

I. INTRODUCTION

Thanks for becoming a user of JaleOctane.

JaleOctane 2.7 is a major new release of Jaleo. Running on SGI Octane systems, it adds sophisticated real time effects to Jaleo's integrated editing and compositing functions.

But of course, there are more new features and functions in this release. As an overview, Jaleo 2.7 provides:

- Realtime effects on appropriately configured Octane systems
- Greatly improved non-linear editing functions (Global Editing)
- A new audio subsystem with support for multichannel audio IO and improved audio/video synchronisation
- Improved editing for Chroma keys and 3D DVE
- Reordered effect set to improve accessibility of effects
- Improved paint with fill and "magic wand" shape generation, and better response to pen pressure
- Application of Motion Tracking to many effects, including paint shapes
- A new real time IO application, much easier to use and much more efficient

This update manual describes the new features in this release only. For information on features already present in Jaleo 2.6, please see the Jaleo 2.6 documentation set.

We believe that Jaleo on Octane marks a major productivity milestone in digital video postproduction. Not only can you edit and create visually rich composites and transitions, but you also get an unprecedented set of real time effects with uncompressed video in a nonlinear environment.

Have fun with Jaleo! – and please send us your opinion and feedback on the product. Don't forget, your input is most important to us.

Best regards,

The Jaleo Team at Comunicación Integral

P.S: Please take the time to read the Release Notes – they contain important information on this release of Jaleo.

II. NEW FEATURES OVERVIEW

The software described by this paper, Jaleo Octane 2.7, provides:

- Feature set of Release Jaleo 2.6
 - Note: Backup and Restore is handled very differently in Jaleo 2.7 than it was in Jaleo 2.6
- Additional features specific to Jaleo Octane
 - Realtime effects with multiple streams of video (some new or improved in this version)
 - Multiprocessing Support
- Additional Features for Jaleo 2.7
 - Global Editing functions for greatly improved non-linear editing. These functions include Global Split, Cut, Lift, Copy, Overwrite, 3 point and 4 point edits, as well as Append&Cut. Also, in Loader, Flipbook and Gallery you can pre-trim clips and directly apply editing functions from there. Keyboard shortcuts for editing are one key, and provide very similar operation to common NLE editing systems.
 - Source code time code display in the reel
 - XFS support for real time storage
 - Support for Octane's 8-channel audio hardware and appropriate routing on a per-clip basis
 - Strongly improved synchronisation between audio and video in the reel
 - Possibility to use Motion Tracking for a variety of effects, among those paint shapes
 - Improved paint: Performance improvements, better response on tablet pressure, a new fill operator. A magic wand tool can be used to generate shapes.
 - Improved Pick Editor for easier setup of keys (direct selection/picking of color ranges, transparent and solid areas, as well as crops in addition to the histogram)
 - Improved 3D View displays transparencies and background track
 - Some improvements to DVE-GL: Support for high res images, improved antialiasing, de-interlace filter, wave pattern deformation generator, built-in crop

- Pulldown Removal and 3:2 Pulldown rendering
- Improved group behaviour: By default, groups now trim their content if stretched. To allow time warping, it must be explicitly enabled for the group.
- Active Monitor: One monitor now is always active. Active monitor follows group navigation, i.e. moves up and down through groups when navigating.
- Drop frame support in the reel (NTSC), RtVideo and EDL import.
- “Live” project switches. You can change projects on the fly without leaving Jaleo or other applications.
- A new RtVideo, featuring a greatly improved interface, multi-sequence capture and playout in a single edit (much faster) and many other improvements.
- Preview generation on the fly. That is, preview images do not have to be created with RtVideo any more (this is still possible, though). Jaleo creates the preview images on the fly, where needed, or you can recreate them in Jaleo with a menu command.
- Reorganized effect set

For Jaleo 2.7, the effect menus have been reordered a bit. This affects the Key, DVE and FX menus, most of all. All effects, even the most obsolete ones, are still available in Jaleo 2.7, but some have been removed from the first line of access to ease learning.

- The Key menu now gives direct access to the real time compositing and keying effects, as well as to the high quality keys originally available in the PlugIn menu. Obsolete or rarely used effects have been moved to a new submenu called “Backward Compatibility”.
- The DVE menu now gives direct access to the Wipe library. The software 3D DVE has been replaced by the DVE-GL (previously available from the PlugIn menu only) that in Jaleo 2.7 covers all the functionality of the old DVE and more. Obsolete effects whose use is discouraged have been moved to a new submenu called “Backward Compatibility”.
- The FX menu now gives access to a re-organized color-corrector submenu: there now is a choice of less, and more general color correctors, simplifying choosing and operation of these effects.

III. EDITING FEATURES

The Global Editing functions are distributed between new functionality in the Reel and new functionality in the Loader, the Gallery and the Flipbook.

The new editing functions are designed to give you traditional NLE-style editing capabilities in the Reel. You can for example perform three and four point edits, as well as overwrite edits directly from the Loader, pre-trimming the material you wish to insert. You can also use these functions to quickly work in a cut&paste fashion to change your timeline arrangements.

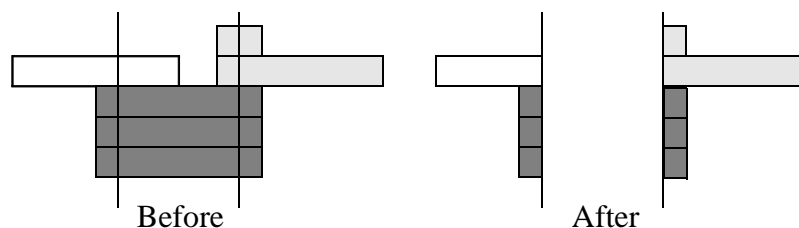
III.1 Global Editing

III.1.1 Function Overview

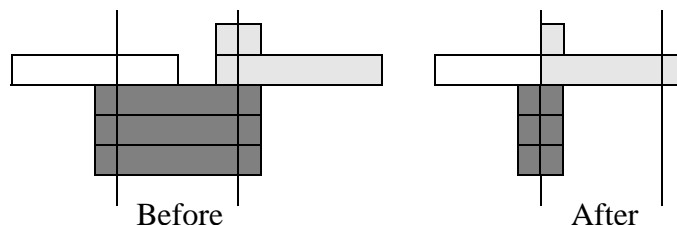
Global Editing functions allow to modify the content of a reel on a “Global” basis - that is, instead of affecting only one clip or layer, or a selection, they potentially affect the complete reel content. Therefore, they are called “Global” editing functions.

The functions provided allow to:

- Split all clips at a given position
- Lift all reel content between the edit in and out mark

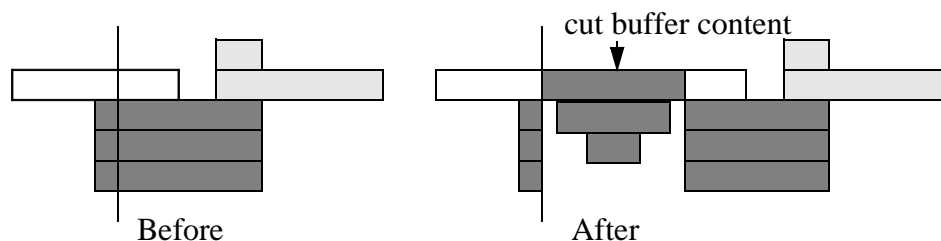


- Cut all reel content between the edit marks, moving all content right to the edit out mark to the edit in mark



- Copy all reel content between the edit marks to the paste buffer

- Insert space. This function splits the reel content at the edit in position and moves all content right of the in mark to the out mark, making space for more content to be added.
- Insert the paste buffer (which can be filled by either of the Lift, Cut, or Copy operations, as well as the “local” cut, copy, paste operations in the Edit menu) at a reel position, splitting (opening) the existing reel content and making place for the new material. This is equivalent to a three point edit, where two points are defined by the length of the paste buffer, and the third by the selected reel position. Note that this function can also be invoked directly from the Loader, the Gallery and the Flipbook.



- Insert the paste buffer as described above, but using the Edit marks for in and out point of the insert. In this mode, the paste buffer content is placed in a group, and a timewarp is performed to make the length of the paste buffer match the area marked by the edit marks. This is equivalent to a four point edit where two points are defined by the length of the paste buffer, and two by the edit marks in the reel. Note that this function can also be invoked directly from the Loader, the Gallery and the Flipbook.
- Overwriting the reel content starting at a selected position with the paste buffer content. Note that this function can also be invoked directly from the Loader, the Gallery and the Flipbook.
- Append new material from the paste buffer at a reel position, deleting all prior content to the right of the selected reel position. This allows to quickly create initial cuts with long captured material, adding one clip after the other, without worrying about exact cutting. Note that this function can also be invoked directly from the Loader, the Gallery and the Flipbook.
- Lay material from the paste buffer ‘on top’ of existing reel content, starting at the selected reel position. This action will neither overwrite nor delete any existing reel content.

Paste Buffer

The functions that add material to the reel use the paste buffer content. The paste buffer is filled by *all* Jaleo cut or copy functions - that is, by the “local” Cut and Copy functions applied to the current selection (in the Edit menu) as well as by the new Global Lift, Cut and Copy functions.

Selected Reel Position

This position is defined by the current Active Monitor position in the Reel.

III.1.2 Protecting Clips from being Edited

Clips in the area affected by the global edit can be protected from being modified by using the Lock command from the Clip menu on them. Only clips not locked will be affected by Global Editing commands.

Protection is for example useful to keep a long audio track to be affected from video material inserted.

III.1.3 Three and Four Point Edits from Loader, Gallery or Flipbook

Additionally to the functions described above, various of the global editing functions can be evoked directly from the Loader, the Gallery or the Flipbook.

The preview windows now allow to specify In- and Outpoint for the clip, and to invoke

- Insert 3point
- Insert 4point
- Overwrite
- Append&Cut
- Lay On Top

Invoking these functions is equivalent to placing the pre-trimmed clip in the cut buffer of Jaleo and then selecting the appropriate Global Editing function in the Reel.

III.1.4 Using Global Editing

For using the Global Editing functions, there is a simple rule:

- Whenever a function requires a single Reel position (Split, Insert 3point, Overwrite, Append&Cut, Lay On Top), the position of the Active Monitor is used. In Jaleo 2.7, one monitor is always active, so that a current position is always clearly defined. The active monitor is displayed with larger and highlighted top and bottom.
- Whenever a function requires two positions (Cut, Lift, Copy, Insert 4pt, Insert Space), the Edit Marks are used. The Edit Marks can be positioned by dragging or by using the Select>Bring submenu (functions In to Monitor, Out to Monitor and Mark Selection). These functions also have keyboard shortcuts (i, o and t). They move the in and out mark to the Active Monitor position or move the marks to beginning and end of a selection, respectively.

All cuts or splits happen in the same fashion as on a tape-based editor: The inpoint (or active monitor position) is included, and the out position is excluded from the edit mark. If you for example Split at the Active Monitor, the frame you are positioned at will be in the clip at the right of the split point.

The Global Editing functions are located in a new Reel menu “Global”.

With the exception of Split and Insert Space, all Global Editing functions either use or fill the paste buffer. Cut, Lift, Copy put the affected material into the paste buffer, the Insert functions, Overwrite and Append&Cut use the content of the paste buffer. Note that the paste buffer can also be filled using the Cut and Copy commands from the Edit menu, which affect arbitrary selections of material.

III.1.5 Mark Selection functions

With the Mark Selection command (keyboard short-cut t) you can:

- Place the marks around any selection
- Place the marks around a hole
- Place the marks around a section found to the left and right of the current position

This is how it works:

- Position the edit marks around the current selection. Select any number of clips and press t (or select the menu command) to position the in mark at the beginning of the selection and the out mark at its end.
- Click in a “hole” between clips. If you then press t or select the menu command the mark in will be positioned to the left of the hole, and mark out to the right, so that you can remove or fill the hole conveniently.
- Click anywhere above or below existing reel content. If you now press t or use the menu command, the system looks to the left and right for the closest clip boundary in any layer and positions the edit in mark at the closest left boundary and the edit out mark at the closest right boundary.

Note: In contrary to earlier versions of Jaleo, all functions that move edit marks now automatically activate the edit marks in case they were disabled before.

III.1.6 Reel Keyboard Shortcuts

In the Reel some keyboard shortcuts are defined. You can of course use the arrow keys as always to position the reel and the active monitor. Newly defined shortcuts are (mouse cursor must be over the reel area):

- i: Set edit in mark
- o: Set edit out mark
- t: Mark Selection (set in mark to left of selection and out mark to right of selection)
- v: Insert3pt to reel
- f: Insert4pt to reel
- g: Insert Space
- b: Overwrite
- a: Append&Cut
- z: Lift
- x: Cut
- c: Copy
- s: Split

Note: Using direct keyboard shortcuts in the Reel (that is, keyboard shortcuts without modifier keys) interferes with tear off menus. If you have tear off menus open, *do not use* the keyboard shortcuts.

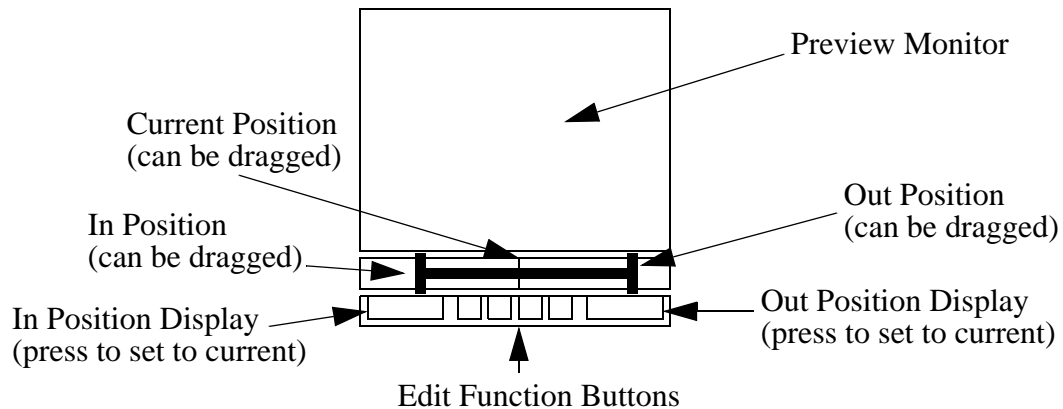
III.1.7 Navigating Edits

You can now use the Tab key to move the Active Monitor quickly to the next Edit (clip boundary). Accordingly, Shift-Tab moves backwards to the previous clip boundary.

