects created or once opened in v5.1 will not always load properly in a previous version of SCRATCH. Also, **Play-out** settings in the pconfig file might need adjustments for this new version, which might take some extra setup time.

RED

This version includes the latest official released **RED SDK** to enable processing footage shot with the new MX sensor. The new version also enables the use of **multiple Red Rocket** decoder accelerator cards, especially useful in a Stereo Workflow. In case of stereo footage, SCRATCH also interprets the flip/flop meta settings of an r3d file and copies them to the new flip/flop option in the Source Transform of the SCRATCH color pipeline. The new RED setup in the Process-FX Ctrl menu panel in the Player in SCRATCH is spread out over 2 menu-tabs: General and Color. It is very important to note that:

- the decoder settings on the General tab are still **global** and apply to all r3d footage in the project
- the red color transform setup in the Color tab apply to a **single r3d file**; all (copies of) shots that refer to the same physical file *share the same transform settings!*
- if you are using a Red Rocket harware card, v5.1 requires an upgrade of both the **driver** to version **1.3.2.0** and **firmware** to version **1.1.8.6**; available from the RED website www.red.com.

The new Color tab contains additional controls for the RED decode and color transformation. Note though that this transformation is done outside the SCRATCH color pipeline. Please read more about the RED implementation in Chapter 9 - Output and Plug-ins of the SCRATCH User Guide.

COLOR

The setup of the Color Pipeline has been updated to further improve performance. A number of new features are implemented

Qualifiers & Keyer

The Qualifier interface offers a new **Source Selection** option to set the level the Keyer is applied to:

- Source Image; the base image without any grade
- Primary; the base including the primary grade.
- Recursive; the image including all grading and any (underlying) Scaffolds.
- The Fill or Matte used in the Scaffold

On the left top side of the Qualifier menu, two new View buttons are added: **Source** and **Matte**. The first shows the image used by the Keyer as selected in the Source Selection to actually see what color you are picking, the second shows the matte of the Key. To actually pick a color you must use Ctrl+Click.

Other new features

- New **Grading Memory buttons** in the Matrix to store grades. With Shift+Click the grade of the current shot is stored in Memory. Clicking the button applies the stored grade on the current shot. You can map the memory on a panel to Map-1. The Memories are stored as user settings so are not restricted to a single project.
- The Curves menus show the **full histogram** as background
- Moved the **Framing options** to the Matrix for easier access
- New **re-sampling** algorithm for more accurate LUTs

PROJECT & OUTPUT

SUPPORTING THE MXF FORMAT

The new version supports both playback and rendering of the (AVID) **DNxHD MXF format**. For rendering MXF format SCRATCH uses the AVID AMT library. Shots are rendered to singleton an MXF file with accompanying AAF and XML files containing meta data. The functionality to render out MXF is packaged in a separate installation which is available at the bottom of this page. The procedure to render out MXF is similar to rendering out footage in a QuickTime format; add a MXF node to an Output node, set the appropriate encoding options and start processing the node.

FILE-NAMING SCHEME

The file-naming scheme in this latest version has been enhanced and extended. The number of codes that can be used in the file-mask are increased and the dialog to create the mask now also has the option to create and load preset masks. Most of the codes can also be used in the new Text-Frame plug-in which is explained further down, while some codes are exclusively for file-naming or for the Text-frame. The list below contains all available codes.

- #reelid - Reel ID of the input.
- #name - Name of the shot.
- #sname - Name of the source shot.
- #file - Filename of the shot (excluding extension). (Text-Frame only)
- #sfile - Filename of the source shot (excluding extension).
- #note - Annotation stored with the shot. (Text-Frame only)
- #snote - Annotation stored with the source shot. (Text-Frame only)
- #tc[0] - Timecode of the shot.
- #stc[0] - Timecode of the source shot (only applicable to filenaming scheme).
- #rtc - Record timecode. (Text-Frame only)
- #frame[6,0] - Frame number of the shot.
- #sframe[6,0] - Frame number of the source shot.
- #eventno[3,1] - The source event/shot number. (File-naming only)
- #date[ymd] - The current system date.
- #slotname - Name of the slot. (File-naming only)
- #spath - Path of the source shot excluding media folder or drive-letter but including last folder separator.
- #fps - The frame rate of the shot in frames-per-second.
- #res - Resolution of the output eg. 1920x1080.
- #ext - The default filename extension for the output format. (File-naming only)
- #project - Name of the project in which the output resides. (File-naming only)
- #group - Name of the group in which the output resides. (File-naming only)
- #construct - Name of the construct in which the output resides. (File-naming only)
- #md[a] - Meta-data description. (Text-Frame only)
- #subtitle - The subtitle(s) at the current time. (Text-Frame only)

The new file-naming dialog automatically pops-up when selecting the file-name textbox in the configuration panel of an Output node. Through the Code - optionslist button you can select any of the available coes for inserting in the file-maks. By typing one or more '\' (backslash) in the maks directly you can create a custom folder structure. On exiting the dialog, SCRATCH will validate the file-mask and in case that will lead to duplicate file-names within the project, issue an error. The presets that are saved in the pop-up dialog are stored in the FileMasks.cfg file in the c:\programdata\assimilate\settings folder.

PLAY-OUT

The Play-Out module has been updated to get stricter timings. Also:

- A new **Crash-mode**, next to Insert and Assemble, which disables cueing the VCR to a specific point and instead starts recording right after obtaining a servo-lock.
- Use CTRL+Connect on the Play-out menu to switch to **Emulate-mode**. This mode makes Play-out available but without the VCR control. When pressing Record in Emulate-mode, a normal Play-out run is performed but without actually activating the VCR. This mode can be used for testing, reviews or audio sync on SDI. One option is e.g. sync audio to SDI without adjusting the slip (during user-sessions).
- A new parameter '**prst_init**' can be used in the **PConfig** settings file. This parameter is used to set the initial offset on the time-code generator of the VCR for an Assemble. In certain cases the first frame needs a different offset than all the other time-code changes in the timeline that is being recorded.

