



**SILHOUETTE PAINT**  
**User Guide**

## ABOUT THIS GUIDE

This User Guide is a reference for Silhouette and is available as an Acrobat PDF file. You can read from start to finish or jump around as you please.

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### About Us

Founded in 1995, Boris FX is a leading developer of VFX, compositing, titling, video editing, and workflow tools for broadcast, post-production, and film professionals. Boris FX products have grown to serve over a million artists worldwide. The company's success lies in its ability to tightly integrate and leverage technologies through strong partnerships with Adobe, Apple, Avid, Blackmagic Design, Autodesk, FilmLight, Grass Valley, Magix, SGO, and other leading developers of video editing software. In 2014, Boris FX acquired Imagineer Systems, the Academy Award-winning developer of Mocha planar tracking software. In 2016, Boris FX acquired GenArts, the developer of Sapphire, the gold standard plug-in package for high-end visual effects. In 2019, Boris FX acquired the Academy Award-winning Silhouette for advanced feature film rotoscoping, painting, and effects.



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## SILHOUETTE FEATURES

Silhouette is a high dynamic range, non-destructive, 2D raster based paint system that was designed from the ground up to handle the demands of feature film and television production. Now, the same Academy Award And Emmy Award winning paint tools used by visual effects artists worldwide can be used for paint and retouching in Adobe After Effects & Premiere Pro, Foundry Nuke, Blackmagic Resolve & Fusion, and Magix Vegas host applications.

Black & White, Blemish, Blur, Burn, Clone, Color, Color Correct, Cutout, Detail, Dodge, Drag, Eraser, Grain, Mosaic, Repair and Scatter brushes are available for any task. As you paint, every action you make is recorded as events. These events can be selectively played back on the same frame, different frames, multiple frames and with or without tracking data applied. This makes for a very powerful and versatile Auto Paint feature that provides the flexibility of vector paint with the speed of a raster paint system.



## Paint

- **Black & White, Blemish, Blur, Burn, Clone, Color, Color Correct, Cutout, Detail, Dodge, Drag, Eraser, Grain, Mosaic, Repair and Scatter brushes**
- **Non-destructive raster paint system allows playback of paint strokes on a range of frames or the entire clip**
- **Detail separation separates the image into color and detail layers**
- **Automatic recording of paint events with selective stroke playback**
- **Track paint strokes and Clone sources**
- **Sophisticated cloning interface**
- **Motion track, position, scale, rotate, skew and corner pin clone sources**
- **Color Correct, Blur, Sharpen or Warp the Clone source**
- **Onion-Skin and Align tools to match up elements**
- **Presets to store brushes and their settings**
- **Automatically redo all paint strokes if a source sequence changes**
- **Roto shape assisted painting**
- **High dynamic range painting in 32 bit float**

## Tracker

- **Planar Tracking using either Mocha Pro or Silhouette's Planar Tracker**
- **Planar Trackers provide automatic, markerless motion analysis and tracking**
- **Planar Tracker tracks corners, edges or ridges**
- **Track multiple planes simultaneously**
- **Unlimited Point Trackers for manual precision**
- **Match Moving or stabilization**
- **Pre-processing filters for problematic shots include: Blur, Sharpen, Contrast, Gamma, De-Noise and Remove Flicker will increase tracker accuracy for problematic images**
- **Post-processing of point tracking data to include: Average, Smooth and Merge**

# Roto

- Shape assisted paint
- Unlimited number of animated B-spline, X-Spline, Bézier or Freehand shapes
- Integrated Motion Tracker that can apply motion data to points or shapes
- IK (Inverse Kinematics) for animating humans, animals and all manner of jointed creatures
- Support for open or closed shapes
- Move, scale, rotate, shear, and corner-pin shapes and groups of shapes
- Create magnetic freehand shapes with or without magnetic properties
- Edge Snapping tool that snaps the control points of an X-Spline to an object edge
- Point-by-Point variable edge softness
- Animation changes for one point or selected points across all keyframes
- Realistic motion blur
- Independent shape viewing and hiding
- User-definable names, colors, blurs and blend modes for each shape
- Display shape animation over image as an outline or filled color
- Shape import