III.2 Extended Loader/Gallery/Flipbook

You can also invoke the Insert functions, Overwrite and Append&Cut from the Loader, the Gallery or the Flipbook. In the preview windows of these programs, you can trim the selection before invoking the functions.

The preview window now shows a trim bar and insert controls at its lower end (in the Flipbook, these controls must be activated from the menu bar).



You can set in- and out points while previewing. With the mouse cursor over the preview monitor, you can also use the following keyboard shortcuts:

- Left and Right arrow keys: Play forward and backward
- Space: Stop
- Alt+arrow L/R: Step one frame left/right
- i: Set inpoint to current position
- o: Set outpoint to current position
- v: Insert3pt to reel
- f: Insert4pt to reel
- b: Overwrite
- a: Append&Cut
- Alt-v: Lay On Top

Note that in the trimming tools of the Loader, of the Gallery and of the Flipbook the same keyboard shortcuts (as in the Reel) are used for equivalent operations.

III.3 Active Monitor Improvements

With Jaleo 2.7, one monitor is always active – in older versions, a monitor would only be active if activated explicitly. As one monitor always is active, there is always a defined position usable for the global editing functions.

Graphically, the active monitor is marked by larger and highlighted top and bottom grab boxes.

Normally, the first monitor you open is active. It stays active even if additional monitors are opened. If you want to switch activeness to another monitor, use the Active Monitor option from the respective monitors pop-up menu.

If you close the currently active monitor, activeness is translated to a remaining monitor window. This is normally the monitor window created next after the current active monitor. By translating activeness to another monitor on closure, it is ensured that there always is an active monitor.

NOTE: the Active Monitor position is used as a center for zooming in and out the timeline, actually allowing this zooming while preserving the Active Monitor position.

Active Monitor and Group Navigation

The active monitor also has a new behaviour when navigating groups: unlike normal monitors that do not follow a navigation into a group (but follow a navigate out if you create them in a group), the active monitor follows up and down into groups. Therefore, no new monitors need to be created to monitor group content. It is also still possible to monitor upper levels by leaving “normal” non-active monitors in the level of interest.

III.4 Improved Group Behaviour

Group behaviour has been modified.

Originally, stretching a group with the mouse created a time stretch effect. Before, to trim a group, stretching with the Alt key was required. As this made operator errors too easy, and subsequently we have changed group behaviour. It is now as follows:

The default, normal group, allows for trimming, and shows as a green bar in the Reel. The default group does NOT automatically allow for time-warping. If you want to timewarp a group, you must ‘switch on’ this feature for the group; it will change its representation to a much lighter green to indicate that now it can be time-warped. Of course, a group that has its time-warp feature ‘switched on’ can be trimmed; to do this, you would use the mouse PLUS the Alt key. So:

- Stretching a group trims the group just the same way it trims a clip.
- You must enable timestretching/warping explicitly on a per-group basis. To do so, use the command Allow Timewarp from the Clip menu. A group with timewarps enabled will appear in a much lighter shade of green in the reel.
- Templates (groups with inputs), although still an unsupported feature, are displayed in yet another shade of green.

- Trimming a time-warp enabled group (or effect) is achieved by using the mouse AND the Alt key.
- The active monitor now moves into and out of groups when performing group navigation (see “Active Monitor Improvements” on page 13 for more information). Whenever possible, its position in time is preserved during these operations.
- When trimming a group, subsequently navigating into this trimmed group will give rise to displaying the full content range used for the original group, plus two vertical marker lines indicating the range of the trimming action.

III.5 Clip Source Code Timecode Display

The Setup>Reel>Show Timecode option has been modified to display source timecode of a clip if available instead of zero-based timecode. For effects, groups or clips without source timecode information, zero-based timecode is displayed when the option is enabled.

III.6 Preview Generation on the Fly and Preview Regeneration

Using the new RtVideo (see “New RtVideo” on page 41), clips can be created without preview material, speeding up the material acquisition process considerably, and saving on storage space at the same time.

If Jaleo reads in a clip without preview images, it will create the preview images on the fly from the high res images.

It is also possible to regenerate preview images for any number of selected clips using the command Clip>Redo Previews. This command will create preview images for each selected image clip. Note that this command can not only be used to create preview material not created on capture, but also to change the preview resolution used - if you switch the preview resolution set up for Jaleo, previously created previews will not be very useful, unless you recreate them.

On JaleOctane systems, you will most likely not need preview images when you do projects that are intensive on editing, and that do not contain truly deep and complex compositing stacks. If you use low res mode for evaluation of complex stacks without previews precreated, evaluation will be slower than with precreated images, but faster than high res processing. If a stack becomes truly deep, it might be worth to recreate previews for just this stack to speed up operation.

Preview recreation allows you to balance compositing performance and time required at capture in a flexible manner, to adapt better to the project processed.

Note: JaleOctane's real-time effects may not provide real time in low res mode without pre-created preview images.

Note: when rendering you can choose to set the generation of the low-res materials to 'none'. In this case, the low-res proxies will not be created. In previous versions of Jaleo, this prohibited the use of e.g. the low-res monitor. Once again, in this Jaleo version, these preview resolution images will be created when you need them - on the fly. This feature can for example be useful for preserving disk space, especially when using half-resolution proxies.

Drop Frame Support

With Jaleo 2.7, the Reel can be set up for drop frame operation. In drop frame mode, all location TCs are interpreted as drop frame timecodes, or converted, as required. If you enter a non-drop frame time code in drop frame mode, it will be corrected. All durations are always non-drop frame values.

Setup for drop frame mode is done using a setup variable in the `.jaleorc` setup file. Please also see the Installation and Setup Guide for more information.

IV. REAL TIME EFFECTS

JaleOctane provides real time execution of the following effects (in this version):

- Dissolves and wipes
- Color Correction, including posterization and solarization
- Color Remapping (that is, select a color/color range and replace it with another)
- Compositing with Chroma Key, Luminance Key or External Key
 - Chroma Key supports chroma suppression
 - External/Luminance Key can create a (colored) drop shadow
 - External/Luminance Key can be an autokey or can be derived from an independent stream.
- 3D DVE with deformations and (colored) drop shadow
- Solid Color Generator

Real time effects can be used like any other Jaleo effect. That means they can also be stacked as desired, even be combined with all the other available effects. Of course, if too many real time effects are combined, or if real time effects are combined with non real time effects, the result will not execute in real time any more.

Please see “RealTime FX Reference” on page 65 for more information on effect usage and parameters.

JaleOctane supports multiprocessing for all effects. That is, the two CPUs in Octane are used for execution of all effects, just like in Jaleo Plus.

V. QUICK KEY SETUP – PICK EDITOR

The Pick Editor has new features that allow to define keying parameters for most keying effects more quickly and easily.

On the bottom of the editor now is a line of function buttons. Each button, when pressed, enables a picking mode. Buttons are provided for picking key color, areas supposed to be transparent, areas supposed to be solid, and a cropping window. Not all buttons are active in all keys; for example, the CompKeyB key does not allow to define a color, as the key always uses blue as its keying color.

The pick editor now allows to quickly change the current frame, in the same fashion as the Motion editor does. Just drag the clip cursor on the effect selected to the frame you wish to see. All settings made will be set as keyframes for the frame selected, so that parameter animations can easily be accomplished. Just pick values as desired on one frame, change to another frame and reset the parameters as desired.

There is an Unfix button to delete a keyframe placed. If you do not like the settings you made for a keyframe, use Unfix to remove the settings.

NOTE: please take care of inadvertently creating animations: if you decide to change the active frame, actually having the intention to define keying parameters for a complete sequence (NOT having the intention to create an animation), please do not forget to delete (or ‘unfix’) previously created Control Points in other frames. If you do not delete previously created CP’s, undesired animations will be the result.

Selecting transparent and solid areas is normally be done with the key displayed in the Pick Editor. To activate key display, use the toggle labelled Show Key in the bottom line.

For all keys, setting up Clip and Gain is much easier with the new Pick Editor. You can successively pick all areas you wish to be transparent, than all areas you wish to be solid. If you overdo it, you can press Unfix, and start all over. The histogram gets updated while you work as well.

To setup for example the real time chroma key, you would do the following:

- Open the Pick Editor with the effect selected
- Choose the Pick Color button
- Select the background color you are interested in. You can pick a single pixel or drag open a rubberband rectangle. If you are not satisfied with your choice, simply pick again.

- In the Time Editor, adjust color tolerance for the background color of choice. The default value is good for blue, for green a decreased value most likely gives better results.
- Switch to key display
- Choose the Pick Transparent button and select (rubberband) areas that should be transparent. Typically, these are background areas where some grey pixels still can be seen. If there are lots of bright greyish pixels in background areas, or even white, then you most likely have picked a bad color, and you might wish to return to color selection.
- Choose the Pick Solid button and select (rubberband) areas that should be solid, that is where pixels are to grey for your liking. If in an area that definitively is foreground are lots of dark or even black pixels, you might consider to return to color setup.
- Use Crop to limit the key to a sub-area of the image.
- Use Unfix to reset the settings for the keyframe you are at if so desired.

Note: Other key effects are set up in the same sequence, but may not offer all the options. In this case, the respective buttons are greyed out.

VI. EFFECT SET IMPROVEMENTS

VI.1 Reorganized FX Set

In Jaleo 2.7, the Key, DVE, and FX menus have been reordered to increase usability and to make learning easier. In the process, a number of older effects that have been superseded by better implementations have been removed from the first level of menu and have been placed in submenus called “Backward Compatibility”. All effects available in earlier versions are still included in Jaleo 2.7 – a number of obsolete effects have changed their location, though.

For details on effects that are new, please also see “RealTime FX Reference” on page 65.

VI.1.1 Key Menu

The reorganized Key menu contains the following:

Compositing Effects

- CompositeKey - Alpha

CompositeKey - Luma

CompositeKey - Ext. Key

These three menu entries call up three different presets for the new real time capable CompositeKey effect. This effect is a far stronger superset of the old Composite and CompositeShadow effects that originally were found at this spot.

The first option exactly emulates the operation of Composite and CompositeShadow, creating a composite using the alpha channel of the second input (the effect also supports more than one foreground clip).

The second option is using the luminance of the foreground image to create a composite with “autokey”. This effect is equivalent to Key Color in Luma mode plus Composite.

The third option creates a composite using an additional input as alpha. For each foreground track set to External Key, an additional input is required to provide the key. This effect is equivalent to ExtKey plus a Composite.

- **Composite Chroma**

This is the new real time capable chroma key effect. This chroma key gives very quick and good results. It can be set up very quickly using the new Pick Editor (see “Quick Key Setup – Pick Editor” on page 18). It provides color spill suppression and it can be used in difference key mode. If you need even more advanced Chroma keying, use the CombKeyB/G effect.

Keyers

- **CombKey B/G**

Jaleo’s most powerful keyer. It can be used as direct or difference chroma key. This key is not new, but it was previously “hidden” in the FX>PlugIn>PluggedKeys sub-menu.

- **Key Color.** A key based on a single pick color, by default operating as a luminance key. This effect can use a second input to create the key. The pick color now can be edited using the pick editor.
- **External Key.** Creates a key for its first input from the luminance of the second input.
- **Pick Color.** Creates a key from a color list picked in the Pick Editor.
- **Luminance Band.** Creates a key from high, mid and low luminance bands in the input. This effect, in combination with with a color correction effect, allows for luminance band corrections.

Tools

- **Size.** Allows to grow or shrink a key
- **Utilities.** A number of keying tools. No changes compared to prior versions, except that the Edge Filter effect has been moved to the Backward Compatibility menu.

Backward Compatibility

- **Composite, Composite Shadow** – composite a number of foreground channels on a background, with or without shadow. Superseded by the new CompositeKey effects, that are more flexible, can create keys without requiring an extra effect and are capable of real time operation in many configurations.
- **Key Chroma.** Obsolete keying effect.
- **Pick Chroma.** An obsolete effect very similar to Pick Color.
- **Edge Filter.** A key postprocessing utility that is obsolete.
- **Color Difference.** A color difference key superseded by CompositeChroma and CombKeyB/G.

- **Fast Key.** A keyer superseded by CompositeChroma and CombKeyB/G.
- **Suppress.** Spill suppression tools rendered obsolete by the inclusion of these tools in all new keying tools like CompositeChroma or CombKeyB/G.

VI.1.2 DVE Menu

DVE

The DVE in this section is an improved version of the hardware accelerated 3D DVE previously found in FX.PlugIns>FasterWithHardware. This effect now contains all features of the software 3D DVE and more, so that there is absolutely no reason any more to use the software version. See “Improved 3D DVE” on page 24 for more information. The DVE can be used for 2D DVE effects as well, of course – for this purpose it shows better performance than the old 2D DVE effects.

Wipes

The Wipes section of the first DVE menu level contains the Wipe Library, with preset, modifiable Wipe patterns.

Motion Tracking

This is the same set of Motion Tracking effects as in previous versions. Please note that from Jaleo 2.7 on you can use Motion Tracking with many additional effects (see “Motion Tracking Extensions” on page 37 for more information).

Others

- Page Turn
- Corner Pin

These effects are exactly identical to earlier versions of Jaleo.

Backward Compatibility

- **3D DVE Software.** The old software version of the 3D DVE. This version is rendered obsolete by the improved hardware accelerated 3D DVE.
- **DVE 2D.** The 3D DVE is providing much more functionality with significant improvements in all areas (please use the 3D DVE + CompositeKey when creating shadows).
- **Wipe, WipeSh.** Truly obsolete first generation Wipe effects. Please use the Wipe libraries and/or the Wipe libraries + CompositeKey (for shadow wiping) instead.
- **Link.** An effect to create multi-level DVE movements. Made obsolete by the global transformation level of the 3D DVE.

VI.1.3 FX Menu

The FX menu has two reorganized submenus, called the Image Correct submenu and the Utilities submenu. Furthermore, the Backward Compatibility submenu is added, containing the older (and now obsolete) effects.