Note that using this new version might mean that you have to adjust your current VCR settings in the pconfig.xml in the c:\programdata\assimilate\settings folder!

The NVIDIA graphics driver version used on a system is a major determinant for the performance of Play-Out. Test results for the 197.90 drivers have shown good results. The driver is available on the NVIDIA website.

META-DATA HANDLING, ALE IMPORT AND CDL SUPPORT

SCRATCH can now maintain an unlimited list of name-value pairs per shot. This meta-data is shown in the new 'Extended Properties' tab of the shot Info-panel (Quick Key - I while hovering over proxy image).

- each shot in SCRATCH **inherits** the meta-data from its main input, so all meta-data is preserved up to the final output.

- meta-data can be updated through the shot Info-panel, XML scripting or with the new ALE Import Manager.

The new **ALE Import Manager** offers a flexible way to set up matching criteria and include / exclude columns from importing. In the second row of the ALE Manager's data grid you can select the function of a column: use for matching, import or exclude. The matching algorithm and procedure is similar to that of the EDL Manager. You can either just import the meta data or also Assemble a new Timeline from the matches found. You can change the default settings by updating the AleDefaults.xml file in the c:\programdata\assimilate\settings folder, created after using the ALE Manager the first time.

ASC-CDL SUPPORT

Both ELD and ALE import / export can now include and handle ASC CDL parameter. The formatting in the EDL / ALE is in line with the *'ASC CDL Avid Workflow'* specification. Note though that if CDL compatibility is required only a limited set of grading parameters should be used in SCRATCH. The ASC CDL parameter mapping is implemented as follows:

ASC CDL -> SCRATCH
Slope -> Pre-Gain (r,g,b)
Offset -> Offset (r,g,b)
Power -> Gamma (r,g,b)
Saturation -> Color-B Saturation

XSLT / HTML EXPORT AND EXTENDED XML SCRIPTING OPTIONS

SCRATCH offers the option to export data using an XSLT transformation, which can be used to create HTML (but also any other format). When selecting HTML as export format, SCRATCH will:

- create an XML file with the data; this XML is identical to that when choosing XML export.

- perform an XSL transformation on that XML with the XSLExport.xslt file. A default xslt file is provided with the installation of SCRATCH. You can change it by copying the file to the \programdata\assimilate\settings folder and modifying it there or providing a new completely new xslt file with the same name.

- create proxy images in a subfolder for all the shots included in the export. These images can e.g. be used in the HTML page created with the XSLT.

The HTML export functionality requires a **license** that includes the *'Remote' module*.

AUTO-EXPORT

SCRATCH also offers the option to execute the XS transform automatically each time you exit a project, so the most up to date information is available for third party system integration. When setting the auto-export option to HTML in the Project-settings menu of the Logon-module, two additional options are available:

- Overwrite Proxies. By default SCRATCH will overwrite the image proxy files for all shots included in the export. When switching off this option, SCRATCH will only write a file when none is present yet. This saves considerable time processing for large projects but can also mean that not the most recent proxy is present.

- Export LUT. Together with creating a proxy image, SCRATCH can also create a LUT file per shot, depending of the selection this is a 1d or 3d LUT. The Overwrite setting also applies to exporting a LUT.

XML EXTENSIONS

- As of this version all the primary grade parameters are included in an XML export and can be updated through XML script / import.

- A slot can now also be referenced by its name next to its index position in XML scripting. Next to using the 'index=' attribute, you can also use the 'name=' atribute in the slot-tag.

- The 'Shot'-tag in an XML script / import can now include a new 'copy_grade' attribute. The value of this attribute references a shot of which the grade is copied to the shot updated / inserted. The value is either a slot-index number or a uuid.

- Until the previous version, when a new shot was inserted of which the media was already referenced by another shot, the color settings were automatically copied. In the new version an explicit color-copy is needed.

- Inserting new shots through XML when the actual media is not present (yet) will now create an empty node, rather than no node. An error is still generated to notify the missing media but this way no new commands have to be processed when the media becomes available.

CONSTRUCT UNDO / REDO

Each CONstruct now has its own **Undo/Redo stack**. The Undo/Redo functions ara available in the left bottom corner of the CONstruct menus or with Quick Keys Ctrl-Z / Ctrl+Y. Each stack has a maximum of 25 actions that can be undone. The following actions will clear the undo-stack: entering the Player, conforming an EDL / ALE, switching between slots and freeform CONstruct and exiting the project. Switching between CONstruct will preserve the undo-stack of the individual CONstruct.

USER INTERFACE

The menu lay-out of the CONstruct has been re-arranged to provide more comprehensible layout and to preserve space for future developments. Also, the layout of proxy images has been updated:

- The proxy image now includes a bar-code with 4 bars representing: 1. the shot contains a primary grading; 2. the shot contains a secondary grade; 3. the shot contains scaffolds; 4. the shot -framing is set. The bar code replaces the color bottom border

- The bar-code is also added to the Scaffold list where it represents the presence of: 1. primary grade; 2. secondary grade; 3. canvas/shape; 4. keyer, fill or matte.

- The presence and status of annotations with a clip are displayed in the proxies by the colored overlay and/or a new, more subtle, tag in the right top corner.

- Proxy display can be controlled in more detail and per user in the Settings sub-menu of the Timeline menu.