# Architecture

- Region of Interest for enhanced performance
- Scripting and Actions
- OpenColorIO Color Management
- Multi-processor support
- GPU and OpenGL® accelerated

# Supported Hosts

- Adobe After Effects and Premiere Pro
- OFX support in The Foundry's NUKE, Blackmagic Resolve, Autodesk Flame and more

# INSTALLATION

## Windows / Macintosh

- 1 Download Silhouette from: [www.borisfx.com](http://www.borisfx.com)
- 2 Double-click on the file that was downloaded and when prompted, select the destination programs to install to. You can choose from Adobe After Effects/Premiere Pro and OFX.

Silhouette will now appear as an available plug-in within the host application.

- 3 Start the host application and apply Silhouette:
  - After Effects: Apply Silhouette Paint to a clip in the timeline from the Effects > Boris FX Silhouette menu.
  - Premiere Pro: Apply Silhouette Paint to a clip in the timeline from the Effects > Video Effects > Boris FX Silhouette group.
  - OFX: The method for applying an OFX plug-in varies. Consult the OFX host software documentation for details.

## Linux

- 1 Download the Silhouette software at [www.borisfx.com](http://www.borisfx.com)
- 2 Open a Terminal window and change to the directory where you downloaded the file.
- 3 Type: `tar xvzf <name of file>`
- 4 Change to the new directory that is created.
- 5 To install Silhouette Paint for OFX, run the “install\_paint.ph” script by typing:  
`sudo ./install_paint.sh`

Silhouette is unpacked into the OFX plug-ins directory and will now appear as an available plug-in within the OFX host application.

- 6 Start the host application and apply Silhouette. The method for applying an OFX plug-in varies. Consult the OFX host software documentation for details.

## Linux Modifier Key Configuration

When using the KDE or GNOME desktops, by default there is a Move Window modifier key combination set up, so that if you **Alt**-drag a window, it will move. This interferes with our **Alt**-drag capability in some tools, so you will want to disable this desktop feature.

### KDE Desktop

- 1 Run the KDE Control Center.
- 2 Go to the Desktop/Window Behavior panel and select the “Actions” tab.
- 3 Down in the Inner Window, Titlebar & Frame area, change the “Modifier Key” option from Alt to Meta.

### GNOME Desktop

- 1 Run the Control Center in Preferences.
- 2 Select Windows.
- 3 Select Super (or “windows logo”).

## Linux Tablet Configuration

We require that proper tablet support is enabled in the X server. This part is left up to the user, as it is very distribution and version specific. This site can be used for more information: <http://linuxwacom.sourceforge.net/index.php/all>



# LICENSING

## Node-Locked Licenses

When you purchase your license, you will be emailed a serial number.

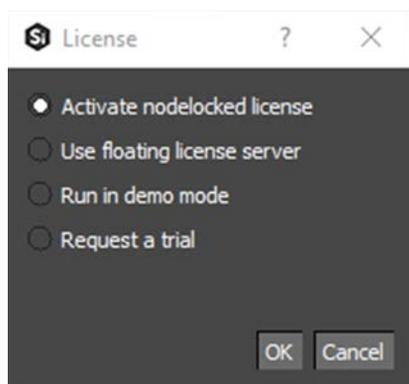
### Internet Activation

When your machine is connected to the Internet, you can activate directly in a few simple steps.