The reorganized menus look like this (going from the main Fx menu entry):

- **Image Correct** submenu:
 - Color Correction: new, general color correction effect.
 - Six Vector Correction: secondary color correction effect (moved from the PlugIns menu).
 - Color Correction - RT: a replica of the ColorCorrectionRT effect in the FastFX menu.
 - Color Vector Correction - RT: a replica of the ColorVectorRT effect in the FastFX menu.
 - Crop
 - Crop Expand
- **Utilities** submenu:
 - Solid Color: color generator (older Jaleo versions used RGB Filter with no entry).
 - Grade: grade generator; now uses dithering to prevent banding artifacts.
 - Noise Patterns: BW and color noise patterns (moved from the PlugIns menu).
 - Wave Patterns
 - Stripe Patterns
 - Circle Patterns
 - Empty: the 'empty' effect.
- **Backward compatibility** submenu:
 - Luma: please use 'Color Correction' instead.
 - HLS: please use 'Color Correction' instead.
 - RGB Filter: please use 'Color Correction' or 'Solid Color' instead.
 - RGB Transform: please use 'Color Correction' instead.

VI.1.4 Fast FX Menu

The names of the effects in the Fast FX menu have been chosen as to distinguish these effects from similar, non-realtime effects in other menus. The effects are:

- ColorCorrectRT: main color correction effect in real time.
- ColorVectorRT: secondary color correction effect in real time.
- CompositeChroma: chroma keyer/extractor, difference keyer, in real time.
- CompositeKey: luma/ external luma keyer, in real time.
- DVE-RT: real time DVE

Section XIII (RealTime FX Reference) of this manual gives extensive information on the features of this effect set.

VI.2 Improved 3D DVE

The hardware-accelerated DVE has a number of improvements. Usage of the standard 3D DVE should not be necessary any more, as now all functionality (and more) of the standard DVE is available in DVE-GL:

- It now supports oversized images, similar to the normal DVE3D. If the image is too big for hardware rendering, DVE-GL switches to software mode automatically. Oversized clips can be created for Jaleo by importing a large image or image sequence with drag&drop to the reel and storing the result sequence on the computer disk as a file sequence, *not* as an XFS clip. By default, 3D DVE will scale such oversized images down to fit the monitor, but modifying the zoom and position parameters allows you to zoom in and pan over the image.
- A new anti-flicker parameter in the Camera folder of the DVE permits to create smoother animations with field rendering. This parameter is boolean, i.e. it can be activated or not. The anti-flicker filter is particularly valuable when panning over a huge background image with a lot of fine detail.
- The Displacement section includes a Wave pattern generator for Wave deformations. This is the same wave generator as available in the real time DVE – please see “DVE - RT” on page 72 for more information.
- There are crop parameters that allow to limit the area of the DVE. This has advantages over using an external crop effect – for example that a full cylinder can still be created with cropped material. The internal crop does not replace image areas with black or a color, as an external crop would do, but makes the DVE act as if the image used was smaller.

VI.3 Improved 3D View

3DView now has two additional features:

- It shows transparencies in foreground layers
- It displays the background layer

Setting up a 3D DVE effect with partially transparent foreground layers is much easier this way.

VI.4 New Color Corrector

The new Color Correction effect (a non-realtime effect) attempts to both improve and simplify general color correction in Jaleo. It basically covers the functionality of the existing HLS, RGB and Luma effects, and adds the possibilities to manipulate gamma values and black levels on a per-component base. It can be found in: Fx -> Image Correct -> Color Correction.

Additionally, it introduces a dithering algorithm to prevent banding problems, especially visible when operating on images of synthetic origin with large, graded areas or on very dark images. A good way to visualize the effectiveness of dithering is the following setup:

Create a grade effect with a grey scale grade from left to right. Add the ColCorrect effect on top of the effect and set global Gain to 10. Add another ColCorrect effect and set global Gain to 1000. Make sure that dithering is activated in both effects. View the result in high res. Now build the same stack, but with dithering deactivated. View the result in high res.

The “obey mask” feature, known from other Jaleo effects (the effect is only applied to the area limited by the image’s alpha channel) is supported, but it is optional, activated by a parameter, making the effect both faster and of more general use.

Parameters:

- Gain: Global gain (or luminance)
- Gamma: Global gamma control: the value is defined as a value to which a 50% gray will be projected. 50 means no change. Higher values make middle tones lighter, and vice versa.
- Black: Global black level
- Saturation: Global saturation control
- Hue: Hue shift, in degrees of rotation on the color wheel (360 degree equals 0 degree)
- Gain-RGB

- Red, Green, Blue: Per-component gain control. Acts as in the RGBfilter effects. The values are offset by the global Gain control.
- Gamma-RGB
 - Red, Green, Blue: Per-component gamma control. These values are offset by the global Gamma control.
- Black-RGB
 - Red, Green, Blue: Per-component black level values. These values are offset by the global Black level control.
- ObeyMsk: Can be zero or one. If zero, the mask is ignored. If one, the correction is limited to the masked area. In both cases, the mask is passed through the effect.
- Dither: With almost any correction, the resulting pixel values have to be rounded up to integer values. If this parameter is set to zero, simple rounding is used. If it is set to one, algorithmic error distribution is used to reduce the rounding error introduced, which causes much better results in almost any case.

The default value for this parameter is one (activates), and you should leave it this way, unless there is a special reason not to apply the effect. One possible reason not to use dithering is that you plan to save the rendering results to a file format that uses run length encoding for storage – these formats do generally not cope too well with dithered patterns, as their compression method will not work in this case.

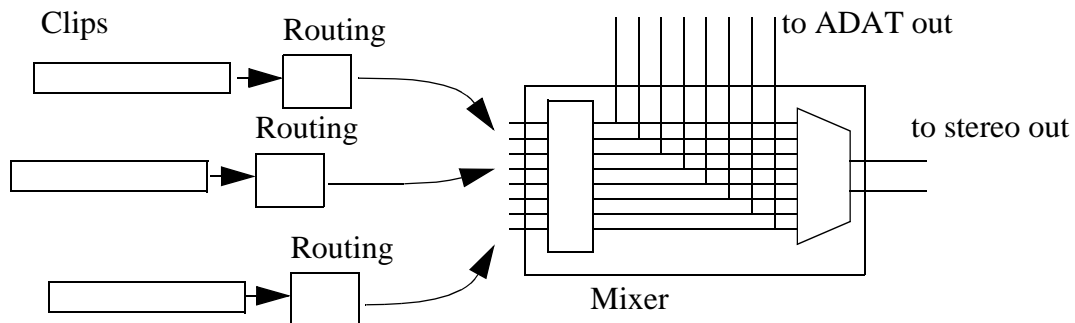
VII. AUDIO

VII.1 Support for 8-Channel Audio

Jaleo Octane supports the new audio hardware built into Octane machines. The new hardware provides optical audio I/O connectors which either can operate as stereo AES/EBU links or as ADAT 8 channel links. Jaleo can be set up to use these 8 ADAT channels as independent output buses. Also, as before, Jaleo can use the base audio analog or AES/EBU connectors.

Jaleo 2.7 implements an 8 bus submixer for audio. Each and every audio track in Jaleo can be routed to any of the 8 buses. If the system is configured to use the ADAT output, the 8 buses are directly passed on to the ADAT outputs. If the system is configured to use analog or digital stereo outputs, the 8 buses are mixed down to a stereo sum, which is then sent to the outputs.

There still can be any number of clips with audio in the reel. Basically, every track of audio present in the reel presents a “virtual input” to the 8 bus mixer of Jaleo. In previous releases, the mixer was always stereo, that is, there were no subgroups available.



Each video clip with audio, or each pure audio clip, can now contain up to 8 tracks of audio. In prior releases, a clip could contain not more than two tracks of audio.

For each clip containing audio, a Routing dialog is provided that allows to determine the routing of the tracks contained in the clip to the 8 (output) buses. The Mixer dialog allows for mixing down these eight buses into a two channel output.

Both Routing and Mixer parameters are static over time: Routing provides for settings on a per-clip basis, while the Mixer settings should be perceived as being static, global settings.

VII.1.1 Dynamic clip audio controls

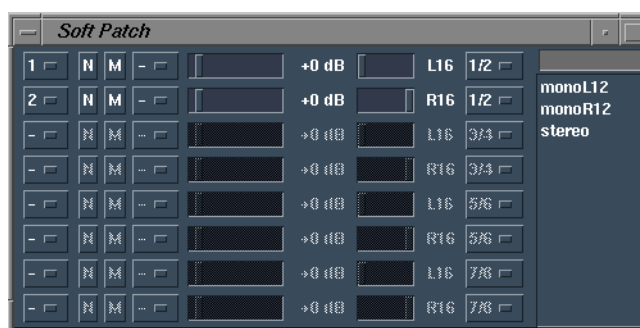
- For each track within a clip, track volume can dynamically be defined using time-curves in the Time Editor. For this, each audio track contained in a clip has its own animatable gain control, giving each audio track a ‘volume’ time curve (in a logarithmic scale). Also, there is an animatable, (linear) global volume control for the whole clip: all audio tracks within a clip are affected by this ‘overall volume’ time curve (named the ‘Fade’ time curve).

The interface to these controls is provided by the Time Editor.

All other clip-related (preset/static) audio settings are provided in the Routing dialog.

VII.1.2 Routing Dialog

For every clip that contains audio, individual routing for each of the audio tracks contained can be set up. The interface is called up using the Clip>Audio>SoftPatch menu command.



The dialog shows eight lines, each representing one of up to 8 mono tracks. Normally, each track present in the clip is represented by one line, but really this is a general 8-by-8 routing matrix where each line can be fed by any of the tracks of the clip. This allows you to route the same track to multiple buses.

The controls from the left to the right:

- Popup menu for track selection: normally, this popup shows the track numbers in ascending order. Tracks that are not present are switched off by default (represented by a “-” instead of a track number in the first column). There are situations, though, where you may wish to route the same signal to more than one bus. In this case you can select the same source track in more than one line. You can only select source track numbers that are actually present in the clip (for example: you can not select source track 8 for a clip that only has track 1 and 2).

Whatever the number of tracks inside a clip, you may assign a maximum of eight assignments for these tracks (for example: you may assign track 1 of a two-channel clip to ALL buses 1-8, although the Soft Patch will initially show only two assignments for such a clip).

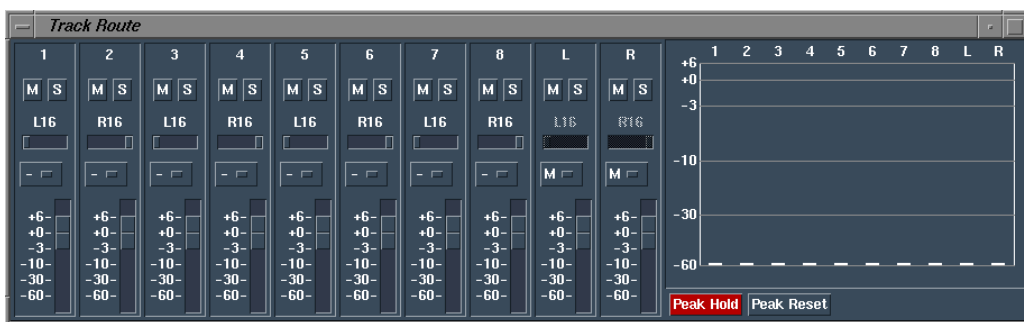
- The button labelled N allows you to revert the phase of the input signal.
- The button labelled M, when activated, mutes the track.
- Group popup. You can assign a track to one of four groups, A to D. Gain settings made for a member of a group are automatically followed by all other group members.
- Track gain. This allows you to adjust a preset gain setting for the track.
- Panorama. Each track is routed to a pair of buses, 1/2, 3/4, 5/6, 7/8. With the panorama setting, you can position the track on a single bus only or balance it between the buses forming a pair.
- Bus Pair. This pop up allows you to assign the track to one of the four bus pairs. By placing the panorama control to the very right or left, assignment to a single bus can be accomplished.

Additionally to the track settings, there is a preset box that allows you to create and select a number of presets for your clip Soft Patch settings. To create a new preset, create the settings you like and enter a new name in the text field. Press return. The new preset appears in the list. To delete a preset, select it and press Delete. To call up a preset, select its name in the list.

Presets are stored in `JALEO-ENV/etc/audio/preset_name.arf` (using the file extension `.arf`).

VII.1.3 Mixer Dialog

The 8 audio buses are controlled by the mixer (Clip>Audio>Mixer). Here, every bus can be muted or solo'ed (that is, heard alone). Also, volume control is provided.



Note:

If the system is set up for using the ADAT outputs, each bus corresponds to one of the ADAT output channels. The controls for the stereo sum are disabled if ADAT operation is set up.

If the system is set up for stereo outputs, each bus can be positioned on the stereo sum (with the pan control), and the stereo sum level can also be controlled.

The mixer dialog presents the master settings for the 8 buses and the stereo sums (the stereo sums are only accessible if the system is configured to use the stereo outputs instead of the 8-channel ADAT out).

The controls for each bus are as follows, from top to bottom:

- Mute: The “M” button mutes the bus;
- Solo: The “S” button mutes all buses except the one where the button is pressed. Multiple channels can be solo’ed;
- Panorama. Only applicable if stereo outputs are set up for Jaleo. In this case, determines placement of the bus in the stereo sum;
- Groups. Four groups are available, A-D. All buses with the same group assigned share their settings. There is also a fifth group labelled M which is preset to be grouped with the master faders, but if M is deselected in the master fader’s group popup, you can use group M as a normal group.
- Bus Level. Volume control for the bus.

To the right of the mixer controls is the VU meter section that allows you to control the bus levels. Peak levels are displayed and help according to the state of the Peak Hold button.

Note:

For information on how to setup the new audio system, please see the Installation and Setup Guide.

VII.2 Improved Synchronisation between Audio and Video

The audio functionality as described above is implemented using a complete new audio subsystem. An additional benefit of this new subsystem is strongly improved synchronisation between audio and video playback in the reel.

