Satori Circulation 0.763 Beta
Circulation User's Manual

Circulation 0.763 Beta Limited

This software is under constant development, therefore it is the aim of the developers, Satori, to steadily update Circulation. These updates of Circulation will be formulated also according to the feedback coming from the users.

It would be advisable to address your comments and suggestions, to circulation@satori.sk.
Also, do not forget to visit http://download.circulation.sk in order to obtain the latest demo version.

For latest news visit http://circulation.sk to get involved in what is happening recently around this application.

1. Introduction

Circulation represents a live video mixing engine and a postpruduction facility. It is fully optimized for live performance VJ-ing. Circulation is running on MS Windows operating computers using a complex but also very minimalistic graphical user interface. Three independent inputs can be, separately, enhanced fully by various effects. The synergistic output can then be further adjusted by the same set of effects. The effects are live-configurable and can be separately connected to adjustable generators. Through the pipeline feature each post-effect set can be adjusted live in terms of effect sequence – separately for the individual sources and then also for the final output.

1.1 Limitation of this free Beta version

The video output is optimized to the resolution of 640x480 pixel at a frame rate limited only by the computing power of the equipment used. Output can also be saved and then used as source. The resolution of the saving option in the LIMITED version is set at 320x240 pixel with a fix frame rate of 25 fps and further restrictions.
The possibility to create output screen-shots is also disabled in the LIMITED version.
The possibility of second output on dual-head graphic cards with final mix output is disabled in this free version.

2. Installation

Warning: for GUI 1024x768x32bit mode is needed. For output screen 640x480x32bit. Currently no other than 32-bit modes are supported.
Please read the 'notice.txt' before running the software. The configuration of the software is controlled by the **circulation.ini** file.
All supplied plugins are enabled and configured by provided configuration example.
Refer to **configs.rtf** documentation and **list.txt** files in order to configure further medias to your set.
It's recommended to work with alternative file explorer in order to have a better view over the whole directory structure and installed set. Try out FAR (http://farmanager.com) or alternatively Total Commander (http://www.totalcmd.net)