DEEP COPY BEHAVIOR

In previous version whenever you copied a shot, the new copy would use the same inputs as the original. In the new version SCRATCH will also make copies of any inputs the shot that is being copied uses. To prevent this **deep-copy behavior** you can place shots on a so called Reference-Construct. Shots placed on such a CONstruct are, when acting as an input for a shot that is being copied, referenced rather than also copied. You can switch a CONstrut to 'Reference'-mode through the Settings menu . The CONstruct will be marked with an additional icon in the Project-tree stack.

OTHER

- New options to export and import Tracking and Animation data. Using the general Save / Load buttons of the Matrix while in the Tracking submenu enables you to write and read (x,y) coordinates to and from a CSV file. In the Animation menu panel new Import and Export buttons are present through which you can import and export multiple Animation channels at once; all selected channels are imported / exported.

- Shot Quick Search. A new Search button on the CONstruct (Quick Key Ctrl+F) opens a dialog panel where you can enter search criteria to perform search over multiple CONstructs; a text search on shot name, reel-ID and annotation, together with the option to filter shots based on the annotate color / status.

- A new user setting in the Logon screen offers the option to set the default proxy size SCRATCH uses; small, medium or large.

- Creating a reference node in the Tray from multiple selected shots now preserves dissolves when the shots are on the timeline layer.

- A new Inverse option with the Load Layer function to add new shots bottom-up in the slots. Currently each shot found in the Load Layer function will be added to the CONstruct on top of previously found shots and already present shots. With the Inverse option each new subsequent shot found is added on the Timeline layer.

- Option to set negative value for SDI-Wipe option in the Settings menu of the Player; this will reverse the dual view display on the SDI view.

PLUG-INS

TEXT-FRAME AND SUBTITLES

A new Text-Frame plug-in offers **text-overlay options**. Next to adding plain text, the plug-in can use most of the same field-codes that are available for the new file-naming scheme. Adding a '**#**' with the name of the code and optionally the parameters will translate to the actual value. In a Text-Frame you can enter multiple textboxes and position each independently in the base image, as well as set properties like text size, font and color.

The new Text-Frame also supports loading external subtitle files, either *.stl or *.str* formatted. After loading the subtitle file, use the field-code #subtitle to display the subtitles. The two formats supported are both plain text formats. The srt format is described in http://srt-subtitles.com/. The stl format has different sub-formats, however SCRATCH supports only the plain text variant:

....
00:00:56:06 , 00:01:00:16 , first subtitle with in- and out-timecodes
00:01:00:21 , 00:01:05:24 , second subtitle | the pipe character represents a line-break
.....

The '$' tagged meta-data items at the beginning of an stl files are not processed by SCRATCH.

PROCESS NODE

A new Process node **replaces** the previously used *'Pan-Scan'* node. A processing node can be initiated from the CONstruct Media menu. The function will create a new processing node for each selected node in the CONstruct and take the selected node as input.

NEW DE-INTERLACER

A new OpenGL based De-Interlacer plug-in **replaces** the traditional de-interlacer. The new plug-in offers additional conversion types such as 24-25. When loading an existing project all old de-interlacer plug-ins are replaced with the new ones.

OTHER

- Substantial disk IO performance increase for read operations.

- The option to set a LUT and burn in the grade on an output node has been removed. Alternative you can enter the Player with the output node and use the Matrix menu panels to apply a grade or add a LUT to the output node.

- Added 'mp4' file extension for loading QuickTime files

- Dual-view is now the default setting in case 2 monitors are available. User the AS_ENABLE_DUALVIEW=FALSE in the SConfig file to disable dual view.

VERSION 5.0 [DECEMBER 2009]

IMPORTANT!

- As of v5.0 SCRATCH is released as a **64-bit** application only and will NOT run on a 32-bit operating system. The target OS for SCRATCH v5.0 is Windows 7 64-bit (any edition). Be aware that not all graphics cards are fully functional with Windows 7 (yet). We urge you to plan your upgrade to v5.0 and **please read carefully** the additional notes at the end of this article and the information in this article about (NVIDIA) graphics card support, downloading a suitable NVIDIA driver for Windows 7, installation issues and hardware requirements.

- This version uses a **new file format** for storing project data and is NOT backwards compatible. Existing projects will be converted to the new file format and any changes will be saved in the new file. The old project files are maintained and can still be opened with an older version of SCRATCH but will not reflect any changes made since the upgrade.

- Furthermore, this version of SCRATCH implements NVIDIA's CUDA technology, which is not fully supported by older graphics cards. Only NVIDIA cards with CUDA - Compute Capability version 1.0 or higher support all the new features. For the Quadro FX range these are the x800 and x600 cards. Even though most SCRATCH functions still work properly for older cards, ASSIMILATE does no longer actively support those cards from SCRATCH v5.0 onward. When using an older card, the new CUDA based image-statistic functions will not update continuously during playback and revert to a CPU fallback mechanism.

- This version requires a **new license** to be installed. See below for information on how to obtain a new license.

GENERAL

- Support for **RED Rocket**, RED's r3d decoding card. Once installed, you can choose to use either the SCRATCH software decoding or the RED Rocket hardware decoding by selecting from a pulldown in the Process->FX Controls menu.

- Version 5.0 also implements a new transformation step in the color pipeline which is very useful in the RED workflow. You can read more about the changes regarding handling of RED's r3d format and the new **Source Color Transform** in this article.

- Version 5.0 implements a real time Full Histogram, Waveform Monitor and Vector Scope. With the use of NVIDIA's **CUDA** technology all the statistics are updated with very little overhead on regular playback. In case your hardware does not support the proper CUDA level, SCRATCH will switch off the auto-update function or, in case of no CUDA support, use the CPU fallback version; in both latter cases the histogram, Waveform and Scope statistics are recalculated only for the last active frame each time the player is stopped.