Note: Unless all your reel uses real time effects or pure cuts, you should always use Skip Frame mode (from Setup>Reel>Skip Frame). In non-skip frame mode the video subsystem will reproduce all frames of the sequence, even if rendering times are far longer than real time. This will cause synchronisation between audio and video to be lost, as in non-skip frame mode there is no space for correction. In skip frame mode, as many video frames as necessary are skipped, to maintain synchronisation with the audio material.

Note:

Please also see the Installation and Setup Guide for more information on how to setup the new audio system.

VIII. IMPROVEMENTS FOR PAINT

The RotoPaint PlugIn for painting in Jaleo has received various improvements:

- Extensive use of caching makes painting and animation in sequences much faster.
- Response to pressure from a tablet has been greatly improved. There is now also a pressure curve that allows you to adjust the pen reaction to pressure.
- Motion Tracking can be used to animate paint strokes and shapes
- Brushing mode option for continuous paint flow
- Painted strokes can use a spline interpolation of the paint path, instead of the polyline interpolation used before.
- A new fill operator creates flood fill effects which can be animated (in seed position and fill parameters).
- A “magic wand”-style tool can be used to generate paint shapes.
- Keyboard shortcuts have been homogenized with Jaleo. Also, a new keyboard shortcut can be used to direct picking if tangent and control points are overlapping.

VIII.1 Performance Improvements

One improvement is in the area of performance tuning. The paint PlugIn can now cache work done, so that rendering speed is greatly improved. Also, interactive work is accelerated a lot, especially if lots of strokes are drawn in a variety of images. Also, saving and loading of Paint instances or environments using them has been improved considerably.

Caching is controlled in the setup menu.

The option Setup>Cache>Cache is a toggle that enables or disables caching. Normally, you should have caching enabled. However, if you are using paint with a set of strokes and you wish to try various image clips as input to paint, you will have to disable the cache – although RotoPaint recognizes when its own data changes, it can not detect if the image clips below have been replaced. Therefore, if you change clips under a paint effect a lot you may wish to disable caching while testing which clip is the desired one. If you are not changing the clip(s) under paint constantly, you may also clear the cache after the image has changed, but leave it activated, so that every render done from this point on still remains cached.

To delete the current cache for the paint instance selected, use Setup>Cache>Clear Cache. This will discard prerendered cache images, so that every image evaluated from this point on gets re-rendered. Clearing the cache might be necessary after changing the clip(s) used as input to the paint plugin, as it can not detect if its inputs have changed or not.

VIII.2 Response to Pressure

Response to tablet pressure has been improved. In addition, the setup is more flexible: there is a new entry in the setup menu, “Brush Options”. This opens a dialog window which displays a pressure response curve. Using this curve, you can adjust response to tablet pressure, if necessary.

Note: Pressure will only work as desired if a Wacom tablet with an appropriate (and properly installed) driver is connected. See the Installation and Setup Guide for more information on installing a Wacom tablet.

VIII.3 Motion Tracking for Paint Shapes and Strokes

It is now possible to animate strokes and shapes in RotoPaint using Motion tracking. For this purpose, the animation menu in RotoPaint now provides a new option, Copy Keyframes. This option can be used after applying motion tracking data to the paint effect.

To make motion tracking work with paint, the Paint PlugIn now shows two time curves (X and Y) in the Reel’s time editor. These curves serve as a destination for the Motion Editor – after creating the tracking path in the Motion Editor, its Apply command will place the resulting curves in the X/Y curves of the effect the motion is applied to. In case of paint, these curves do not have a direct effect, they just serve as temporary storage for the data from Motion Editor. The Paint window’s Copy Keyframe function takes the data from these temporary time curves and copies it over to the animation of the currently selected shape.

To perform motion tracking for paint, the process is as follows:

- First create the stroke you want to animate. Create it at the location where it is supposed to be at the particular frame where you create it.
- Add a keyframe for the shape at this position. Do not forget this step, or the process will not work. A shape must have at least one keyframe set in order to be able to receive motion tracking data.
- Call up the Motion Editor from the Reel’s Tools menu.
- Trace the motion of the desired object in the image.

- Apply the resulting animation, once satisfied, to the Paint instance. This will apply the motion tracking data to the temporary timecurves.
- In the paint window, select Animation>CopyTracking to Keyframes. This will copy the animation from the motion editor to the shapes animation.

See also “Using Motion Tracking with RotoPaint Shapes” on page 39.

VIII.4 Continuous and Single Shot Brushing

In the Setup>Brush Options dialog, there is also a new mode switch. You can select between continuous or single shot brushing. In effect, when using single shot brushing, if you press down the pen at a point without moving, no more color will flow after the initial button or pen down event. In continuous mode, the brush behaves more like an Airbrush, adding color continuously as long as the button or pen is held down.

VIII.5 Spline Interpolation for Strokes

Paint strokes can now be created using spline interpolation instead of polylines. Earlier versions of Rotopaint did produce a very dense polyline. This version can still do this, but there is also the option of creating a less dense spline curve from painting, resulting in smoother pen movements.

To activate spline stroke interpolation, use Setup>Spline Stroke.

VIII.6 Fill Operator and Shape Generation with Magic Wand

VIII.6.1 Fill Operator

To flood-fill an area, select the paint bucket tool from the Paint toolbox. You can click at any point in the image to position the seed point for the fill. The fill will spread until it finds pixels that meet certain tolerance criteria.

The fill is a vector shape like any other. The fill seed point is denoted as a circle with a cross in it in vector edit mode. It can be selected like any other shape, and moved. You can keyframe its position over time if so desired, or create a new fill in every frame.

Updates

If you change parameters of the fill, you will normally not see updates of the shape rendering before you press the Render button. You can have automatic re-rendering by setting the AutoRender option from the Setup menu to on (see also “Setup>AutoRender” on page 36).

Fill Brushes

Fills can work with three brushes:

- Paint
- Tint
- Reveal

The color for the paint and tint brushes is the actual foreground color selected in the color box. Color can be animated like for any normal shape or stroke.

Fill Parameters

As stated above, the fill proceeds from the seed point in all directions until pixels are found that exceed certain tolerance criteria. These tolerance values can be set using the Fill Parameters dialog. To open this dialog, press the button with the same name found under the Paint Bucket button.

The dialog that opens has two parts:

- On the left, a control for mode of operation which is not used for the paint bucket tool (for magic wand only)
- At the right side, controls for color tolerance

The three threshold sliders control the red, green and blue tolerance by which a pixel color must be distinct from the pixel color of the seed point picked to be considered a border to the fill. The higher the tolerance value is set, the further the fill will extend.

- Red. Tolerance for the fill in the red band.
- Green. Tolerance for the fill in the green band.
- Blue. Tolerance for the fill in the blue band.

VIII.6.2 Shape Generation with the Magic Wand

The Magic Wand tool, located at the side of the Paint Bucket, can be used to automatically find a curve surrounding a certain area. It is very similar to a flood fill, only that the result of the operation is a curve enclosing the “flooded” area.

Generation of a Jaleo Shape

The shape outline generated by the Magic Wand tool can, once you are satisfied with it, subsequently be converted in a normal Jaleo shape by pressing the “Make Shape” button close to the magic Wand tool.

The shape can then be edited, animated etc. like any other Jaleo shape curve.

Updates

If you change parameters of the shape generation, you will normally not see updates of the shape rendering before you press the Render button. You can have automatic re-rendering by setting the AutoRender option from the Setup menu to on (see also “Setup>AutoRender” on page 36).

Shape Generation Parameters

As stated above, the shape generation proceeds from the seed point in all directions until pixels are found that exceed certain tolerance criteria. These pixels exceeding the tolerance will be considered part of the exterior curve of the shape.

The tolerance values can be set using the Fill Parameters dialog. To open this dialog, press the button with the same name found under the Paint Bucket button.

The dialog that opens has two parts:

- On the left, a control for mode of operation
- At the right side, controls for color tolerance

The mode switch works as follows:

- “Int. Curve”. If this mode is activated, you gain additional control over the generation of internal curves, that is, curves marking “islands” in the area enclosed by the magic wand. Islands must have at least the size (in pixels) as adjusted by the Noise slider to be retained - if they are smaller they will be flooded.
- Noise. This is the average size an enclosed “island” area exceeding the seed color tolerance range must have to prevent it from being flooded.

The other mode switch and the slider are disabled for the Paint Bucket tool. They do have a function with the shape generation tool.

The three threshold sliders control the red, green and blue tolerance by which a pixel color must be distinct from the pixel color of the seed point picked to be considered a border to the shape. The higher the tolerance value is set, the further the shape outline will extend.

- Red. Tolerance for the fill in the red band.
- Green. Tolerance for the fill in the green band.
- Blue. Tolerance for the fill in the blue band.

VIII.7 Change in Modifier Key Behaviour

Selection and Copies of Attributes

In previous versions of RotoPaint, with the Shift key pressed, brush attributes could be copied from one shape to another. To do so, one would have selected the source shape, pressed and held Shift and then double clicked the destination shape.

This function is now accomplished with the Ctrl key. Shift is now used to add or remove to/from selections, as commonly expected.

Selection of Overlapping Control Points or Tangents

If control point and tangent markers overlap, selection can become very difficult.

If points and tangents overlap, picking without any key pressed will always select the point, while picking with Alt key help will select a tangent.

VIII.8 Other Changes

Setup>AutoRender

The new AutoRender function replaces Render on Delete in previous versions. Render on Delete forced a re-render of the remaining vector shapes if one shape was deleted. AutoRender is a slightly more general approach to the problem – if activated, it forces automatic re-renders in a variety of situations where a change of the vector data occurs.

Setup>Hide Tangents

If activated, the tangents of spline curves are hidden, to have a cleaner and less polluted display of vector shapes.

IX. MOTION TRACKING EXTENSIONS

It is now possible to use Motion Tracking with a wide variety of effects. Basically, all effects that contain x/y position parameters can be animated using motion tracking.

Additionally, objects in paint can have motion tracking applied to their animation, providing a very powerful way to quickly create animated garbage mattes and many other effects that require the application of paint strokes to moving objects.

IX.1 Effects supported by Motion Tracking

The following effects can be used with Motion Tracking. Note that the application logic automatically scales, inverts or otherwise processes the tracking results to make sense with the parameter value range of the effect.

DVE

If no track is selected, Motion Tracking is assigned to the global track. If a track is selected in Time Editor, tracking is assigned to the track selected.

Of the track selected, motion tracking affects:

- Translation X/Y
- Zoom X/Y if at least two trackers are used
- Rotation Z if at least two trackers are used

Crop

Motion tracking is applied to the cropping parameter selected (up, down, left, right). If none of the parameters is selected, nothing is applied. The tracker results are automatically scaled and inverted where necessary to provide proper results.

Noises

Noise patterns can be animated using motion tracking.

The following noise patterns can use motion tracking:

- Noise
- Plasma

- NoisePat

The parameters that will be modified by motion tracking are:

- Translation in X/Y is assigned to Roll X/Y
- Rotation in Z is assigned to Roll Z
- Zoom in X/Y is assigned to RadX/Y of the noise

As always, tracking results are processed to make sense with the value range of the effect selected.

CenterBlur

- Translation X/Y will be applied to CenterX/Y parameters of the effect.

DirBlur

- Rotation in Z will be applied to the Angle parameter

Circle

- Translation X/Y is used to control the Circle center

Title

- Translation X/Y
- Zoom X/Y if at least two trackers are used
- Rotation Z if at least two trackers are used

Link

- Translation X/Y
- Zoom X/Y if at least two trackers are used
- Rotation Z if at least two trackers are used

IX.2 Using Motion Tracking for Effects except Paint

Usage of Motion Tracking with effects other than the standard Motion effects on the DVE menu, works entirely analogous:

- Select the effect in the Reel
- Select Tools>Motion Editor
- Create the tracking as desired

- Use Apply from the Command menu of Motion Editor to apply the resulting curves to the effect.

IX.3 Using Motion Tracking with RotoPaint Shapes

To permit motion tracking with paint, the Paint PlugIn now provides timecurves for X and Y coordinates in the time editor window. In contrary to all other effects, where these curves directly control the effect, in paint these time curves serve as a temporary destination for motion tracking paths generated by the motion editor. The data applied to these time curves is then transferred to a paint shape using the Animation>CopyTracking to Keyframes command in the paint window.

For more information, please see “Motion Tracking for Paint Shapes and Strokes” on page 32.

X. XFS STORAGE

Jaleo 2.7 uses XFS storage as a replacement to using Raw partitions. XFS has various advantages:

- It allows network access to the storage medium
- It is accessible to standard system tools
- It is accessible to standard third party backup tools
- It provides excellent performance

XFS partitions must reside on disk arrays with sufficient bandwidth for real time performance. See the Installation and Setup Guide for more information.

In comparison to normal Jaleo 2.6 installations, this version does not provide a separate backup and restore utility. However, as XFS-stored captured video files are accessible just as any other file in the file system, normal backup procedures can be used. For backup of material on video, the new RtVideo can create backup and restore lists for all YUV material on the XFS storage array. These lists can be auto-conformed to and from video for fast backup/restore.

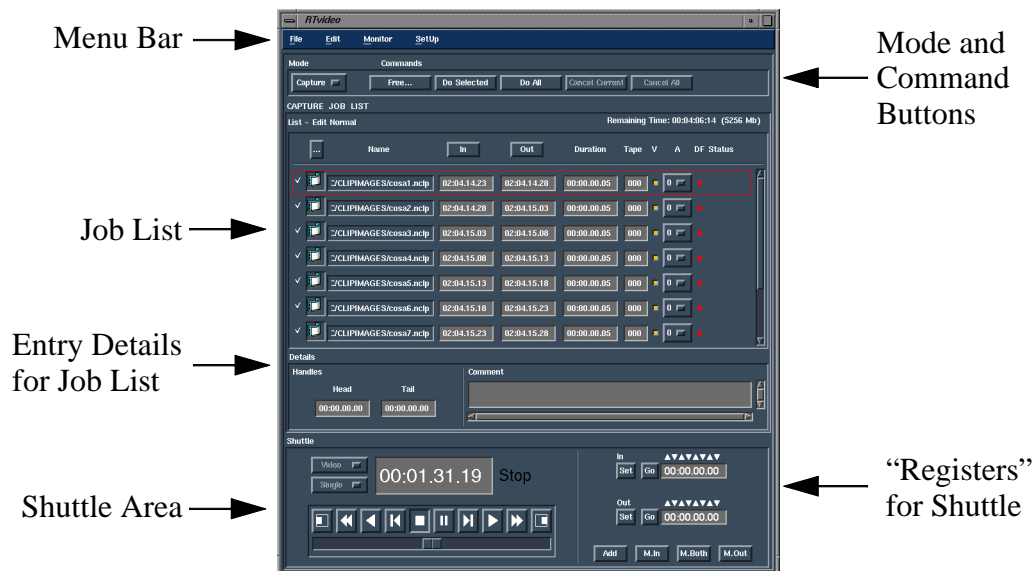
XI. NEW RtVIDEO

The new RtVideo features a new user interface which gives permanent access to the job list and is much easier and logical to use.