3. Architecture

The picture below on the next page shows the the logic behind the image processing used by the Circulation software. The details about source possibilities, effects available and mixing techniques follow.
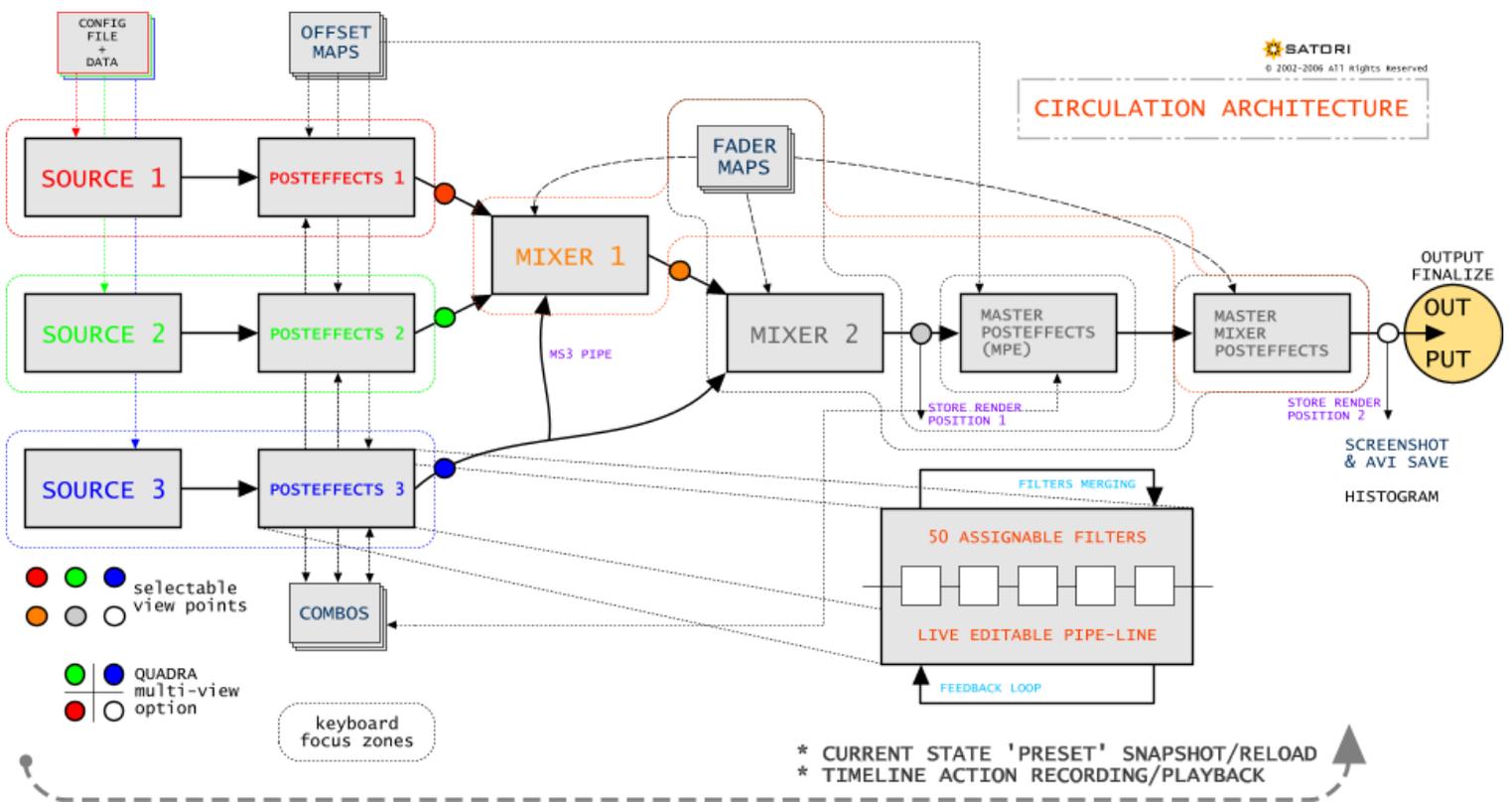
4. Sources

The sources have several options represented by live camera capture, videos in compressed .avi format, pictures and also special plugins, e.g. shifter for better control of the outgoing output feedback possibilities.

4.1 Aviplay

This plugin plays videos in .avi format. Videos have to be configured first before running the software and then can be switched without delay during the performance for each source individually. The configuration insist of copying the files in the directory **/dat/aviplay** and editing the **list.txt** file to hold their names. Videos can be loaded in 100 video banks which have to be set in the list file, each bank can hold 26 videos.

We have to strongly recommend the usage of Motion-JPEG codec for video encoding. Also supplied examples are encoded in this codec which is very suitable for reverse replay and random cut. If the videos that are stored with this codec are of slightly bigger file sizes, you benefit from very fast decompression and stable replay.

Please download the codec and install it (if you don't already have a previously-installed related codec from some codec pack or a commercial mjpeg codec in your system) - download possible from:
http://www.pegasusimaging.com/pvmjpegdownload.htm.
Other alternative is usage of free Koepi's Video for Windows XviD codec - recommended download:
http://www.koepi.org/xvid.shtml.
This codec allows replay of DivX/XviD videos easily. Usage of I-frames as frequent as is recommended for fine random cuts or bi-directional encoding for smooth backward replay. However Motion-JPEG stands for codec with best performance replay.

4.2 Picblur

Pictures can be loaded in all resolutions from the **/dat/pictures** folder and then when the resolution is higher than 640x480 pixel they are shown in their native dimensions. Use mouse to pan through the higher resolution images.

4.3 Slider

Slider is another picture-loader, however it is meant for displaying pictures as a slideshow. Pictures in the **/dat/slider** must be in exact resolution 640x480 pixel, RGB or gray scale.
The slide show configuration is set in the **/dat/slider/list.txt** file together with all defined picture folders.
Each folder holds one sequence of images with another **list.txt** which lists the order of images.