- All project data is stored in a new **SQLite database format**. SQLite is a high performance, open source, file based database format and makes SCRATCH projects more scalable and makes saving project changes more efficient. When loading an existing project, SCRATCH will first require you to convert the existing project data. For more information about storing project data, please read this article.

CONSTRUCT / OUTPUT PROCESSING

- *Updating both Media and Timeline menu panel; moving command buttons to more appropriate positions.*

- **Importing & exporting** individual CONstructs, Group of CONstructs of the entire Project to an external file which can then be imported into another project. There are two file formats: a binary format which saves all project data and an XML format which will only save specific properties of a project and is intended primarily for external processing.

- New implementation of **XML scripting** capabilities with more fine-grained control over updating a SCRATCH project, copying media to the local system and adding media to a SCRATCH project. You can read more about the new SCRATCH project database format and XML scripting in this article.

- Additional function in the Media Browser to change the color space setting for a group of clips at once.

- New function (plug-in) to add a **color frame**. The plug-in generates a single frame shot, with either a solid color or pattern: color bars, grey ramp or zoneplate. You can add a color frame from the CONstruct menu. Furthermore, a color frame is also used when conforming an EDL; a black frame is inserted for a BL-event, rather than an empty clip.

- Added "Sound TC" field to the **ALE** export.

- Option to change the color / status of sticky notes on Clips, CONstructs and Groups.

- An output node's format, aspect and frame rate can be easily modified by dragging and dropping a clip node from the timeline on the output node in the Pipeline View. The resolution, frame rate and aspect ratio of the clip node are all applied to the output node.

PLAYER / MATRIX

- New **Source Color Transform** step in the color pipeline. A new Input menu panel was added in the Matrix. Through this panel you can set an initial color transformation before your primary grade. For more information on this, see this article.

- Added a new **Profile** section in the Player through which you can run a number of Benchmarks. The results are written to the SCRATCH log file but you can also save them to a separate profile file. Making a profile for your system right after installation can be very useful, serving as a reference in a later stage against which you can check system performance.

- Plug-in controls are now available from within the Matrix menu. You can insert a plug-in on an individual Scaffold and control the parameters of that without having to revert to the Process menu.

- Added GPU based high-order filter pass for SDI output.

- Enabled the use of 2 x SDI 422 during playout; this can be used with either the same source or layer0/layer1, enabling support for stereo left eye/right eye and recording both signals onto a single tape in a single pass.

- Matrix control layout; The Numerical menu panel has been updated to now also include Pre-Gain.

- Drag and drop functionality in the Version Stack of the Player.

- Added support for multi-channel WDM audio and RF64 audio format to cope with audio files larger than 4Gb.

- Improved playback performance QuickTime in Dual View.

OTHER

- Added a User setting to set the amount of mirror effect under a slot in the CONstruct.
- Added SConfig variable DM_MAX_RETRIES to recover from failures on processing files that were dropped in the SCRATCH Watch folder.

FIXES

- Missing Frametables for r3d files where sometimes wrongly reported, (not) logged or slowing down project loading.
- Spinning cursor would sometimes appear and remain when using r3d footage and a RED Rocket.
- Order of entries in recent paths list in file browser was not maintained properly.
- Proper paging and layout of parameter controls of OFX plug-ins.
- Stabilizer preserves existing framing setup.
- Camera was using incorrect offset on multi-pass renders.
- Handling illegal character in the Tangent WAVE mappings file.
- Dissolve on odd height destinations was 1 line off between render and view.
- SCAFFOLDS texture with different origin was showing incorrect.
- Orientation of texture fill/matte changed unexpectedly under some circumstances.
- RED TC global-mode was not persisted properly.
- Scaling of SCAFFOLDS maintained inconsistent center.
- Adjust the play position for disabled slots.
- Timeline not updating after Prune Construct.
- Incorrect sorting on timecode.
- Problem playing 24bit AIFF audio.
- Displaying correct initial time code of QuickTime.
- OFX plug-ins; search path for 64-bit plug-ins and plug-ins using hidden controls.
- When loading a custom Display LUT, the setting was not maintained across sessions.
- Display was not updated when selecting a reference node in the Tray.
- Use 10 bit (deep color) when not in spanning mode.
- Paste multiple shots did not maintain slot order correctly.

ADDITIONAL NOTES

- For version 5.0 a **new license** is required. You can request a new license by sending both your current license file and a SCRATCH log file to licensing@assimilateinc.com. The new license is not backward compatible. The new license should be placed in the C:\ProgramData\Assimilator\Settings folder.
- To work with SCRATCH and the **Red Rocket** you need to install the correct **firmware** (version 1.1.6.8) and the **driver** (version 1.1.4.0). These are available from the RED website at www.red.com.
- Please do **read** this article about NVIDIA graphic card support for Windows 7; be aware that not all graphics adapters are supported and / or fully functional with Windows 7 (yet).
- Additional information on hardware requirements and installation instructions are provided in chapter two of the manual .

VERSION 4.4 [JULY 2009]

IMPORTANT: For this version the settings for Play-out have changed. Please read about these changes in the release notes below and the user manual.

GENERAL

- This version implements RED's **new R3D Color Transform** for its camera build 20 firmware. Footage shot with older firmware will also use this transformation but to maintain the look and feel of the old transformation, the color temperature values Kelvin and Tint are adjusted. Footage in existing SCRATCH projects will <u>not</u> be affected in any way and continue to use the old transformation unless the grading on those clips is explicitly reset.