It also has a number of additional advantages:

- Faster operation. Consecutive image sequences are now handled in a single edit, instead of separate edits as before. This is true for playout and capture and speeds up operation considerably.
- Drop Frame support in NTSC. Tapes in NTSC drop frame time code will be accepted and processed correctly.
- Possibility to disable automatic preview image generation. This again increases speed of the capture operation. To match this feature, the Reel now can generate previews on the fly, and you can also regenerate preview files on demand (see below).
- Integrated fast Backup/Restore of material from the disk array to video.

Rtvideo looks like this:



The new RtVideo window is subdivided in two main areas:

- the Job List area

- the Shuttle area

The job list area displays a capture or playout list depending on the mode of operation. This list contains all the controls necessary to define and modify a list of IO operations on one or multiple tapes. IO lists support ripple editing, so that changes made to one entry can propagate through all the list.

The shuttle area is used to control a VTR. It also displays “registers” for timecode values that can be used to remember a number of TC values and value pairs, and to quickly apply such pairs to edit list entries.

XI.1 A Typical Capture Session

In a typical capture session, the operator would add a number of entries to the job list. A job list entry contains a name for the clip to be captured (names can also be given automatically), in- and outpoint on the tape for the sequence to be captured, a reel-ID to identify the tape, and track settings telling RtVideo about which tracks (Video, up to 8 audio tracks) will be captured.

To find in- and outpoints on tape, normally the shuttle controls are used to search for the right spots on tape.

Once a list has been created, it can be executed by using the Do All command. It is also possible to perform any selection from the job list by using the Do Selected command.

Alternatively, a job list can be created by importing a standard Edit Decision List (EDL) in a variety of formats.

Sometimes, it is also desirable not to use a job list for capture, but to start capture manually – an application is for example to capture from a camera. This is supported by RtVideo as well.

XI.2 A Typical Playout Session

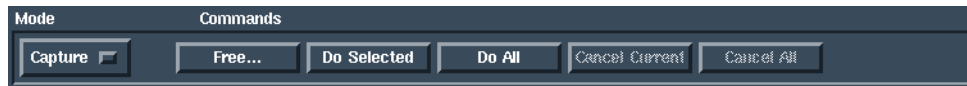
A Playout Session is very similar to capture – first, a job list is created. This can be done:

- Manually, by dragging clips from the Loader to an empty job list entry, or by typing in a name of an existing clip, or by using a file selector box through clicking the button labeled ‘...’ at the top of the job list.
- By performing a “Render & Save to tape” operation in Jaleo. This will check the reel content for sections that need to be rendered, then render the necessary segments, and create a job list suitable for dumping all the segments to tape. This job list can be loaded into RtVideo using the Load... command on the File menu.

Just like in capture mode, Do All and Do Selected can be used to conform all the list or any part of it.

A free run mode without machine control is available in playout mode as well.

XI.3 RtVideo Modes and Commands



RtVideo can be operating in one of two basic modes:

- **Capture.** This mode is used to save imagery and audio coming from the video/audio input of the machine to the disk (video to the XFS array, audio to systemdisk).
- **Playout.** This mode is used to output imagery and audio from the disk to video/audio outputs of the machine (video from the XFS array, audio from systemdisk).

The operating mode is selected with the popup menu at the left of the mode/command bar of RtVideo. In the illustration above, it shows Capture mode. The mode selected is shown in the header line of the job list.

In both major modes, normally you use a job list and frame accurate machine control to capture or playout sequences. For this to work, RtVideo must be able to talk to the machine control unit (VLAN) and to the VTR. If any of these parts is not configured operating properly, RtVideo will not operate frame accurately.

XI.3.1 Free Run Command

It is also possible to operate in free run mode. In free run mode, RtVideo does not attempt to control a VTR connected. Instead, it captures on the fly whatever is incoming through the machine inputs (in free run capture mode) or plays out on manual command (in free run playout mode).

Free run operation is activated by pressing the “Free...” command button. This will open up a small dialog that permits to control free run operation in the respective mode. Free run mode is explained in “Free Run Capture or Playout” on page 53.

XI.3.2 Conforming Lists

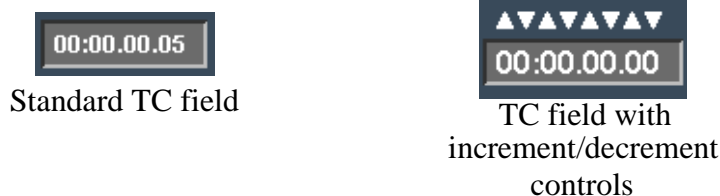
A complete list or any section thereof can be conformed using the Do All respective Do Selected command. While Do All performs all entries in the list, Do Selected only performs the entries currently selected. When performing lists, at the right edge of the list, status of execution is displayed.

XI.3.3 Cancelling Operations

The Command button line also includes two buttons to cancel all operations or only the current operation. If you press Cancel Current during a conforming operation, the current job will be abolished, but RtVideo will continue with the next entry in the list. If you press Cancel All, processing of the list will be completely terminated, with all remaining jobs left undone.

XI.4 Time Code Fields

In RtVideo, there is a variety of time code fields for entering and modifying timecode. These fields have a bit more functionality than visible on first look. There are two types of timecode fields:



These two fields only differ by the additional increment/decrement arrows the larger version has – all other functions are identical.

XI.4.1 Entering and Modifying Timecode

You can enter time code in various ways:

- Select the full text in the window. Now enter the timecode as desired (which will overwrite the value in the field) or press Backspace to clear the window. You can leave out leading zeros, i.e. you can type 5:10 instead of 00:00:05:10.
- You can select and edit any sub-part of the TC value and overwrite it, as described above.

- You can point on any section (i.e. hours, minutes, seconds or frames) of the time code and drag the mouse upwards or downwards with the left button pressed. This will increment or decrement the value of the section depending on how far you move the mouse.

The TC field with the increment/decrement arrows also allows you to click on the little arrows to modify the respective section values in steps of one.

XI.4.2 Registers

Each time code field has 7 memories for time code positions. This can be useful if you quickly want to test a different set of values, as you do not to re-enter values afterwards.

To store a value in memory, click on the field with the right mouse button. A popup menu appears that either includes a number of TC values and the menu entry Keep, or only the entry Keep if no previous values were stored. By selecting Keep the current value is added to the memory of the field.

To restore a setting, click the field with the right mouse button and select the value you wish to restore.

XI.4.3 Drop Frame Timecode

If RtVideo is operating in Drop Frame mode (i.e. if the current tape is a drop frame tape), timecode values can be Drop Frame TCs. These are distinguished by displaying either semicolons or simple dots as section delimiters in the TC value. That is: 00.03.04.12 instead of 00:03:04:12.

About timecode values expressing a **position**: if you enter an invalid timecode value in a field expecting a Drop Frame TC value, the value entered will be converted to the next (nearest) valid timecode value.

Note that **duration** values are represented in drop or in non-drop values, according to the operating mode of the RtVideo module.

You can select dots or semicolons as delimiters in the Setup menu.

XI.5 The Joblist

XI.5.1 General

The job list contains any number of entries that describe RtVideo capture or playout actions. Each entry contains all the necessary information for RtVideo to be able to perform the operation. On entry of the values, error checking is performed. For example, RtVideo will refuse to playout a non-existing clip, or it will warn if you attempt to capture over a clip already present.

Separate job lists exist for capture and playout. The mode currently selected is displayed as the header line of the job list area in the RtVideo window.

Entry Details

For playout and capture, entries in the Job list can have some additional detail information attached which is displayed in an area directly below the job list. These details include additional handles for the clip.

Edit Modes

The job list supports three edit modes: normal, ripple and consecutive. In normal mode, each entry can be edited independently. In “ripple” mode, inpoint changes of one entry will “ripple” through all entries following the entry marked. In “consecutive” mode, only the first entry can be edited, all others are set automatically to be consecutive, without spaces inbetween.

The mode currently selected is displayed in the header line of the job list area in the RtVideo window.

Multiple Jobs Performed in a Single Edit

RtVideo is capable of performing multiple list entries using a single edit to the VTR if these entries are consecutive in time on the tape. This speeds up operation considerably.

Selected and Active Entries

List entries can be selected – this means they will be used whenever a Do Selected command is performed. Selected list entries show a white checkmark to the left of the list entry. If the entry is not selected, the checkmark appears grey.

To select or deselect an entry, click on the checkmark. This will toggle the selection state. If you hold the Shift key while clicking on a toggle, the selection state of other entries in the list will not be affected. That is, to selectively add or remove entries to or from the selection, hold the Shift key while clicking on the checkmarks.

Another important concept for list editing is the Active Entry. Only one list entry can be active at any given time. The Active entry is denoted by a red rectangle drawn around it.

The active entry is the entry that is currently being modified. If you use any of the list modification buttons explained below, the active entry is the one that changes.

To activate an entry, click in any of its timecode fields.

List Modification Buttons

The header line of the job list shows the labels for the list's columns. Three of these labels are actually buttons:

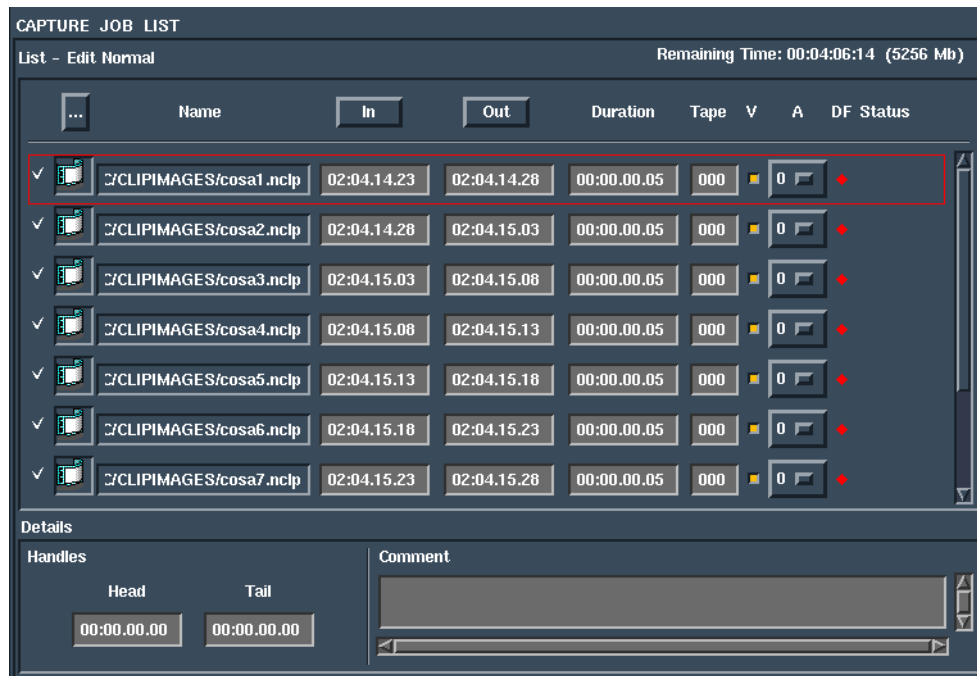
- Above the name for a jobs clip, there is a button labelled "...". pressing this button opens a file selector box that allows you to select another name for the active entry's associated clip name.
- Above the inpoint you can find the label "In". Pressing this button copies the value from the current tape position to the active entry.
- Above the outpoint you can find the label "Out". Pressing this button copies the value from the current tape position to the active entry.

Adding Entries to the List

To add a new entry to the list, you can use the Add Entry button from the Edit menu (there is a keyboard shortcut for it). This will create an empty entry. In capture mode, if you have entered a default base name for clips in the setup menu (see "Job Name..." on page 58 for more information), the name field will be pre-filled with the base name plus a number, so that you do not have to enter names manually. Once you have an entry, you have to set the in- and outpoint values as desired.

Alternatively, new entries can be created using the "Add" button at the side of the shuttle area. This button will create a new entry using the current values of the in- and outpoint register. In capture mode, if a base name has been set up, the name also will be preset. If you use this method, you would first search for the right spots on tape, then press Add to create a new entry. See "Command Buttons" on page 52 for more information.

XI.5.2 Job List for Capture



For capture, a job list entry contains:

- a name field. If you enter a name here that already exists as a clip, the system will warn you that this would result in an overwrite. You can drop files for example from the Loader in the drop pocket to enter an already existing filename, if this is desired.

If you have set up an automatic base name (see “Job Name...” on page 58 for more information) then each new entry will have a name automatically assigned to it that you of course can modify or replace.