4.5 Capture

Live camera input has to be in raw format at user-selected resolution in 16, 24 or 32 bits RGB color mode or YUY2 or I420. USB webcams and other cameras can be used in this plugin. Simultaneous usage of more cameras will be provided in further BETA versions. This source provides also buffering of captured images for scratching effects of live footage.

4.6 Typer

This source option enables showing of text messages during the performance. The text can be processed using all available effects as other sources and live font-switching will be provided in further versions.

4.7 Shifter

Plugin shifter can be used sensibly only as the first source for feedback control. It enables mouse control over the position of compound output of the remaining sources. It can be also post-effected what creates a really wide range of feedback possibilities.

4.8 Render

Render is intended for using the output of the whole mixing system as an input for further processing and represents another feedback option, like shifter. Delay of the output can be selected and then the full range of effects can be used to process it.

4.9 Noise

Noise allows using pictures loaded in **/dat/noise** directory for noise patterns. The noise pictures can be added but have to configured in the related **list.txt** file first.

4.10 Swfplay

Using Swfplay as source allows you to display animations and interactive pieces created using Adobe Flash (.SWF). This source is using active-x replayer installed on your system for Internet Explorer. Please be sure to have the latest plugin for this browser installed. Browse to http://abobe.com for such action in IE and follow the site (Get Adobe Flashplayer button). The file **/dat/swfplay/list.txt** holds the list of mapped flash movies.

4.11 Black

This source is for using black full screen image as default and this blank screen can be set to different color.

Note: SDK for writing custom sources will be released in next versions.

5. Post-effects

This is a very brief overview of post-effects available for altering the related sources. Some of these effects allow more variations to be selected.

Generators can be patched in at various points in the interface to modify the slider values . All generators have the same parameters: random, sine, frequency and hold. These parameters are adjusted by four sliders marked **R S F** and **H**. The value of the parameters is numerically displayed with a range of 0 to 127. A thumbnail graphic displays an animated snapshot of the generator's output waveform.

The generator has two sources of signal, a random number generator and a sine wave. Their levels are set by the **R** and **S** sliders. The next slider, **F** sets the sine frequency. Hold takes amplitude snapshots of the waveform at an adjustable hold frequency.

This introduces discrete steps in the waveform. The hold time is set by the **H** slider.

Hint: Try syncing your chosen effect into music with this.

In the post-effects panel sheets titled **combo** and **pipeline** for each source and MPE (Master Post Effects) are located. In the combo box presets of defined post-effects settings can be stored - maximum 50 combos total. The pipeline panel serves as an overview of the activated post-effects, while the sequence of the effects can be simply changed by drag-and-dropping them into the scheme. The remaining panels **set1** and **set2** feature the following post-effects:

screenshot	- snaps input image and holds it as static image
raster	- various pixel swap variations
lens / twirl	- simple effects on mouse cursor position with selectable level
flip	- horizontal and vertical flip of the image
mirror	- mirrors half of the image (vertical or horizontal)
mirror smooth	- same as mirror but with smooth crossfade
zoom2x	- 200% zoom on mouse cursor or other position
zoom	- central zoom
mosaic	- smoothly selectable mosaic
mosaic 8 / 16	- 8 or 16 pixels mosaic with 3 different ways of pixelizing
vectorize	- turns the image onto vector facialised version
blur	- various levels of typical blur
gausian	- smooth gausian blur (currently unoptimized)
gray	- converts to black & white
emboss	- 3 ways of embossing with selectable level and angle
nega	- negative image
strobo	- stroboscopic negative flashing of image
threshold	- creates 2 color version of image according to selected level, select foreground and background color to be used
posterize	- cuts down the resolution of color space
dither	- dither image with 2 colors with 5 different ways of patterns
font	- various bitmap fonts used to filter image
modulo	- mathematical function modulo (remainder of division) is used to filters image in various ways, only version 1 implemented for now.
luma pixel	- mosaic the image according to the luma of each pixel
luma blur	- blur pixels according to the luma level of pixels
emboss blur	- blur pixel according to the emboss level
pixelate interpol	- use interpolation of rectangles to simulate video compression artifacts
offset	- displace image according to the selected map
tile	- weld the image borders to create endless image
position / shift	- change the position of image or apply position shifting
difference	- shows the difference between last 2 frames
hue	- rotate around the color space
saturation	- boosts colors or smoothly turns image to gray scale
levels	- separately adjust R,G,B levels
vertical 3d	- generates a vertical 3d image, according to luma of the pixel, more versions available
3d sphere	- transforms image with spherical terrain mapping
3d plane	- image as plane in 3d space with selectable angles, distance and position
stretch	- stretch or squeeze image (horizontal or vertical), can skew image as well
contour	- represent image as contours
histo-distort	- horizontal distortion of image according to the histogram
feedback in / out	- select feedback IN and OUT in pipe-line to produce feedback with selected fader
merge in / out	- select IN and OUT in pipe-line. IN snaps the current image and OUT combines snapped image with current state with selected fader
merge swap	- swaps current image with image stored in merge IN buffer
gapper	- the output stream is frozen for a selected number of frames, all resulting frames are merged and output for the next "gap"
anaglyph	- pseudo-3d image is created for anaglyph glasses
gamma	- adjusts the image curve
kaleidoscope	- the old classics
copper	- copies vertical / horizontal line of image on selected level with shade possibility
fader snap	- gray scale version of image created as cross-fade bitmap

6. Mixing

For faders which features "hard" ways of mixing two sources an outline color can be selected and outline turned on. The following faders can be adjusted by outline: map, movebox, lumacut, lumacut inverse, stripe, fat stripe, 1hstripe, 1vstripe, hstripes, vstripes.
Faders usings bitmap for fading: map, map alfa and map alfarot.
This bitmap can be turned to rotation mode by selected step value including the direction.
A special way of bitmap is in mixer1 a possibility to select a third source as fader bitmap. Keyboard shortcut for the each faders is placed after the description.

Also generators can be used to control the values of cross-faders - see the description in previous chapter.

This faders can be accessed via GUI:
```
cross               - typical cross-fade  (1)
luma key            - first the more light parts of image are mixed (8)
luma shade          - shades the image according to luma (9)
colorize            - upper source color colorizes the mix (L)
add                 - adds second source by luma overlap (I)
add satur           - adds second source by white saturation (O)
difference          - subtracts the images (P)
offset              - displaces one source with another (F)
map                 - uses the selected bitmap, outline can be used, rotation of the bitmap as
                      well (7)
map alfa            - uses the bitmap with alfa (E)
map alfarot         - the same as map alfa but alfa is rotated (R)
movebox             - keys second source in size selectable rectangle (T)
lumacut             - after certain luma level source is mixed (G)
lumacut inverse     - after certain luma (but inverse way) level source is mixed (H)
strobo              - directly shows first or second source of the mix (2)
flash               - each frame another source is flipped to output (S)
```

These can be selected by keyboard shortcut only.
```
stripe              - vertical stripes used as fader (3)
far stripe          - fat stripes used as fader (4)
shift 1             - vertical image shift as fader (5)
shift 2             - different version of vertical fader (6)
1hstripe            - 1 random horizontal stripe (Q)
1vstripe            - 1 random vertical stripe (W)
hstripes            - random horizontal stripes (Y)
vstripes            - random vertical stripes (U)
```