- Multi-core CPU Hyper Threading detection procedure Updated (i7 Core); SCRATCH now only use physical cores for memory intensive multi-threaded operations.

CONSTRUCT / OUTPUT PROCESSING

- The layout of the **PConfig.xml** file for **Play-out VTR** settings has been changed to support a separate delay setting for audio. The delays set now exclude the (5) NVidia frame buffer delays which are set dynamically. The names of the xml properties were changed to prevent using old settings. Most old values can be re-used by subtracting 5, but should in the end be determined by trial and error as they are VTR specific. Another element added to the play-out function is that SCRATCH will log if material with different framerates is used on the same timeline; something which might lead to duplicate frames and timing errors.

- In the main CONstruct module, an **Output Pipeline** view is added, showing the hierarchy of all outputs of a single CONstruct. You can enter this Pipeline view by using the Output button on the main menu bar of the CONstruct screen. From there you can manage all the outputs of a single CONstruct; changing output settings, adding or removing outputs. The Pipeline can either be shown in Proxy mode or in Icon mode (toggled with the View button); the former will show the proxies of the rendered output and the format / size of the individual outputs, the latter view will give a better overview when dealing with a complex pipeline.

- From the new Pipeline view you can also manage the new **Output-Template** functionality to create, store and re-use pre-configure output setups. A single CONstruct can have multiple outputs in different resolutions and formats, shown in the Pipeline view. You can now select a node in the output tree and save all nodes in the underlying branch to and external template file. This can then be re-used on other / new CONstruct to quickly setup your output pipeline. The files are saved in a pre-defined folder (C:\Documents and Settings\All Users\Application Data\Assimilator\Settings\Outputs) and the files are listed in the Output menu panel under Output Templates to be selected and applied. A template is always applied to the currently selected output node, meaning that the branch defined in the template is created under the selected node.

- As a result of the new Output Pipeline view, the controls in the CONstruct have been renamed / and re-arranged. The Settings menu was renamed Output and position switched with the Media button. Furthermore, the Exit and Save All buttons were added to the Media menu.

- Another addition to manage output rendering in SCRATCH is the **Process Queue** dialog, which can be opened from the corresponding button on the main menu bar of the CONstruct screen. The Process Queue gives you Project wide (over all CONstructs) overview and functionality to manage output rendering. Initially the Output Queue is empty. You can add jobs to the queue from the CONstruct screen or from within the Player, by either using the Process or Add to Queue buttons. The former will right away start the render process, the latte will only add the output render task to the queue. These will only be rendered till you start them from the Process Queue dialog or set a timer scheduler from within that same dialog.

- The **Process Queue** dialog shows of all outputs added to the queue the status and progress of the rendering. The dialog shows the order in which outputs are rendered and alows for you to set a start time to render the queue. Outputs remain in the queue untill you remove them but are only rendered again till the underlying media is invalidated (e.g. by changing the timeline of a CONstruct). Finally, the dialog shows where the output is rendered to and gives an approximation if there is enough space to render the output to a specific path.

- In the **EDL Assembler** an option to match name and reels cross-wise is added. Also, the auto-match function was replaced with regular start-stop buttons to control the matching process, including an abort option, progress indication and a Clear option to remove all matches in order to start the process again from scratch.

- The performance of the **Media Manager** was increased considerably. When dealing with large projects, opening of the Media Browser (introduced in the previous build) could take considerable time. In the new version part of the loading of the data will be done in the background, showing the dialog and initial results quicker.

- The user can set the default Output / Render folder in the project setting in the logon screen.

- Added a "**Recently used paths**" list to the File Browser. Each time a folder or file is selected the folder is added to a list; different lists are maintained for different purposes, such as images, color management, plug-ins.

PLAYER AND MATRIX

- Additional new **Color Curves** in the Curves menu of the Matrix: Hue vs. Hue, Hue vs. Saturation, Hue vs. Lightness, Saturation vs Luma and Luma vs. Saturation

- The mouse wheel is now enabled for all numerical controls which are mapped to the control surface and for Pre-Gain in the Levels menu in the Matrix

- Option to load **Color Decision List** (ASC CDL) as color setting. The existing function *CDL Export* from the CONstruct menu was removed to prevent confusion, as this was a different type of file.

- A User Setting was added in the panel in the logon screen to switch off the Bottom Swipe in the Player. When switched on use can no longer swipe down to switch to full screen / accidently remove the bottom control panel. When the setting is used, the short key 'Shift-Home' still works to switch to full screen; when in full screen, bottom swipe will still recall the Player control panel.

- The output node stack can now be accessed from within the Player, making it easier to switch between outputs. When the user entered the player with an output node the right swipe will show the full output stack.

- **VU meters** maintains the maximum levels within a single frame by keeping the higher level LEDs lit. The meters also continue to show last level when playing is paused.

- A **Stereo** option was added for QuickTime exports; when setting this option and when two audio channels are present, the stereo flag in the exported QuickTime movie will be set. Some external players would indicate that audio consisted of 2 mono tracks instead of stereo (a pure display matter).

- Added a **Color Copy plug-in**; takes the color from the first source clip and the luminance from the second and combine these into a new clip.

OTHER

SConfig variables and GFX Rendering (only use these settings after consulting Assimilate Support):

- Full floating point 1D LUTs are now the default mode on any G80 GPU's (as of FX4600/5600) or latter. The use of full floating point 1D LUTs has a severe performance impact on any pre-G80 GPU's. In case you do want to use this option on an older card you can use the AS_FULL_FLOAT_LUT = TRUE option in the SConfig file.

- Added two SConfig configuration variables: QT_MAX_OPEN and R3D_MAX_OPEN. These can be used to put a limit on the maximum number of simultaneous opened files. This is a tradeoff between memory usage and performance and should only be used with project with a very high number of r3d / qt clips and indications that one is running out of memory. The default for QuickTime is 256 and for R3D is 0 (unlimited).