- 1 Make sure you are connected to the Internet.**
- 2 Apply Silhouette:**
  - **After Effects: Apply Silhouette Paint to a clip in the timeline from the Effects > Boris FX Silhouette menu.**
  - **Premiere Pro: Apply Silhouette Paint to a clip in the timeline from the Effects > Video Effects > Boris FX Silhouette group.**
  - **OFX: The method for applying an OFX plug-in varies. Consult the OFX software documentation for details.**
- 3 Open the Silhouette user interface.**
  - **After Effects/Premiere Pro: Click the Silhouette Interface > Open button.**
  - **OFX: Click the Open Silhouette Interface button.**

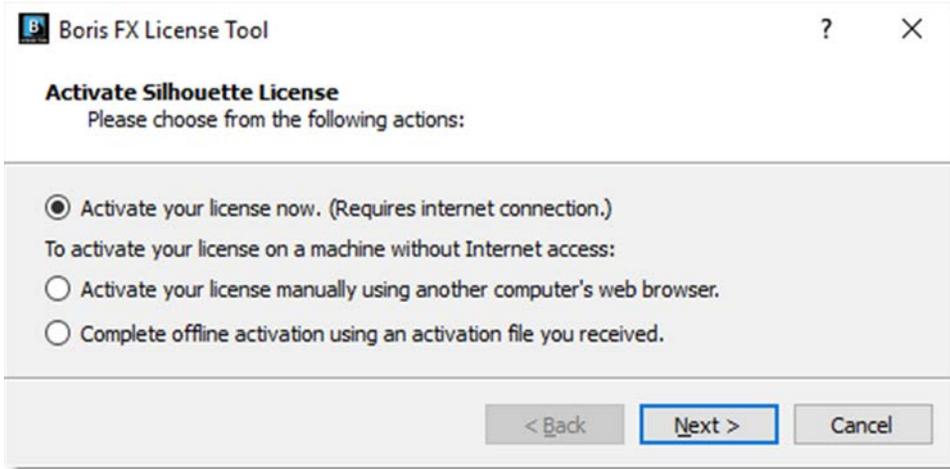
The Silhouette user interface opens.

- 4 Select Activate nodelock license in the License window and click OK.**

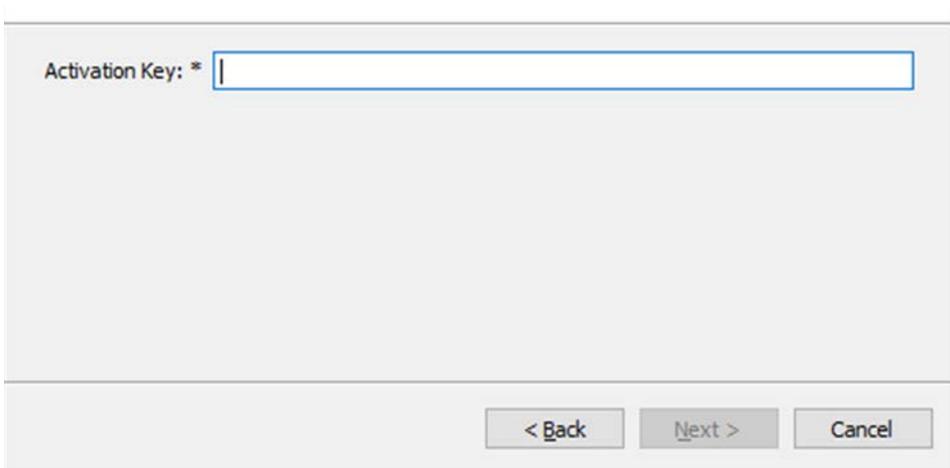


The Boris FX License Tool will load.