7. Keyboard Shortcuts

7.1 Keyboard focus

Most shortcuts are bound to one source, therefore to use the shortcuts the keyboard focus has to be set for the appropriate source. The focus is set using arrow keys and is derived from the position of the sources outputs in the quadra view option. Focus on the first source is activated by the down arrow, second source by the up arrow and third source by the right arrow.

```
DOWN                - keyboard focus on source 1 / post-effects 1
UP                  - keyboard focus on source 2 / post-effects 2
RIGHT               - keyboard focus on source 3 / post-effects 3


LEFT                - keyboard focus on mixer 1
RightCTRL+LEFT      - keyboard focus on mixer 2
RightCTRL+RIGHT     - keyboard focus on master post-effects (MPE)
```

7.2 General control

```
LeftCTRL+DOWN       - plugin initialization in the source 1
LeftCTRL+UP         - plugin initialization in the source 2
LeftCTRL+RIGHT      - plugin initialization in the source 3


RightCTRL+DOWN      - copy of source 2 into source 1 including posteffects settings
RightCTRL+UP        - copy of source 1 into source 2 including posteffects settings


PRNTSCRN            - saving of output screenshot (only in full BETA)
LeftCTRL+PRNTSCRN   - start of output saving in AVI (restricted in the LIMITED version)
END                 - termination of video saving
ESC                 - termination of software (confirmation may be needed Y/N if not defined INI-
                      tag fastquit)
```

```
CapsLock ON       - if CapsLock is turned ON all keyboard events are disabled from processing
                    until CapsLock is switched to OFF. In this mode you can access defined
                    keyboard triggers.

F1..F10           (or)
CTRL+[F1..F10]    - predefined plugin selection from the source on which the keyboard
                    is focused (if keyboard is not focused on source 1, 2 or 3 no selection
                    will be performed)
```

7.3 GUI control

7.3.1 Panel selecting

```
ALT+
F1..F3            - selection of GUI panel for SOURCE1..3
F4..F6            - selection of panel for POSTEFFECTS1..3
F7                - selection of panel for MPE (master post-effects)
F8..F11           - selection of panel for SET1, SET2, PIPE-LINE, COMBO (post-effects'
                    subpanels)
```

7.3.2 Selecting GUI view-port monitor

```
SHIFT+
F1                - selection of final output screen monitor
F2                - selection of quadra mode (source1 | source2 | source3 | output)
F3..F4            - selection of mix1 and mix2 screen
F5..F7            - selection of source 1, source2 and source3 output (including appropriate
                    post-effects)
F12               - toggles (on/off) the selected output(s) to fullscreen mode without any GUI
                    controls
```

7.4 Mixers

Mixer1 (keyboard focus: LEFT)
```
[1..9|Q..P|A..L]  - crossfade selection between source 1 and source 2
SHIFT+[1..9|A..Z] - crossfade image selection for mixer 1
0                 - sequence last 8 selected faders
```

Mixer2 (keyboard focus: RightCTRL-LEFT)
```
[1..9|Q..P|A..L]  - crossfade selection between mix 1 and source 3
SHIFT+[1..9|A..Z] - crossfade image selection for mixer 2
0                 - sequence last 8 selected faders
```

Mixer1+2 (works in both LEFT and RightCTRL-LEFT keyboard focus)
```
Z..N              - selection of effect for master blur
M                 - autosequence of last 8 selected blurs
ALT+[1..9|A..Z]   - map selection for time-distort effect
```

7.5 Master posteffects + misc.

```
RightCTRL+
T                 - switching of time distort effect (on/off)
Y                 - switching of fast time distort effect - without aliasing (on/off)
U                 - switching of time distort effect by usage of first time buffer field as map
I                 - info view - you can view log and timeline script this way too plus other
                    info (for non-GUI operation)
                  + in this mode if you press ENTER so you can type timeline command!
C                 - switching of clear value by key-level effect (on/off)
G                 - switching of black&white output (on/off)
F                 - GUI refresh (if accidently erased by system etc.)
B                 - switching of monoscope to output (on/off)
R                 - initialization <RST> of master effects and mixers
```

```
S                   - state snap! Circulation preset is saved in defined 'state' folder
Q                   - load preset by browsing down files *.crs in defined folder via
                      'browse_states_dir' tag in INI
W                   - load preset by browsing upfiles *.crs in defined folder via
                      'browse_states_dir' tag in INI
P                   - switching of displaying mouse (on/off) (for non-GUI operation)
Z                   - switching of output mask (on/off) //TO-DO
4                   - toggle (on/off) fullscren of viewing area
```