- Added AS_RENDER_FLOAT32 to force rendering in full (32bit) floating buffers. This setting will double the memory needed for rendering!

- Added AS_USE_10BIT_FMT to force using native 10 bit GPU format for 10 bit images (DPX/Cineon). This only works on G80 GPU's and latter.

- Added AS_USE_16BIT_FMT to force using 16 bit integer format for 3D LUTs and 16 bit images. The 16 bit integer formats are supported natively as of G80 (NVidia) GPU's

This build also replaces AS_NO_16BIT_FP with AS_USE_16BIT_FP to force old behavior if needed on older GPU's (FX4600/5600 and later are G80 GPU's)

- Alpha is now by default disabled for QuickTime exports; with the SConfig variable QT_ENABLE_ALPHA you can enable the alpha channel again.Added 16 bit decode mode for RED RAW material. This only works when AS_USE_16BIT_FMT is set. User can change decode mode in the Processing control page in the Player.

- New version of SCRATCH's plug-in API. Details and examples of the API can be requested and will be posted on the SCRATCH support site.

FIXES

- Allow changing the current shot version while dragging Scaffold

- Audio channels after the first were interpretated incorrectly when converting to 16 bit

- Duration of 3:2 pulldown node was incorrect

- Scaffold layer with matte and fill the same did not scale properly

- Gamma range on R3D adjusted, now the same as in the Matrix

- CONstruct: move shots sometimes made a copy, slots can now be scrolled with the mousewheel

- Update on the OFX plug-in interface

- Plugin presets loading correctly.

- Adjusted statists view to support increasing number of CPU's. Also, the SDI interlaced modes did not always show the correct number of bars in the statistics view.

- Adjusted drop-frame detection in Play-out .

- Exporting EDL Dissolve-events properly.

- Dragging a node to another CONstruct did not result in a proper copy.

- Tracker did not maintain origin correctly on scaled images.

- RGB channel mixer did not work correctly with Offset and pre-gain. Loading existing setups which have used the channel mixer (Matrix/Levels) might be affected!.

- OFX plug-in controls were not always showing up correctly.

- Slot numbers in the CONstruct now take correctly into account the 'Count From' system setting; starting from 0 or 1.

- Proper audio from r3d files when rendering out to QuickTime.

- EDL, handling of reel-ids with non-supported characters. When SCRATCH writes out an EDL it will replace the reel-ids with numeric characters when some of the reels contain unsupported characters, such as an underscore. SCRATCH will then write a translation table at the bottom of the EDL with the original reel-ids. Now when reading back the EDL, SCRATCH will properly process that translation list.

- A texture image auto created an offset when "Grade" was applied.

- Aspect ratio was not always properly maintained after first load.

- QuickTime not always maintained lin/log flag correctly.

ADDITIONAL NOTES

- The configuration for Play-out has changed; previous set delays do not work anymore and need to be re-entered into the new PConfig file. The new layout is relatively self explanatory. The way the PConfig file is used and its location have not changed; check the manual for more info on this.

- This version of SCRATCH contains optimization specifically for newer (G80) NVidia GPU's. When using older GFX board (FX550 and before) you can use the enhanced features by setting the SConfig variable AS_FULL_FLOAT_LUT = TRUE. There will however be a performance penalty! The SConfig file can be found in C:\Documents and Settings\All Users\Application Data\Assimilator\Settings. Check the manual for information on the usage of configuration variables.

VERSION 4.3 [April 2009]

IMPORTANT: Upgrading to this build requires a new license to be installed.

GENERAL

- Improvements in GFX and main memory management and increasing robustness when dealing with large projects. The amount of GFX memory being allocated is displayed in the (Ctrl-F1) statistics display.
- Increased performance in debayering of r3d files and handling of large numbers of QT on the CONstruct.
- SDI enhancements:
  - Added 'Identity (RGB)' matrix to the SDI configuration dialog
  - Update on SDI color-space matrices used; now using ITU defined color-spaces.
  - When player sync option is set to automatic, SCRATCH will sync to SDI (when no audio is used and SDI is enabled).
  - option to frame-lock to external sync.
  - when SDI is enabled, SCRATCH will show warning message when frames are dropped on main output.
  - The default API that is used for SDI has changed; the config variable 'AS_USE_FBO_SDI_API' is obsolete and has been replaced with 'AS_DISABLE_FBO_SDI_API'.
- Enabling the Alpha in 8 and 16 bit DPX files
- User can abort Load Layers function by pressing Escape, if the process takes too long.
- New auto-save scheme. Auto-save is no longer turned off after an unexpected shut down and SCRATCH will make back-up copies of project files when the project is opened again. Also, the log file of the unexpected shut down is preserved by copying it to the project folder.
- A project is automatically saved before a render process is started.
- OS administrator rights are no longer required (although still advised); this is for facilitating installation on (not actively supported) Vista OS.

CONSTRUCT

- New and enhanced Project CONstruct tree management:
  - the CONstruct tree displays current clip/frame of individual CONstruct,
  - user can add notes to CONstruct and Groups,
  - drag and drop functionality to manage CONstruct, incl. user setting "Drag Threshold" to better time distinguish between click and drag
  - easy copying of whole CONstructs and binning multiple constructs,
- Rectangle selection on CONstruct and improved panning and scrolling of CONstruct.
- Enhanced selection and clip management in Trays; easy select and removing of (multiple) clips.
- Added function in the Timeline menu to paste the grading from clips in the copy-buffer to clips on the current CONstruct based on matching source-timecodes, reel-id and names.
- Added option to copy/past entire slots.
- Added controls in the media browser to set in- and out- handles on multiple clips at once. Also, added a column with the clip resolution. In- and out controls on the media menu in the CONstruct now set the handles of the new clips that are loaded.