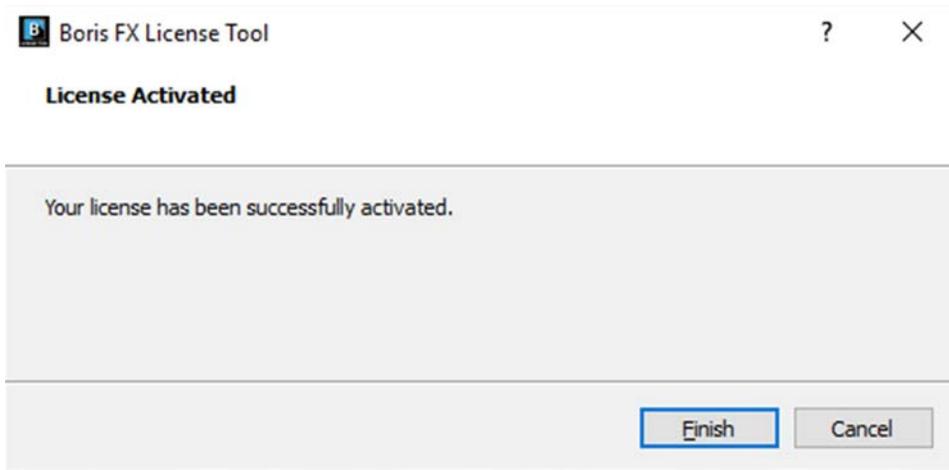
**5 Choose Activate your license now and press Next.**



**6 Paste the serial number into the Activation Key field and click Next.**



If the activation is successful, details will appear on the next page.



**7 Select Finish.**

Your license is now installed and Silhouette opens.

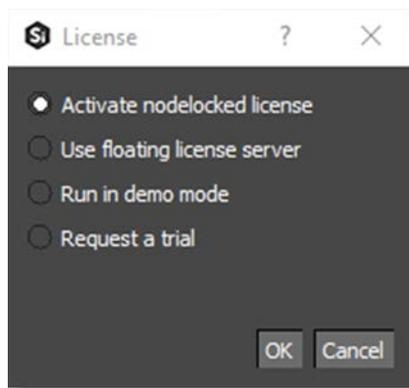
## Offline Activation

If your machine is not connected to the Internet or you are behind a firewall, use the Activate your license manually option.

- 1 **Apply Silhouette.**
- 2 **Open the Silhouette user interface.**
  - **After Effects/Premiere Pro:** Click the Silhouette Interface > Open button.
  - **OFX:** Click the Open Silhouette Interface button.

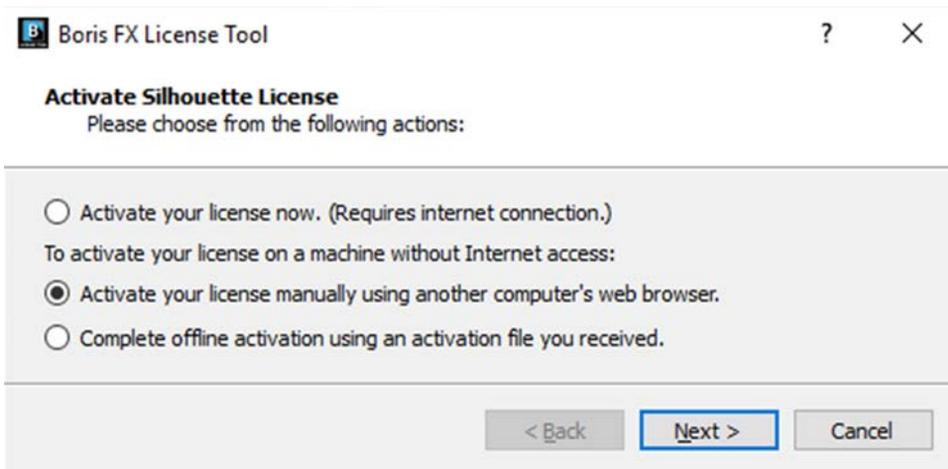
The Silhouette user interface opens.