7.6 Posteffects

```
RightCTRL+
I                   - init (reset) posteffects
B                   - blur (on/off)
6,7,8               - blur levels
T                   - threshold (on/off)
D                   - dither (on/off)
1,2,4,5             - dither types
A                   - posterize (on/off)
S                   - screenshot (on/off)
Q                   - reset pos X
W                   - reset pos Y
E                   - reset shift X
R                   - reset shit Y
0                   - lens (on/off)
J                   - twirl (on/off)
K                   - mirror hor smooth (on/off)
L                   - mirror ver smooth (on/off)
V                   - vertical flip (on/off)
H                   - horizontal flip (on/off)
N                   - mirror hor (on/off)
M                   - mirror ver (on/off)
C                   - vectorize (on/off)
9                   - font (on/off)
X                   - zoom2x (on/off)
Z                   - zoom (on/off)
F                   - feedback (on/off) [to-do]
U                   - [to-do]
O                   - [to-do]
P                   - mosaic (on-off)
```
[to-do] be continued...

7.7 sources

7.7.1 Aviplay

```
0..9                    - video bank selection 0..9
LeftCTRL+0..9           - video bank selection 10..19
LeftALT+0..9            - video bank selection 20..29
LeftCTRL+LeftALT+0..9   - video bank selection 30..39
LeftSHIFT+0..9          - video bank selection 40..49
+                       - selection of next video bank (+1)
-                       - selection of previous video bank (-1)


letters A..Z        - clip selection from the active video bank


SPACE               - change of playback direction


LeftCTRL+
W, Q                - rewind or fast forward
R                   - random video skip
T                   - random oscillation effect around actual played video frame
L                   - switching of video play in loop
P                   - switching of ping-pong loop
```

```
X                       - video playback according to mouse position
G                       - starts group video playing
S                       - saves the video on drive using the defined effects
D                       - direct stream
I                       - sets IN loops according to actual video frame
O                       - sets OUT loops according to actual video frame
Y                       - sets IN at first video frame
U                       - sets OUT at last video frame
```

7.7.2 source Picblur

```
0..9                    - picture banks selection
LeftCTRL+A..Z           - picture selection in the actual picture bank
Q, W                    - listing inside the actual picture bank
A, S                    - random picture view jumping (higher resolution then 640x480 pixel)
D, F                    - picture view circling by selected radius
                           (higher resolution then 640x480 pixel)
G, H                    - image drift by one axis - best used when both sources have picblur selected
T                       - resets all picture movement parameters
Y                       - sets the position in the center of the picture
                           (higher resolution then 640x480 pixel)
E                       - enables picture 'fire effect'
R                       - enables stroboscope effect
Z, X                    - motion blur level selection
                           (moving inside of picture with higher resolution than 640x480 pixel)
C                       - 'blur flash' - blur buffer stroboscope effect
V                       - enables effect of random color cutting (on/off)
B                       - selection between three types of color cutting
N, M                    - +/- selection of the position for color cutting from 7 levels
J,K,L                   - erases color elements R,G,B
```

7.7.3 source Shifter

```
Q, W                    - horizontal shift
A, Z                    - vertical shift
E, R                    - fine horizontal shift
D, C                    - fine vertical shift
O                       - initialization of horizontal shift to 0
P                       - initialization of vertical shift to 0
L                       - switching of image alignment (on/off)
SPACE                   - holds image when only source shifter is active
                           (no transition with other source) (on/off)
I                       - erasure of actual picture
3..9                    - selection of picture erasure by 3..9 frames
0                       - termination of picture erasure by frames


LeftCTRL+
Z                       - image spill effect (on/off)
K                       - holding of image spill (on/off)
X                       - horizontally image stretching(on/off)
C                       - switching of image 'fire effect' (on/off)
1..9                    - image saturation to white by level 1..9
0                       - termination of image saturation
```