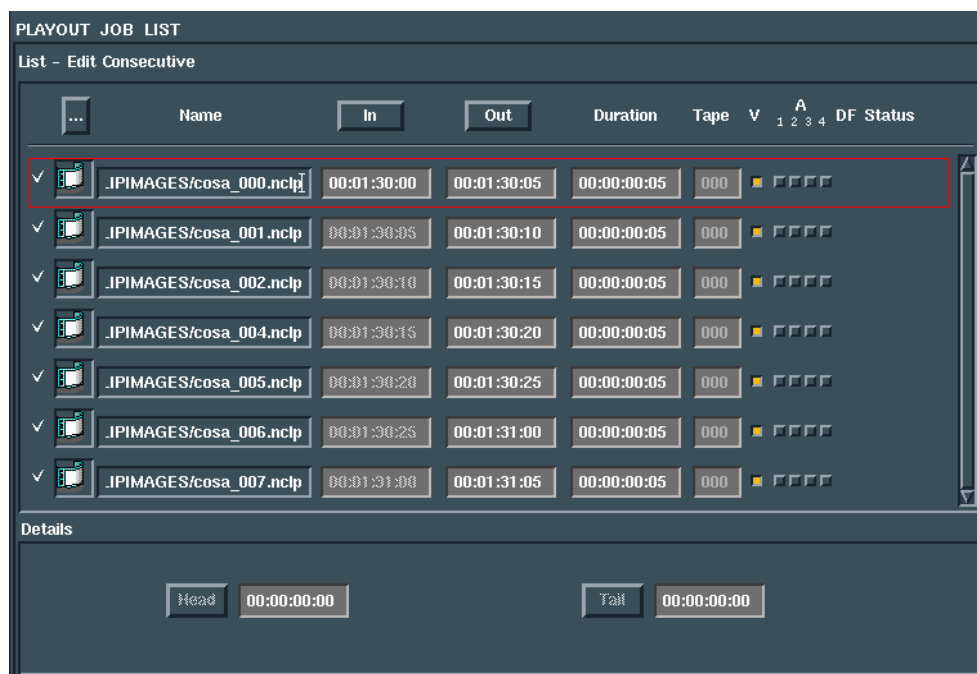
- in- and outpoint settings. To modify the outpoint, you can also change the duration field – both values are internally connected.
- a duration field. To modify the duration, you can also change the outpoint field – both values are internally connected.
- tape ID. The reel ID is used to identify which tape is in use, and to distinguish if jobs in the list refer to different tapes. If you enter a new tape, RtVideo will normally detect the tape change and ask you for the reel ID of the tape entered.
- Video track toggle. This determines if video will be captured.
- Audio track selector. You can capture 0, 1, 2, 4 or 8 tracks of audio as you go.
- Drop Frame indicator. This shows a red mark if the job refers to a tape with drop frame timecode, and white if it does not.

- Status. The status field gets updated while a job list is conformed.

In capture mode, the following details can be added to an entry:

- A head and tail handle. This permits to capture additional material before and after the in- and outpoint set.
- A comment can be added to each entry. This entry appears in the Attribute window of Jaleo when the clip is selected in the Reel.

XI.5.3 Job List for Playout



For playout, a job list entry contains:

- a name field. If you enter a name here that does not exist, the system will refuse the entry. You can use drag&drop from the Loader to place clipnames here.
- in- and outpoint settings. To modify the outpoint, you can also change the duration field – both values are internally connected.
- a duration field. To modify the duration, you can also change the outpoint field – both values are internally connected.
- Video track toggle. This determines if video will be played out.
- Audio track toggles. These toggles determine which of the four audio tracks of a VTR will be placed in record mode when the edit is performed. It does *not* determine which audio tracks will be played – this is determined by the routing settings active for the

given clip. A clip always will playout all the audio tracks that it contains, routed as determined by the audio routing you have chosen in Jaleo. How the physical outputs of the machine (2 or 8, depending on which mode you use) are connected to the inputs of your VTR is up to the audio wiring at your site. In many cases, you will have either a mixer or a routing matrix connected between the Octane and the VTR, to provide for the necessary physical routing, or you will have a certain configuration hard wired.

- Drop Frame indicator. This shows a red mark if the job refers to a tape with drop frame timecode, and white if it does not.
- Status. The status field gets updated while a job list is conformed.

The following details are available for playout:

- Limits, head and tail. Normally, if you drag a clipname into a new entry, Jaleo will assume you wish to playout the complete clip. With these fields, you can trim head and tail of the clip.

XI.6 Shuttle Area



The shuttle area is made of two subsections:

- Shuttle Controls
- Registers (memories) for in and outpoint locations, as well as command buttons

XI.6.1 Shuttle Controls

Shuttle controls are used to control a connected VTR. Also, in playout mode, the active list entry can be played back from disk, as a preview.

Mode Select

At the left at the side of the timecode display, there are two mode pop up menus, which control if shuttle controls are used with a clip or the VTR. Both are only active in Playout mode; in capture mode, shuttle controls always control the VTR.

The playout mode can be either video or clip; in video mode, the VTR is controlled, in clip mode the active clip is played back and controlled.

The lower mode button is only active in clip mode; it controls if the clip is played back single shot, looping, or swinging.

Time Code Display

The time code display shows the current position of the VTR. In clip mode, it shows the position in the clip. At the right, current VTR status is displayed.

State is updated during edit operations – only during preroll no updates are displayed.

Shuttle Controls

The shuttle buttons, from left to right are:

- Go to start of tape (or clip)
- Fast Rewind
- Play Backward
- Single Frame backward
- Stop
- Pause
- Single Frame Forward
- Play
- Fast Forward
- Go to end of tape (or clip)

Below the shuttle buttons, there is a shuttle bar. This allows to shuttle through the tape with variable speed, similar to the operation of a VTR.

XI.6.2 Registers

The Register area is made of two time code fields with Set and Go buttons, one for In points and one for Out points. As explained in “Time Code Fields” on page 44, each of the fields can store various positions that you can recall easily.

Located below the time code fields are command buttons that allow you to create a new list entry using the current values of the registers, or to modify the active list entry using the in or out register, or both.

Registers

The Set button of each register sets the current value of the register to the current position shown in the shuttle timecode display.

The Go button causes the VTR to move to the current register position.

Please remember that the registers can keep multiple positions in memory. Just click the right mouse button on the field and use the Keep button from the pop up menu appearing to save a value to the field. To retrieve a value, press the right mouse button again and select the desired value from the pop up menu.

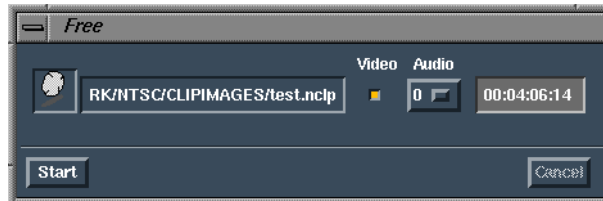
Command Buttons

The command buttons operate as follows:

- **Add.** Creates a new list entry using the value in the in and out register. In capture mode, if a base name has been set up, the name also will be preset. If you use this method, you would first search for the right spots on tape, then press Add to create a new entry.
- **M(odify) In.** This copies the current value of the in register to the inpoint value of the active entry.
- **M(odify) Both.** This copies the current values of the in and outpoint register to the in and outpoint of the active list entry.
- **M(odify) Out.** This copies the current value of the out register to the outpoint value of the active entry.

XI.7 Free Run Capture or Playout

XI.7.1 Free Run Capture



If you select the Free... button in capture mode, the dialog shown above comes up. From the left to the right, it has a field for the file name for the capture, toggles for video and audio track selection, and a timecode field that shows the maximum time available for capture, depending on disk space.

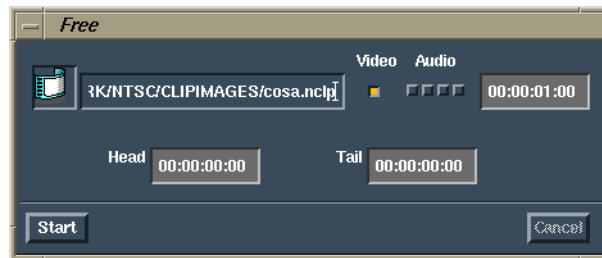
To perform a free run capture, enter a name in the name field, then select video and the number of audio tracks desired. You can optionally modify the maximum capture length – this is for example useful if you want to capture a single image in free run mode. To do this, just set the value in the capture time field to 00:00:00:01. Of course, any fixed capture length up to the maximum can be set.

To actually start the capture, press the start button. RtVideo will capture whatever comes into the machine until you either press Cancel or the maximum capture time set is reached.

Warning:

Before pressing start, make sure there is a video signal coming in to the machine (using the monitor window, Monitor>1:1 or 1:2). Otherwise, the machine may block.

XI.7.2 Free Run Playout



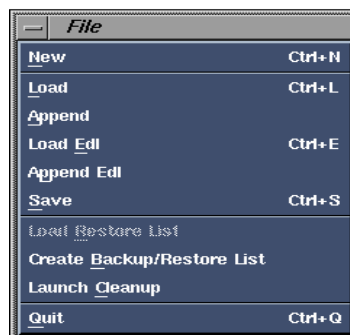
In playout mode, the free run dialog looks as shown above. To perform a free run playout you can either type in a name of an existing clip, or you can drag&drop a clip from the Loader. There are toggles for selecting which tracks are to be placed in record mode on the VTR, just like in the job list. The total length of the clip selected is shown to the right of the track toggles.

If you do not want to play out the entire clip, but only a subsection of it, you can trim the clip using the head and tail controls.

RtVideo starts playing out the selected clip as soon as you hit the start button.

XI.8 RtVideo Menu Commands

XI.8.1 File Menu



New

Clears both capture AND playout job-lists (both lists are deleted).

Load

Loads a list for the current job list mode. In capture mode, the list files have the extension . jIn, in playout mode . jOut.

Append

Appends a list to the currently loaded job list (keeping currently loaded jobs).

Load Edl

Permits to create a job list from a standard edit decision list. Selecting this command brings up a file selector dialog that permits you to choose an EDL file. The default location for EDLs is the current project's EDL directory, but of course you can change the path of the file selector to any place on disk.

Loading an EDL does not only create a capture list for Jaleo, it also creates an environment file containing the information of the EDL. This file can be opened directly in the Reel.

The file selector for loading a file allows you to set:

- A base name for the clips to be captured. All clips loaded will have the base name with an appended number.
- A name for the environment to be created
- Handles for head and tail of the clips captured. You always should capture EDLs with certain amount of extra space, as this ensures that edits in the EDL can be trimmed afterwards.

Append Edl

Appends an EDL to the currently loaded EDL (keeping currently loaded jobs).

Save

Writes out the current job list to a file. Keep in mind that the capture and playout job lists are independent and must be saved separately. Saving only saves the job list in the current mode.

Load Restore List

Loads a special capture list created by the Create Backup List command. These lists are used for quickly backing up and restoring material to video. See "Using RtVideo for Backup and Restore" on page 60 for more information.

Create Backup/Restore List

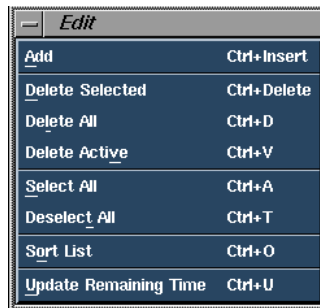
Creates a special playout list used for creating backups of video material to tape. Also creates a matching restore list that can be loaded with Load Restore List, and the necessary information to delete backed up material (used with Launch Cleanup). See "Using RtVideo for Backup and Restore" on page 60 for more information.

Launch Cleanup

Deletes material files associated with a previously created backup. This command will only work if you previously created a backup and restore list with Create Backup/Restore List.

WARNING: Use this command with care as it will delete material **permanently**. See "Using RtVideo for Backup and Restore" on page 60 for more information.

XI.8.2 Edit Menu

A screenshot of a software menu titled "Edit". The menu is dark blue with white text. It contains eight items, each with a keyboard shortcut to its right. The items are: "Add" (Ctrl+Insert), "Delete Selected" (Ctrl+Delete), "Delete All" (Ctrl+D), "Delete Active" (Ctrl+V), "Select All" (Ctrl+A), "Deselect All" (Ctrl+T), "Sort List" (Ctrl+O), and "Update Remaining Time" (Ctrl+U).

Add	Ctrl+Insert
Delete Selected	Ctrl+Delete
Delete All	Ctrl+D
Delete Active	Ctrl+V
Select All	Ctrl+A
Deselect All	Ctrl+T
Sort List	Ctrl+O
Update Remaining Time	Ctrl+U

Add

Creates a new, empty entry in the job list.

Delete Selected, All, Active

Deletes the selected entries, all entries or only the active entry from the list.

Select All

Makes sure all entries of a list are selected.

Deselect All

Makes sure all entries of a job list are deselected

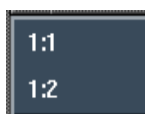
Sort List

Sorts a list so for Reel-ID and then for inpoints. Thus makes sure that optimal efficiency in list performance is achieved.

Update Remaining Time

Forces an update of the remaining time on the disk array.

XI.8.3 Monitor Menu



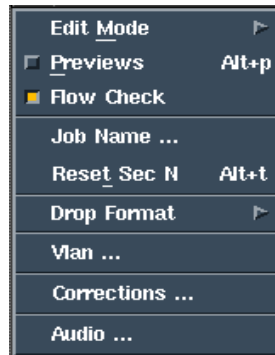
1:1

Opens a full size video monitor showing the incoming video signal.

1:2

Opens a half size video monitor showing the incoming video signal.

XI.8.4 Setup Menu



Edit Mode

Submenu to choose the edit mode for the list. A list always is in one of three different edit modes:

- Normal. In normal mode, each entry can be changed completely independently.
- Ripple. In ripple mode, changes in inpoint applied to one entry are propagated to the inpoints of all entries following the entry modified (example: if you move back the inpoint of an entry by 1 second, all following entries are also moved by 1 second). In capture mode, rippling does only affect entries with the same reel ID as the one modified. Contrary to this, in playout mode, *all* of the list will change.
- Consecutive. In consecutive mode, you can only edit the in-point of the first entry. All other entries are automatically positioned to be consecutive. Please note that this mode is only active for playout.

Previews

This toggle determines if RtVideo creates preview images on capture. If this is deactivated, RtVideo will not create low res proxy clips for imagery captured. This results in faster capture operation. Jaleo will then create previews on the fly whenever they are used. Also, in Jaleo you can create proxies in a file on demand. See also “Preview Generation on the Fly and Preview Regeneration” on page 15.

Flow Check

With this option enabled, RtVideo will check during capture and playout operations for errors associated with disk operation getting to slow for whatever reason. Jobs where such an error occurs will be marked in the status field of the job list with an Underflow or Overflow message, after execution.

In some cases, ignoring this type of errors will give perfectly usable results. If you experience underflow or overflow errors, you should try the entries that failed again with Flow Check disabled.

Normally, Flow Check should be enabled.

Job Name...

Opens up a dialog to enter a base name for automatic clip naming. If you enter a clip name here, new capture list entries created will have a name preset in the name field, consisting of the name you entered plus a number. Numbering will start with 1. If you use `my_clip` as base name, clips will be named `my_clip1`, `my_clip2` and so on.