- 3 **Select Activate nodelock license from the License window and click OK.**

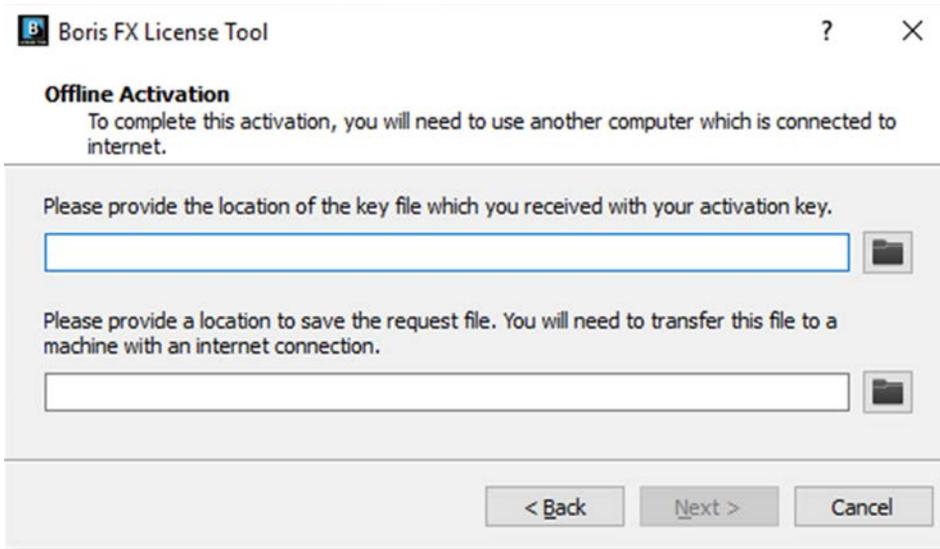


The Boris FX License Tool will load.

- 4 **Choose Activate your license manually using another computer's web browser and press Next.**



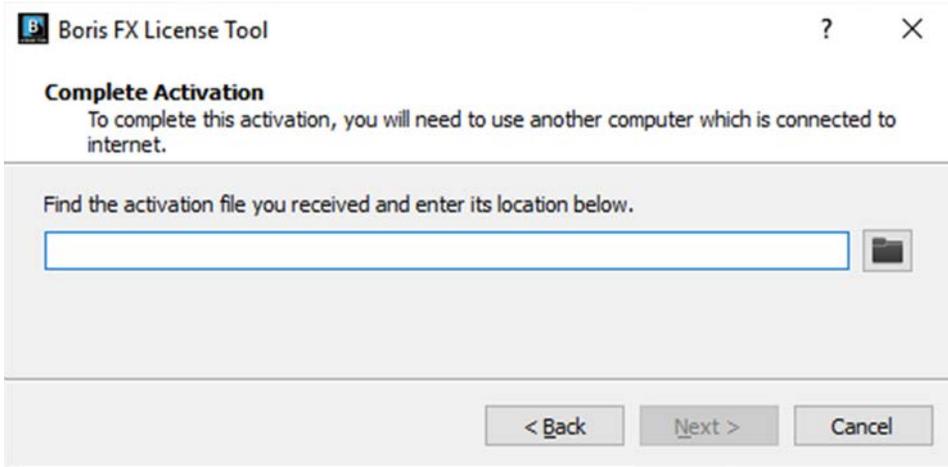
**5** You will be provided with file fields to load a key file.



The screenshot shows a dialog box titled "Boris FX License Tool" with a question mark and a close button. The main heading is "Offline Activation". Below it, a message states: "To complete this activation, you will need to use another computer which is connected to internet." The dialog contains two text input fields, each with a folder selection icon to its right. The first field is preceded by the text: "Please provide the location of the key file which you received with your activation key." The second field is preceded by the text: "Please provide a location to save the request file. You will need to transfer this file to a machine with an internet connection." At the bottom of the dialog are three buttons: "< Back", "Next >", and "Cancel".

- 6** Download and save the key file that you received from your license email from a computer that has an Internet connection.
- 7** Transfer the key file to your offline machine you are going to activate via a flash/thumb drive or a shared network.
- 8** Select the location of the key file in the first field.
- 9** Pick a location for the request file (which will be created) in the second field.
- 10** Copy the request file (.req) to a machine with an Internet connection.
- 11** Upload it to <http://activation.borisfx.com/offline-activation.php>.
- 12** Save the activation file it returns (via download or email), and copy that back to the offline machine.