7.7.4 source Render

```
1..8                    - movement in the buffer by 1..8 frames
O                       - saves the output after application of mixer 2 settings
M                       - saves the output after application of master post-effects
```

7.7.5 source Capture

```
1                       - normal display of captured image (works if capture mode is 320x240)
2                       - smooth display of image (works if capture mode is 320x240)
```

```
3                        - raster image in 2x2 matrix (works if capture mode is 320x240)
4                        - raster image in 4x4 matrix (works if capture mode is 320x240)
R                        - displays random frame from capture buffer
B                        - plays backwards capture buffer
F                        - plays forward through capture buffer
C                        - closes capture buffer from live input (on/off)


LeftCTRL+
1..9                     - selects delay between recorded and output frames of capture buffer
                            (1 - smallest, 9 - longest)
0                        - no delay between recorded and output frame
```

7.7.6 source Black

```
Q..T                     - level of R
A..G                     - level of G
Z..B                     - level of B
```

7.7.7 source Slider

```
1..9+A..Z                - enables selected slide show for output


LeftCTRL+
C                        - uses classic cross-fade to change from image to another in slide show
S                        - uses add satur to change from image to image
L                        - uses luma key
```

7.7.8 source Noise

```
1..0                     - selects desired image for output
A..Z                     - various effects to distort image
                            (detailed description in later versions of this doc)
```

8. Usage of GUI

The user interface is interactive on the actual mouse position and can be fully controlled by mouse operations.
For best performance combination of mouse, midi and keyboard shortcuts is recommended.
The effects are activated by clicking on the related [**on**] button and value of related parameters in bar
controllers or virtual knobs can be directly set by clicking on the desired position on them. Mouse wheel can be
used to change numbered values but also sliders and knobs in GUI.
Direct input of new value will be added in later versions. The wheel is used to change bitmaps (fader map,
offset map in post-effects) as well. Combination of CTRL+wheel can be used to change value in larger steps.
On control bars ALT+wheel is used for more fine changes.

8.1 Multi-mouse control

There are 6 keyboard focuses. You can work with 6 independent mouse pointers as well. You have 6 main view
selectors of rendering pipeline on the following points: source1, 2, 3; mix 1, 2; output/master (please refer to
Architecture chart if you are not sure about this). In selected view you control independent mouse pointer. If
you enter area of the render view your mouse-pointer become visible in the appropriate color according to the
color of view selector tab:
(**SOURCE1**=**RED**, **SOURCE2**=**GREEN**, **SOURCE3**=**BLUE**, **MIX1**=**ORANGE**, **MIX2**=**GRAY**, **OUTPUT**=**WHITE**).
If you want just to move a movie pointer you press right mouse button and selected a desired position. If you
want to send a left mouse click to view press left button (in this state you can control mouse pointer as well and
no need to press right button). A special feature is QUADRA view where you can scope source1, 2, 3 and final
output. Here you can cotrol all 6 pointers in one view. Source1, 2, 3 pointers are simple modified in their area
as described above just in half-sized resolution. In output area you have 3 mouse pointers visible for mix1, 2
and output/master. Normally you control output/master mouse pointer but if you hold meanwhile **RightALT**
you control mix1 pointer and if you hold **RightCTRL** you control mix2 pointer.

See image below on next page for example of QUADRA view and composition using multiple mouses.

SRC2 'slider'
(twirl effect)

'render' SRC3
(twirl effect)

'generative' SRC1
(zoom2x effect)

MIX1
(box fader)

OUTPUT/MASTER
(lens effect)

MIX2
(box fader)

CIRCULATION © SATORI 2002-2007

multi-mouse example   OUTPUT QUADRA   MIX 1   MIX 2   SOURCE 1   SOURCE 2   SOURCE 3