PLAYER and MATRIX

- Gaussian fall-off smoothness function for softer-edges on Scaffolds.
- Added second dual view reference for the Edit module; this reference can be set seperate from the Matrix reference.

- Added options to set bit-depth and decode-quality for playing Quicktime movies and increased efficiency of handling large numbers of QuickTime movies on a CONstruct.
- Audio VU meters in Player menu and added audio playback capabilities for QuickTime.
- Option to adjust the y-axis scale of Full-Histogram with mouse wheel.
- New color-channel mixer to remap R, G and B to an alternative component; used for generating RGB from for example BGR image.
- Enhanced track-ball vector mapping. User can switch off vector mode and set an angle (in User Settings menu) to adjust color mapping.
- Separate controls for texture blur setting for fill and matte to individually control the blur level. When both fill and matte are selected controls are linked.

PROCESS and OUTPUT

- Increased render efficiency by placing encoding of Quicktime movies in separate background process.
- Enhanced support for Avid DNxHD QT codecs. The resolution index is set based on best match scenario relative to various project settings; Progressive/Interlaced; Bit depth 8/16; X/Y Dimensions; Quality; and FPS.
- Added a configuration variable to exclude certain QuickTime codec's from option list in SCRATCH. This setting can be used to prevent less stable codec's from being used. Furthermore, of all codec's with the same type identifier only the first (alphabetically) is shown in the selection list.
- Added option to enable audio channels on the VCR on an edit command.

FIXES

- Update on SDI levels and clipping
- Loading (named) LUTs properly
- Improved parsing of FCP EDL (dissolve) events and ignoring audio events
- Handeling of EDL vari-speed and EDL from FCP with flip/flop events.
- Playout stop accuracy and audio output
- Regenerate correct timecodes when rendering QT or R3D to separate folders
- Audio playback did not resume when after player encountered clip without audio
- SDI colorspace selection mismatch
- Better smoothening on Scaffold edges
- Time codes in exported EDL and ALE files are formatted with the CONstruct framerate.
- EDL reverse-assemble generates dissolves
- Process-fit width and height are now properly applied if CONstruct included anamorphic shots.
- The image formats configuration file now accepts resolutions larger than 4096
- Graded textures display properly in 2nd Scaffold
- Color-B wheel updates properly with Wave panel.
- Wave panel also works during playback from another module than the Matrix menu.
- F12 – quick key for starting output rendering is more responsive
- Properly handling of long list of audio devices.
- Remove audio artifacts in r3d files.

ADDITIONAL NOTES

- For version 4.3 a **new licence** is required. You can request a new licence by sending a log file to licensing@assimilateinc.com . This license is not backward compatible. However, you can just leave your existing licencse file where it (C:\Documents and Settings\All Users\Application Data\Assimilator\Settings) and copy the new one in the same directory. That way, in case you want to to install a previous build, it will be fully functional.

VERSION 4.2 [dec 2008]

GENERAL

- Support for the new NVIDIA 'Deep-Color' (10bit Display Port) mode has been added.
- Two new RED color spaces, RED RAW LIN and RED RAW LOG, have been added for direct grading in linear or logarithmic mode on RED R3D files.
- The NVIDIA-SDI settings can now be controlled from within the SCRATCH interface.
- SCRATCH's custom configuration parameters, including many new parameters, can now be more easily managed using a single configuration file.
- The Scaffold Softness parameter has been enhanced along with improved performance.
- SCRATCH uses more sophisticated memory management for processing 4k source material.
- Further optimizations for reading large files from disk have been added.

CONSTRUCT

- The new EDL processing tool, called The Assembler, provides precise control over the conform process as well as allowing you to edit the EDL to ensure a proper conform.
- Media Browser to manager all of the shots within your SCRATCH Project, including filtering capabilities so you can quickly locate the shots you are looking for and modify them with a single click.

PLAYER

- The Plugin Browser makes it easier to find and apply effects and save presets of your most common effects.
- The updated Tracking functionality gives you more control over the tracking process to get exactly the results you require.

PLAYER - Extended Audio Support

- ASIO devices are now supported for audio output.
- You can load individual audio files per shot and control up to 8 separate channels.
- Embedded audio in the RED R3D file format is automatically read directly from the R3D files.
- Any loaded audio is automatically included in QuickTime exports.

ADDITIONAL NOTES

- As of SCRATCH 4.1 build 491, the REDNODE is included in the AssimSetup.msi. If you are upgrading from a previous build of SCRATCH where you had to add the REDNODE as a separate operation, any existing REDNODE files in the C:\Program Files\Assimilate\bin folder MUST be removed manually before installing this build.
- SCRATCH 4.2 build 504 is fully compatible with previous setups. However, projects created with this version are NOT backward compatible.

VERSION 4.1

GENERAL

- The Tracker has been updated to be faster and more precise with a new interface. Added tracking support for r3d media at all resolutions.
- SCRATCH now supports DUAL output for STEREO workflow and versioning. Allowing for simultaneous fast processing of left eye and right eye.
- SCRATCH now support per shot audio and added support for r3d embedded audio.

VERSION 4.0

GENERAL

- SCRATCH now fully supports the Tangent CP-300 Wave panel.
- Additional XML commands are now available.
- Offset, Lift, Gamma, Gain and a custom LUT can be applied to individual clips.
- Audio file and audio slip values can be applied to individual clips. NOTE: The ability to play per-clip audio is still in development at this time. Audio clips can be assigned but playback is currently limited to the entire CONstruct audio file.
- Reading large image files with small block sizes has been optimized.
- Overall bug fixes and optimizations.