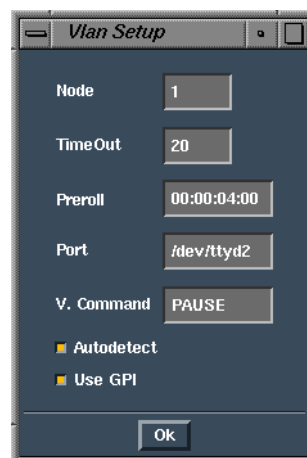
Reset Seq N

resets the numbering of the clip auto-naming. After selecting this command, clip numbering will again begin at 1.

Drop Format

With the this submenu, you can choose if dots (.) or semicolons (;) are used as delimiter for drop frame timecodes.

Vlan



The following settings must be made to run RtVideo successfully:

- **Node:** The VLAN node to be used. Set this to the node number assigned to the VLAN receiver you use. Normally 1.
- **Timeout:** The delay after which RtVideo assumes a communication error to the VLAN has occurred. Some devices connected to VLANs react very slowly; in this case, larger timeout values than the default may be desirable.
- **Preroll:** Set this to the preroll required for your VTR. Must never be shorter than 3 seconds.
- **Port:** The serial port of your machine where the VLAN is connected. Note: Make sure the port has the right permissions set.
- **V. Command:** This field is the status message that RtVideo expects the VTR to send after a tape change. Normally this should not need change. On an exotic device, a different status might be set automatically after a tape change; in this case set this to the value used by the device.

- Autodetect: Determines if RtVideo attempts to detect tape changes automatically.
- GPI Trigger: Normally this should be activated. Determines if the GPI trigger from the VLAN is used to obtain frame accurate results.

Corrections



The correction values are used to adapt for machine dependant delays in the system. You can move audio and video back and forth about the given point, to adjust that both begin at exactly the right frame (the inpoint on tape).

A good way of testing this is to create a clip using rotopaint which has numbered frames, for example from 1 to 50. Then add visible flashes to the first and last frame. Now, add short audio “pings” or clicks to the first frame, frame 25 and the last frame. Render the result to a single clip with audio.

In RtVideo, first adjust payout. If the correction settings are correct, the played out clip should start exactly at the inpoint with the frame you painted a 1 on, and it should end at the out point with the last frame you painted. The audio pings should be at the right spots when listening to video.

If the payout result is not OK, you can use the correction dialog to shift video and/or audio. Before you do so you should check payout a few more times to see if the error is fixed or variable. If the error is variable, it is extremely likely that you have not connected proper sync signals to VLAN, Octane or VTR, or that some other setup is incorrect. See the Installation and Setup Guide for more information on proper video and synchronisation setup.

Start with finding correction values for video.

- If video is late, you will see a number of green frames before the clip starts. Count the green frames, and put the same number, but negative in the Payout Image correction field. If for example you get 4 green frames, put -4. This will shift video to begin earlier.

- If video is early, you will see that at the inpoint (on tape) you do not have the first, but a later frame. To correct for this, count how many frames video is early and enter the appropriate number in the correction field. In case of the clip with the numbered frames, if you for example get 5 as the first number, video is four frames early (if the first frame was painted with 1), so you would enter four in the box.

Once you get repeatedly correct results for video, adjust audio using the same technique.

If you are done with adjusting the values for playout, proceed to adjust capture. To do so, simply try to recapture the “correct” version of the clip played out. Load the result clip in the Reel or the Loader and compare it with the original played out. To compare audio it is often useful to break the audio away from the video and to compare the icon representations of the audio frame by frame. Short clicks are normally well visible that way.

Audio

Brings up the standard Jaleo audio setup dialog. See the Installation and Setup Guide for more information.

XI.9 Using RtVideo for Backup and Restore

XI.9.1 Introduction

RtVideo includes functions to quickly move video material stored on the XFS array to a video tape, as a backup. It can then delete the material from the array, and later restore the material by recapturing.

The mechanism works by creating playout, capture and deletion lists for all files of the current project that are stored on XFS and are stored in a real time capable format (YUV). The lists can then be used to perform quick storage and retrieval to and from video.

Note that the backup/restore process integrated in RtVideo does *only* back up real time playable material found on the XFS device. All other project data and metadata (basically, all the data stored in the project’s directory in the Jaleo WORK) directory must be backed up as well, or remain untouched, in order to later reuse backed up material. Even if you are planning to leave the data untouched on your computer’s hard disk (metadata typically is rather small) you should always make a backup for security reasons. A high speed tape subsystem is recommended for this purpose. To do the backup of the extra data, you can use either standard tools supplied with IRIX (command line or graphical) or commercial backup/restore products.

Important Note:

As video tapes may have drop outs or other problems, it is a good idea to make two backups to different positions of the same video tape, or to two different tapes. Use two different backup lists for that, with different names (for example `ProjectName_bck1`, `ProjectName_bck2`).

The process of backing up and restoring works as follows:

- In RtVideo, change to playout mode and use the command File>New
- In NTSC only, to enable Jaleo to detect Drop Frame status, insert the (first) backup tape into the (D)VTR.
- Use the command File>Create Backup/Restore List to create the playout, capture and deletion lists. The backup list will automatically be loaded; you will be prompted to enter a starting TC value for this backup (the location on tape where the backup will start).
- Select Do All to actually store the material to tape. *Do not omit this step* – the Create... command only creates the necessary lists, but it does *not* execute them automatically.
- Check completion status of the operation carefully. Also check the video tape if you can, as tapes may have drop-outs or other problems.
- If so desired, repeat the previous steps to create a second backup.
- Delete the material backed up using the File>Launch Cleanup option. This option will warn you to make sure you have created a proper backup before proceeding. Once you confirm deletion, the XFS device will be freed of the material contained in the backup. Deletion will affect both hires and preview material.
- The operation so far has copied all realtime capable material for your project to video. However, the audio and metadata (clipfiles, environments, audio, Plug in data etc.) is still on your computer disk. You have various options for what to do with this metadata:
 - In many cases, the metadata is so small that you can easily leave it on disk for a large period in time. But even if you do not need to delete the metadata to create space on disk, you *always* should create a backup of this data, for security reasons.
 - If you wish to delete the metadata, or if you just wish to backup the data for security, you can use any of the standard UNIX backup tools coming with your SGI (some are command line based, some can be called from the file manager desktop interface). Also, there are various commercial backup and restore tools available.

For guidelines on backing up your audio files see Section XI.9.3, “Notes about backing up Audio,” on page 63.

- Once you need the project again, first restore the metadata to the Jaleo WORK directory. Make sure that the owner and permissions are set correctly after the restore.
- Open RtVideo and change to capture mode.
- Select File>New
- Load the restore list for your project by selecting File>Load Backup

- Setup the Preview Creation status to the desired state.
- Autoconform the list.
- You should now be able to use your project just as it was before backup.

XI.9.2 Command Description

Create Backup/Restore List

To use this command:

- Make sure RtVideo is in Playout mode.
- Insert the backup tape to enable Drop Frame mode detection (NTSC).
- Clear any existing list by selecting File>New
- Select File>Create Backup/Restore List

Create Backup/Restore List asks the operator for a name for the backup file, and a tape offset to be used for the backup on video tape. Then, the command actually performs a variety of actions:

- It creates three files: the backup list, a matching restore list and a deletion script that will clean out all the files on the backup list. The lists contain all high resolution files on the XFS device that are capable of real time playback, that is, basically all YUV-formatted clips.
- It loads the backup list created to the job list area.

You must still launch the performing process of the list created manually. *Merely creating the list does not create the back up!*

Looking at the list created, you may note that the clip file names listed do not necessarily match the clipfiles you had originally. The reason for this is that Jaleo clipfiles can refer to material with completely different names. The clipfiles in the list are pure “dummy” names that are of no relevance.

You *must* back up the project’s metadata as well if you wish to be able to reuse material in the context of a project again. This can be done with any standard UNIX backup/restore tool, or with a commercial backup/restore product.

Launch Cleanup

Once you have created back up and restore lists and actually performed the backup (remember, creating the back up lists does not mean that the material is already safe – *you have to conform the list*), you normally wish to free up space on your disk array.

For this purpose, RtVideo creates a script to delete the files of the backup from the disk array alongside with the backup and restore list. You can have RtVideo run this script by calling up the command `File>Launch Cleanup`.

Launch Cleanup will ask you to verify that you indeed have made the backup before proceeding. It will, if asked to proceed, delete both high res and low res movies for all clips backed up.

Restoring: Load Backup

The Load Backup command loads a restore list previously created with Create Backup/Restore List. To use it,

- Switch to capture mode
- Clear the list by selecting `File>New`
- Load the restore list with `File>Load Backup`
- Conform the list with `Do All`

Note that the restore list contains dummy clip names created in the process. These files can be discarded. The file names of the XFS material files will be exactly as they were before the backup/deletion, so that your original metadata (which you either preserved on the disk or restored previously to restoring the material, see above) will be able to use the material as if it never had been deleted.

XI.9.3 Notes about backing up Audio

The backup and restore tools will act on the high and low-res YUV-based materials (sitting in the XFS disk array) ONLY. This means that audio files, as well as metadata, should be backed up separately.

As you may wish to backup the metadata contained in the WORK directory, doing a (recursive) backup of all materials in a project directory will also backup the audio files for that project.

As an example we take the situation where the Jaleo software installation made was done under the name 'jaleo27', and the project to be backed up is named 'TEST'. As the WORK directory is located under `/usr/people/jaleo27/WORK`, the project directory is located under `/usr/people/jaleo27/WORK/TEST`, and the audio files for this project can be found in the directory: `/usr/people/jaleo27/WORK/.SOUNDSRC` (please note the dot in `.SOUNDSRC`, actually depicting a hidden directory). You can now backup these files separately, or as part of a backup of the project directory, or even as part of a backup of the complete WORK directory.

Backing up these files can be done through any standard IRIX utility (like tar), or through third party backup software. Recommended backup media are high-speed tape (like DLT) or writable CD.

XII. MISCELLANEOUS

XII.1 Pulldown Removal and Rendering

With Jaleo 2.7, you can remove 3:2 pulldown from material, or render an effect or clip adding 3:2 pulldown. Both options work just like Render Selective, that is, they create a new clip that is placed on top of the clip selected for rendering.

To remove pulldown, you have to help the system find the “phase” of the material. To do so, use the Active Monitor to find a transition between a frame that contains two interlaced images of the cine sequence, and a proper frame. Leave the active monitor on the proper frame, i.e. the first stable frame after an interlaced one (if you have a frame sequence like AA BB BC CD DD you would leave the monitor on a DD frame). You can see this if your Active Monitor is switched to Hires **and** Freeze -> Frame mode and is monitored on the Live Video Out – the mixed frames will expose strong flicker while the proper ones are stable. If you wish to use the workstation monitor, you can use all monitor features like zoom and pan if desired.

Once you have found a proper start frame, make sure the clip you wish to remove the pulldown from is selected and choose Clip>Pulldown Removal. This will open a dialog identical to the Render Selection dialog. You can now enter a name for the clip to be created, as well as select a storage format to place the clip. As a result of the render, a shorter clip will be placed on top of the selected clip.

To render with pulldown, select the clip or effect you wish to render with 3:2 pulldown. Now select Clip>3:2 Pulldown Render and enter a clip name and storage destination (if desired). The result of the render will be larger than the selected effect or clip. Note: The pulldown render will always start with an AA frame.

XII.2 Live Project Switches

Using the project manager, it is now possible to switch the current Jaleo project without restarting Jaleo. All file selector or Loader windows automatically update themselves and change to the new directory.

XII.3 Audio Waveform Option in Monitor

The monitor popup menu now has an additional option to switch to audio waveform display. In this mode, audio waveforms for the up to 8 tracks of the clip are shown instead of images.

XIII. REALTIME FX REFERENCE

Principally, real time effects in Jaleo Octane work just like normal effects. However, real time performance depends on the material used to drive the effects. Normally, video material captured by the system is stored just as it comes into the machine, i.e. in YUV 4:2:2 CCIR 601 quality. The real time effects operate directly on this material without any conversion.

Jaleo also permits to store material in RGB or RGBA, but this generally makes real time execution of an effect impossible. During normal work with a Jaleo system, there is very little need to store material in RGB or RGBA.

Note that most other Jaleo effects generally operate in RGB color space. Therefore, adding an effect from the real time menu on top of an effect stack using other Jaleo effects will cause the effect to operate in RGB, thus not in real time¹.

Therefore, if you use real time effects to get execution in real time, use material stored in YUV on a suitably configured disk array. All material normally captured by Jaleo is in this format, so there is no special thing to worry about, unless you import material from computer graphics source or similar.

If you use real time effects stacked on top of each others, the output of the first effect will also be YUV to make sure that real time performance can be retained. Quite a number of real time effect combinations still give real time, for example a color correction plus a composite with chroma key.

Real time effects can be used just like any other Jaleo effects. The real time effects can be found:

- In the new menu entry “Fast FX” on the main reel menu
- Dissolve and Library Wipes automatically switch to real time operation if used with appropriate material
- In the Key menu, the top entries for Composite and Composite/Chroma select preset configurations of the real time compositing/keying effects as a more convenient and powerful replacement for the previous functions in this spot.

1. Jaleo is optimized to minimize color space conversions, and to do them, where necessary, in the best possible quality. Therefore, we store material exactly as it physically comes into the machine, only converting it when necessary. This also permits to use a high quality software conversion algorithm instead of the hardware convertor built into the video board. If material is used inside a processing stack, care is taken that material is never converted more than once. Note that YUV 4:2:2 storage also makes use of disk space 50% more efficient.

The following sections describe some details on operation:

XIII.1 Dissolves

The standard linear dissolve (with one or two inputs) works just like the standard dissolve. There are no changes. Also, the Non-Linear Mix works in real time.

XIII.2 Wipes

Real time performance can be expected from the Library wipes in the DVE section, with the exception of the Circle wipe.

The Wipe effect works just as normal. However, using extreme softness in a wipe can cause the wipe to lose real time execution.

XIII.3 Feedback

The feedback effect from the FX menu works in a real time effect environment just as with the normal effects.