**13 Enter its location into to the license tool and click Next.**



Your license is now installed and Silhouette's New Project dialog box opens.

## Internet Deactivation

Once Silhouette has been activated, you can access the deactivate option by selecting the Help > License menu.

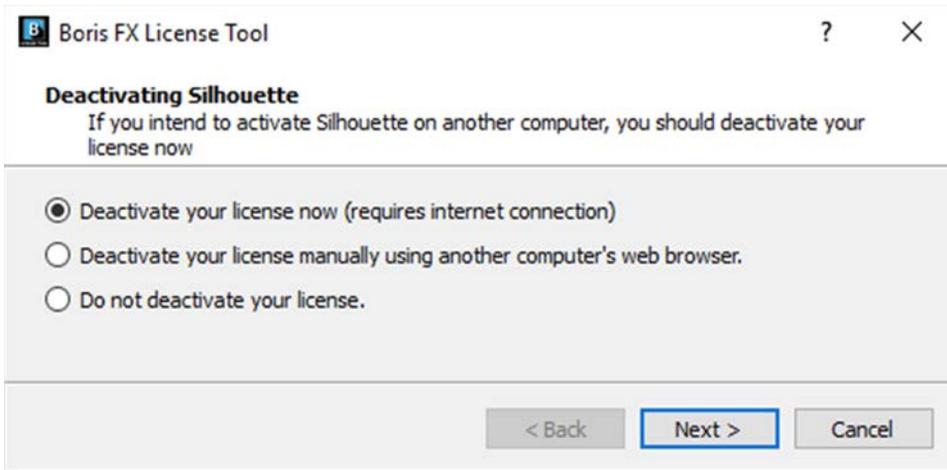
- 1 Make sure you are connected to the Internet.**
- 2 Apply Silhouette**
- 3 Open the Silhouette user interface.**
  - **After Effects/Premiere Pro: Click the Silhouette Interface > Open button.**
  - **OFX: Click the Open Silhouette Interface button.**

The Silhouette user interface opens.

- 4 Select Help > License.**

The Boris FX License Tool loads.

## 5 Choose Deactivate your license now and press Next.



Silhouette deactivates.

## Node-Locked License Troubleshooting

- 1** It is important that your Silhouette software matches your activation code, so check your purchase order to make sure everything matches up version wise. It may be that you don't have the correct version of Silhouette installed from our download section. This is especially important for legacy software before Silhouette 2020, where a different licensing method is used.
- 2** Check to make sure you are not restricted to using certain ports due to a firewall or other admin permissions. When in doubt, temporarily turn your firewalls off for the duration of the installation and then turn them back on when you are done.
- 3** Troubleshoot your machine; try uninstalling all your Silhouette software, restarting your machine, and installing the software again from scratch, and make sure you follow installation directions off our website exactly. It sounds redundant, but sometimes it's a great way to figure out what is going on inside your machine.
- 4** If all else fails, our support team is happy to help you figure this out. Please contact support.

## Floating Licenses

This section will walk you through the process of installing floating licenses. Installing nodelocked licenses does not require the use of the license manager. See above.

### Floating licenses - How it works

A floating license allows central administration of your license deployment, avoiding the need to manually activate and deactivate our software on every machine, which is particularly beneficial for large facilities.

Configuring a new machine to use your floating license server is very straightforward and requires no Internet connection.

Similarly, replacing a failed machine can be done without needing to contact technical support for the license to be released.

### How do I Install the Floating License Server?

Silhouette uses the Boris FX RLM License server for floating licenses.

You can download the license server from the Boris FX website. See the steps below.

Floating licenses are easy to set up if you are familiar with configuring network services, but if you need any help with the process, please contact technical support.