CONSTRUCT

- An ALE file can now be exported from the CONstruct. This allows users to pass clip information to other systems while preserving all of the metadata information.
- The 'AS_ALWAYS_MATCH_NAME' environment variable was added. When set, SCRATCH will only conform a clip if the timecode and clip name both match the source EDL. Previously, only one matching value was required.
- There is now a FIND MEDIA option in the CONstruct. This allows users to reconnect shots in a SCRATCH Construct for which the source files have moved to a different location.

PLAYER

- Support for ASIO audio devices has been added. The active audio driver can be selected in SYSTEM SETTINGS. When audio is enabled in the SCRATCH Player, the sync will default to AUDIO. To ensure proper audio sync, the ASIO audio card must be locked to a valid reference. Additionally, when using the NVIDIA SDI output, both the ASIO audio card and the NVIDIA SDI card must be locked to the same SYNC source to ensure synchronized playback of picture and audio.
- The QuickKey 'TAB' has been added for toggling to a clean, full screen display.
- A new per-project error log and dialog have been added. This allows users to view and troubleshoot playback errors within the SCRATCH interface. The Error Log dialog can be accesses using the ERROR MENU button in the CONstruct view or through the QuickKey 'CTRL-E'.
- Timecode and frame number entries can now be directly selected from the Player interface.
- The Version Stack selection can now be controlled through QuickKeys 'Page Up' and 'Page Down'. The Version Stack selection can also be mapped to the external control panels.
- 'Add Version' and 'Bin Version' in the Version Stack can now be mapped to the external control panels.

PROCESS

- Timecode can now be embedded in the header of EXR files rendered out of SCRATCH.
- Dedicated XYZ conversion options have been added. Pre- and Post-Gamma settings can be adjusted in the PROJECT SETTINGS. These are set to .65 and 2.6 by default but should be set to proper values to match specific XYZ conversions.

- A new REGENERATE option is available in the CONstruct SETTINGS menu. When DISABLED, each clip's source timecode will be written into the resulting output file's header. This was previously the default behaviour. When ENABLED, the SCRATCH CONstruct timecode will be written into the output file's header. Users can control this by toggling the button on or off.

- Source timecode can now be written into files generated by additional SCRATCH Output Nodes. Previously, only the Main Output Node would use the source timecode. Now all Output Nodes can include this information.

- The CONstruct is now saved before processing is started.

- Output rendering has been optimized. NOTE: These optimizations may create slightly different output results from previous SCRATCH versions.

- QuickTime outputs have been optimized.

MATRIX

- Users now have the option to disable Texture Fill/Matte assignments for PASTE operations.

- The way SCAFFOLD Canvas's are rendered has been modified so that any blur applied to the Matte channel will be applied to the Canvas shape as well. This allows for more control over the softness of a Canvas shape. As a result of these changes, this version of SCRATCH may create different results from previous versions.

- The SHOW MATTE option can now be controlled using the QuickKey 'M' while in the MATRIX menu. Also, the MATTE for the current shot can be viewed as a high-contrast, black-and-white image by toggling the Alpha channel selection in the View Port Menu Bar at the top of the View Port.

- When isolating a color channel on a SCAFFOLD, the source image no longer needs to be loaded separately into the MATTE channel.

PLAYOUT

- The PLAYOUT menu now has an option for RECORD TC or SOURCE TC.

- When set to RECORD TC, SCRATCH uses the CONstruct timecode as the basis for the PLAYOUT to tape.

- When set to SOURCE TC, each clip's source timecode will be recorded as the timecode on tape for PLAYOUT. This requires that the deck's internal timecode generator be set to PRESET, so that SCRATCH can update the timecode being generated to match each source clip as the PLAYOUT is happening.

- The 'AS_ABORT_ON_ERROR' environment variable has been added. When this variable is set to 'OFF', PLAYOUT will continue even when errors have been detected. The errors are still logged, but PLAYOUT will not abort the layoff. Users can view the Error Log and check the resulting tape for accuracy once the PLAYOUT has completed.

RED

- SCRATCH now supports the latest RED camera Firmware, Build 16.

- The R3D metadata color information is now processed outside of the SCRATCH MATRIX values. Previously, the R3D metadata was added using the MATRIX OFFSET parameters. With Version 4.0, the metadata color is processed prior to the SCRATCH MATRIX. Users can still bypass the metadata color information by using CTRL-RESET from the main MATRIX menu. A normal RESET will revert back to the metadata color values.

- The new REDspace color space has been added as a gamma option for R3D files. The gamma selection is accessed in the PROCESS->FX CONTROLS menu.

- A new REDspace display LUT has been added in the RED folder under C:\Program Files\Assimilate\Settings\LUT.

- The decoding of R3D files has been improved to allow for better recovery from errors in the R3D files themselves. When rendering, SCRATCH will render any bad frames as black frames and report them on the new error console. Users should always check the Error Log to determine if any frames have been skipped or eliminated.

- SCRATCH now reads the frame rate of R3D files directly from the file. This ensures the proper frame rate is assigned to the shot.

- The ISO value for R3D files is read directly from the metadata of the R3D file. This ensure the proper ISO value is used within SCRATCH.

- The handling of half- and quarter-resolution proxies has been improved to ensure proper scaling and framing.

ADDITIONAL NOTES

- If you are upgrading from SCRATCH 3.5 you need to obtain a SCRATCH 4.0 license. Please send your current license file and a new log file [after installing new version] to licensing@assimilateinc.com. Keep in mind that it might take some time to get your new code from the licensing team.