XIII.4 Color Correction -RT

Provides parameters of color correction most familiar to video postproduction users, similar to a video mixer.

Inputs:

Uses one input.

Parameters:

- **Luma:** Luminance factor. The value can be set to negative values, what makes it possible to create luminance negatives (i.e. with a value of -100); use negative luminance in combination with black levels of e.g. +100.
- **Sat:** Chroma saturation. Can be set to negative values to produce chroma negative. A value of zero (0) produces black-and-white effects.
- **Black:** Black level of luminance. Offsets overall luminance of image.
- **Hue:** Rotates the hue of the image, in degrees. A value of 360 means a complete spin, returning to the original colours.

- **BitsLum:** Determines how many bits of luminance signal are used. 8 means that the full range is used, i.e. 256 levels of luminance. Each lower value means to cut the number of levels by half – i.e. 7 means 127 levels, 6 is 64, 5 is 32, 4 is 16 and so forth. This is equivalent to posterization.
- **BitsCroma:** The same effect for the Chroma (U and V) part of the image.
- **TintHue:** Allows tinting image, offsetting the chroma in this direction. The overall image color is shifted toward the color hue selected. By setting Saturation to zero and then using Tint we can create a one color shaded image (e.g. yellow).
- **TintInt:** Intensity of tinting.

XIII.5 Color Vector Correction (Color Remapping)

This new color correction effect allows to select a source color (for example by picking from the image using the color chooser window) and a tolerance, and to remap this color to any other color. It is very similar to the SixVecB PlugIn, with the difference that it takes a single vector which is freely definable instead of seven predefined ones.

Inputs:

Uses one input.

Parameters:

- **HueSrc:** Hue of the color to be substituted. Can be set most easily by using the color chooser's pick tool, which permits to select the desired color either from a monitor window or even the small clip thumbnail in the reel.
- **HueApp:** The hue range to be substituted. Lower this value to apply the substitution more selective, raise it to correct a wider range of tones.
- **HueDst:** Destination color hue. Select the hue the selected source color will be transformed to. Can be set most easily with the color chooser's color wheel. If the HueDst parameter is selected in the time editor, you can also edit SatDst in the color chooser, using the saturation slider, without having to select it separately.
- **SatDst:** Destination color saturation. Values over 100 allow to get resulting color more saturated then the substituted color was. If the HueDst parameter is selected in the time editor, you can also edit SatDst in the color chooser, using the saturation slider, without having to select it separately.
- **LumDst:** Destination color luminance change. By default, the substituted color will not change its luminance. Growing or lowering this value, the destination colour luminance can be varied.

XIII.6 Composite with Chroma

The effect CompCR creates a Composite of a background and a chroma shot. The parameters used for keying are very close to those found in a classical video mixer. That is, the key is specified via a color in the color wheel (hue), a tolerance, and clip and gain values. The effect can also be used with a single input; it then just extracts the key image.

Inputs:

If used with two inputs, the first input layer is the background, the next one the chroma shot to compose on top of it.

If used with a single input, a key is extracted from the images.

If used with three inputs, this effect works as a difference keyer. When working in this mode, the so-called ‘shrink’ parameter does not work.

Parameters:

Key Parameters Folder:

- Hue: The medium hue of the chroma screen.

You should set this value using the Pick Editor’s Pick Color button. Drag a large rectangle over the chroma background to get a good average of the color hue. See “Quick Key Setup – Pick Editor” on page 18 for more information.

- HueApp: The width of the wedge segment in the color wheel – in effect the range of colours around the hue interpreted to be still background. A wide angle of 180 is usually OK for blue screen shots, while for green screen shots it should be reduced to about 90 degrees. You should set this value before setting up Clip and Gain.
- Gain, Clip: These function as usual for the keying functions.

You can now use the Pick Editor to set up these values (Pick Transparent and Pick Solid buttons). See “Quick Key Setup – Pick Editor” on page 18 for more information. You can also use the Histogram in the Pick Editor.

- Shrink: Subpixel horizontal shrink of 0..1 pixels. Can fix key outline problems.
- MixKey: Allows to blend in the foreground. 0 means fully transparent foreground, 100 means solid foreground.

Correct Folder:

- Color correction works very like the ColCorVec filter. It substitutes the screen hue by a new color defined by hue, saturation and luminance. The source hue is defined by the Key/Hue parameter (i.e. the hue selected for keying is used), and therefore does not need to be set up here.

- **AppCor:** Range of the colours to be corrected. Typically, a good value for blue screens is around 300, and 180 for green screens. Use lower values to get a wider range of uncorrected foreground colours FG colours, or higher values to get stronger spill correction.
- **OfsColor:** Improves spill suppression by tinting gray tones in the FG towards a hue contrary to the one screen selected as chroma screen hue. Use this parameter if you can not get rid of gray tones in the suppressed areas, as for example seen with blond hair in front of a blue screen. Small negative values of -5 to -10 should be used.
- **HueCor, SatCor, LumCor:** Destination colour of the spill correction. By default it have saturation value of zero, so converts the BG color to gray. Can be easily manipulated in the color editor, exactly like in the ColCorVec effect. Try to fit a medium FG colour here. You may wish to use the colour chooser's colour pick to select the destination colour.
- **Crop:** Can be defined in the Pick Editor tool (Pick Crop). Everything outside the defined area is considered transparent and only the background is seen there. It also accelerates processing as the processed image area becomes smaller. You can animate the crop area for simple garbage matting.

Note:

You can set up some keying parameters in the Pick Editor by picking. This greatly simplifies the task of setting up a key. See “Quick Key Setup – Pick Editor” on page 18 for more information.

XIII.7 Composite with Luminance and External Key

This effect permits to compose multiple foreground tracks. Depending on your disk configuration and on the parameter settings, the effect will still perform in real time with auto-keys of two foreground channels, or even more.

The effect CompEK creates a composite using either a luminance key or an external key, depending on the number of inputs given to the effect and the parameter ByLuma.

By default, the effect expects one background track and a single foreground track. The foreground can have a separate input to extract the alpha.

More inputs can be added just like with other multitrack effects like the 3D DVE. Use the Add Track command from the Time Editor menu. Each track as a complete separate set of keying parameters.

For each track, CompEK can

- extract keying information using alpha or luminance of the foreground image or an external key image

- create a composite correcting for pre-multiplied input images, extremely useful to prevent black borders when compositing using images generated with CG on black background
- project a drop shadow of defined color and opacity. The shadow can be made as a soft shadow or outline, although this will not give real time performance (the possible framerate with soft shadows is about half of real time)
- apply cropping for simple garbage matting and performance optimization
- position the foreground track on the background

Inputs:

The effect must have at least two inputs, and may have three. If tracks are added, for each track one or two inputs must be added, depending if luminance or external key mode is used.

Parameters

Parameters are separated in four groups: Key, Crop, Position, Shadow. The parameters are grouped in tracks - for each track added a new folder appears in the time editor.

- The Key subdirectory:
 - ByLuma: This parameter decides how keying is performed. The possible values are:
 - 0 – Use the alpha channel of the input as a key. This of course requires an RGBA input, what in most configurations precludes realtime operation.
 - 1 – Use the inputs luminance value to extract the key
 - 2 – Use an additional input's luminance as an external key
 Note that with mode 0 and 1, the track requires only a single input. If you use input 2, you must provide an additional input clip to extract the key. This is similar to the Displacement parameter of the 3D DVE – if displacement is activated for a track, an additional input must be provided to extract the displacement amplitude.
 - Gain, Clip: Work exactly as their counterparts on any traditional mixer, or the as the parameters of the same name in other Jaleo effects. The Gain parameter defines the minimum luminance level for the key – below this level everything is supposed to be transparent. Clip defines the width (in terms of luminance levels) of the transition zone from transparent to solid.

When using an external B&W image or an explicit alpha channel as a key, you normally would leave clip and gain on their default values (Clip = 0, Gain = 100).

To create a transition by luminance “flooding”, with the incoming image appearing at first at the darkest zones, gradually “invading” brighter areas of the outgoing shot, lower the clip value to about 3, and animate the Gain value from 0 to 100. Do not use a value of 0 for Clip; if the transition value is set up without any tolerance it can cause noisy results due to inherent noise in the video material.
 - Invert: Inverts the key obtained applying the previous parameters.

- **MixKey:** Allows to fade the foreground image in and out. 100 means full composition, 0 means only background is visible. Intermediate values continuously mix in the images, making the foreground objects to “appear”.
- **C-Black:** Corrects for pre-multiplied imagery, as they typically appear as the results of CG rendering. When compositing these images, you often get black borders around the composited objects, due to the “blending” of the object edges with the background color (typically black) during antialiasing when rendering. C-Black suppresses this effect.
- **The Crop subdirectory:**
 - **Left, Right, Up, Down:** Allows to crop the area of the composition. Anything outside the crop rectangle is discarded (i.e. only the background is visible). You can set up the crop by dragging a rectangle using the pick editor.
 - Note that by using the crop parameters, computation demands for the composition can be significantly reduced. Therefore, if only a small area of the foreground image is to be composited, it pays off to use the crop parameters. Reduced computation demands means that you are more likely to be able to stack yet another real time effect on top or below the composite without losing real time. For example, if you create a Composite with Chroma, you will typically be able to add another composite with external key (static images) on top of it, if the cropped area is not bigger than roughly 30% of the video area, still delivering full real time performance.
- **The Position subdirectory**
 - **OffsetX, OffsetY:** Allows to offset the position of the foreground and its related (extracted or externally generated) key. This can for example be used to position a text, or any type of “cutout”.
The offset parameters work only on pixel boundaries (no sub-pixel positioning). They are intended for static positioning, not for animation. If you still want to use them for moving a foreground object, be careful to not create animations that are very slow – a slow animation can look jerky. Still, medium or fast rolls or crawls (e.g. 3 sec / screen left to right) can be achieved with this type of animation.
For full sub-pixel animation, use the DVE effects of Jaleo.
- **The Shadow subdirectory** contains parameters related with shadow setup, as one would expect.
 - **ShiftX, ShiftY:** Offset of the shadow, in percent of size of image.
 - **Intens:** Intensity of the shadow. 0 means no shadow, 50 means semi transparent shadow, 100 means a solid shadow.
 - **Blur:** Defines the softness of the shadow. If set to a value different than 0, realtime playback can not be achieved with current hardware.

- **PushOut:** Only works if Blur is not set to zero. Pushes a soft shadow out toward its outer limit of softness, effectively growing its size, turning the softness into an outline. To get the outline effect, set Blur to 0.5 for example, and PushOut to 100. The grown shadow can still be offset by the Shift parameters. Setting them to zero provides a real outline effect, but offset outlines makes sense as well in some situations.
- **Red, Green, Blue:** Defines the color of the shadow. Unlike the previous Comp&shadow effects of Jaleo, where the shadow color was always black, here shadow color can be freely defined. Note: You can use the time editor's color box to set the color.

Note:

You can set up some keying parameters in the Pick Editor by picking. This greatly simplifies the task of setting up a key. See “Quick Key Setup – Pick Editor” on page 18 for more information.

XIII.8 DVE - RT

The DVE - RT in this software largely corresponds to the default, non-realtime 3D-DVE in the DVE menu. It has a largely equivalent parameter set. However, real time can only be achieved with a background and a single foreground layer. That is, the real time DVE is a single track DVE.

In general, use this effect only if you can predict that you will not need more advanced features, like e.g. motion blur. Otherwise, please use the slightly slower, but more powerful 3D-DVE effect.

Inputs: A background layer and a foreground layer. Both layers must be YUV without alpha – if you wish to do a DVE with an RGB layer, or a multilayer DVE, please use the standard, hardware accelerated 3D-DVE from the DVE menu.

The parameter set for the DVE - RT is largely identical to the default 3D-DVE version. However, this DVE - RT does not have lighting and antialiasing parameters, and there is currently no displacement mapping.

Different from the standard DVE, this DVE - RT has some additional parameters:

- shadow parameter to create a drop shadow
- border parameter to add a border

Also, the subdivision parameter for deformations, in the standard DVE expressed as a single number specifying a subdivision factor, now is split up in two subdivision parameters, allowing independent (and thus finer) control over subdivision in x and y direction. This is due to the fact that the realtime DVE is very sensitive to the number of polygons used for drawing the surface. A number too great of polygons will make the DVE lose real time performance.

Inputs:

The effect has two inputs, a background layer and a foreground layer.

If only one input is used, this input will act as a foreground, using black as the background (an effect like this can for example be useful for a so-called ‘fish-eye’ deformation, with no visible background).

New or Changed Parameters

3D placement parameters can be set with the 3D-View from the time editor menu.

- Shadow:
 - ShiftX, ShiftY: Shadow offset
 - Intens: Shadow Opacity. 100 is a solid shadow, 0 is fully transparent (invisible)
 - Red, Green, Blue: Shadow color. The color can be set with the color chooser tool from the time editor.
- The Crop directory:
 - Left, Right, Up, Down: Allows to crop the area of the composition. Anything outside the crop rectangle is discarded (i.e. only the background is visible).

- The Border directory:

The border drawn will not be deformed. That is, if you deform the image track to, say, a cylinder, the border will stay flat.

- Red, Green, Blue: Border color. The color can be set with the color chooser tool from the time editor.
- Width: Border Width
- Soft: Border softness.
- The Deform directory:
 - SubDivX, SubDivY: Subdivision of image in x and y direction. This is counted in steps in each direction. The defaults, 8 and 6, cause the image to be subdivided in 6 times 8, that is, 48, squares, which makes a total of 96 polygons, as each square handled as two triangles. The maximum is roughly half a million polygons. If you are not deforming the image, you should not raise these values, and even then only if necessary.
 - Deformation parameters are identical to the normal DVE 3D
 - Wave directory: Allows you to set up a wave displacement of the image.

XIII.9 Solid Color

This color generator can be found in the Fx -> Utilities submenu. It is an effect with no entries, generating a solid color image (or color field) in RGB image format. However, inputting an RGB formatted image into a RT effect would force a color space conversion to YUV, effectively losing real time operation. For this reason, the Solid Color utility features a boolean parameter In_YUV: this switch will force output of the Solid Color generator to YUV format, preserving real time operation when used in conjunction with other RT effects.