**Note:** To configure a license server you must have Administrator (or root) privileges.

### Installing Floating Licenses with Online Activation

- 1 Download the RLM License Manager from the download section here: [RLM License Server](#)
- 2 Run the License Manager file then follow the installation prompts.
- 3 Open a Web browser and go to: <http://SERVERNAME:5054/goforms/activate>
- 4 Replace SERVERNAME with the name of the license server.
- 5 Click BEGIN License Activation.
- 6 Enter *activation.genarts.com* in the ISV activation website field and click Next.
- 7 Enter *genarts* in the ISV field.

- 8 Copy and paste your Silhouette Activation Key license that you received from your license email into the License activation key field. Then, click Next.
- 9 Your Ethernet address will auto-populate in the License Server or Node-lock hostid field. Accept the auto-populated Ethernet address
- 10 Enter the number of licenses that should be locked to this server in the License count (for floating licenses) field. Or just enter 0 to assign all licenses to the specified server. Click Next.

A default license location will auto-populate in the License File to create or edit field. Accept the default license location and click Next.

- 11 On the Activation Request Data screen, verify all the information you have entered, and click REQUEST LICENSE.
- 12 On the License Activation page, click on (Re)start License Server.
- 13 Then, on the Reread/Restart Servers page, click on Reread/Restart.  
The license server should now be set up.
- 14 To confirm that the Boris FX license server is working, go to <http://SERVERNAME:5054>
- 15 Replace SERVERNAME with the name of the server, and click Status on the top left hand corner.

genarts should show up under the ISV Servers and it will say Running: Yes.

## Installing Floating Licenses With Offline Activation

In cases where you cannot install the license via an Activation code (normally where the server is not connected to the Internet) you can manually install your license:

- 1 On a machine with Internet access, download the RLM License Manager from the download section here: [RLM License Server](#)
- 2 Install the License Manager on both the machine that has an Internet connection and the offline server you intend to run on.  
**Note:** You will use the online machine to get the license for your offline server.
- 3 On the online computer, open a web browser and go to:  
<http://SERVERNAME:5054/goforms/activate>
- 4 Replace SERVERNAME with the name of the license server.
- 5 Click BEGIN License Activation.

- 6** Enter *activation.genarts.com* in the ISV activation website field and click Next.
- 7** Enter *genarts* in the ISV field.
- 8** Copy and paste your Silhouette Activation Key license that you received from your license email into the License activation key field. Then, click Next.
- 9** The Ethernet address of the machine you are on will auto-populate in the License Server or Node-lock hostid field. You will need to overwrite it with the Ethernet address of the offline license server. To find the Ethernet address on the offline license server:

For RLM Server v13 and newer:

- On Windows: Go to Start > Boris FX RLM Server > Get RLM HostID
- On Mac: In a console type: `/Library/Application Support/BorisFX/rlm/GetHostid.py`
- On Linux: In a terminal type: `/usr/borisfx/rlm/hostid_wrapper.py`

For older versions of RLM Server:

- On Windows: Go to Start > GenArtsRLMServer > Get RLM HostID
- On Mac: In a console type: `/Library/Application Support/GenArts/rlm/GetHostid.py`
- On Linux: In a terminal type: `/usr/genarts/rlm/hostid_wrapper.py`

The command above will print out the results.

- 10** Get the first mac address from the first line: Hostid of this machine.
- 11** Enter the mac address into the online License Server or Node-lock hostid field.
- 12** Enter the number of licenses that should be locked to this server in the License count (for floating licenses) field. Or just enter 0 to assign all licenses to the specified server.
- 13** Click Next.
- 14** A default license location will auto-populate in the License File to create or edit field. Replace the default location to a location that you can easily write to and access the file, such as your Desktop or the Downloads folder.
- 15** Click Next.
- 16** On the Activation Request Data screen, verify all the information you have entered, and click REQUEST LICENSE.
- 17** On the License Activation page, click on (Re)start License Server.
- 18** Then, on the Reread/Restart Servers page, click on Reread/Restart.

**19 Transfer the License File onto the offline license server and save the License File to the RLM directory.**

For RLM Server v13 and newer:

- For Windows: C:\Program Files\BorisFX\rlm
- For Mac: /Library/Application Support/BorisFX/rlm/
- For Linux: /usr/borissfx/rlm/

For older versions of RLM Server:

- For Windows: C:\Program Files (x86)\GenArts\rlm
- For Mac: /Library/Application Support/GenArts/rlm/
- For Linux: /usr/genarts/rlm/

**20 Open the License File in a text editor and edit the file with your offline server's Hostname.**

**21 Open a Web browser on the offline server, go to <http://localhost:5054> and click on (Re)Start License Server.**

This completes the License server set up.

**22 To confirm that the Boris FX license server is working, go to <http://SERVERNAME:5054>**

**23 Replace SERVERNAME with the name of the server, and click Status on the top left hand corner.**

genarts should show up under the ISV Servers and it will say Running: Yes.

Now that everything is installed and activated, you no longer need the RLM server installed on the temporary online computer – you can remove it at this time.

## Installing The Floating License On A Client Machine (Manual Install)

If you haven't yet installed the server license, follow the instructions above in [How do I Install the Floating License Server](#). Once you have the server license installed, perform the following steps to get the client license running.

### Install Floating Client License Using The License Window

**1 Install Silhouette on the client machine.**

- 2 Get the host line from the server license, which looks like this: **HOST ServerName EthernetAddress PortNumber**

For example, HOST camelot 00000000042e 5053

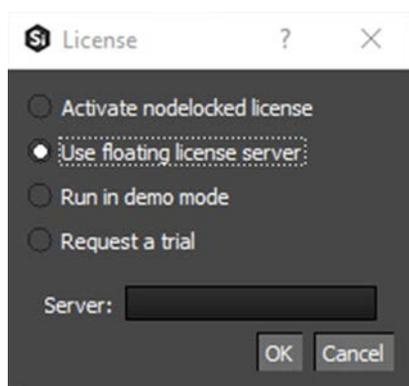
- 3 Apply Silhouette.

- 4 Open the Silhouette user interface.

- After Effects/Premiere Pro: Click the Silhouette Interface > Open button.
- OFX: Click the Open Silhouette Interface button.

The Silhouette user interface opens.

- 5 Select Use floating license in the License window.



- 6 Enter the PortNumber and ServerName from the server license in the Server field in the following format: port@ServerName. In the server license example above, you would enter 5053@camelot

- 7 Click OK.

Your client machine is now connected to the license server.

## Install Floating Client License Using a License File

- 1 Install Silhouette on the client machine.

- 2 Get the host line from the server license, which looks like this: **HOST ServerName EthernetAddress PortNumber**

For example, HOST camelot 00000000042e 5053

- 3 Create a new file in a text editor called silhouette\_client.lic. The file name is not important, as long as the .lic extension exists.

- 4 Paste in the HOST line into the client license file and press enter to create a new line.

- 5** You can either keep the server Mac address in the client or replace it with the word “any”. See example below.

HOST camelot any 5053

- 6** Save the file to the appropriate location. For your particular system this is:

- For Windows: C:\ProgramData\GenArts\rIm
- For Mac: /Library/Application Support/GenArts/rIm/
- For Linux: /usr/genarts/rIm/

The next time you apply Silhouette, your client machine will connect to the license server.

## Install Floating Client License Using An Environment Variable

If you want to point to a license file via environment variable, use `genarts_LICENSE`. It uses the usual RLM syntax, e.g:

```
genarts_LICENSE=5053@server-name
```

```
genarts_LICENSE=/path/to/file.lic
```

You can also set up the RLM environment variable to read all `.lic` files in a directory:

```
genarts_LICENSE=your/rIm/directory
```

**Note:** The `genarts` in the environment variable name must be lower case.

## Troubleshooting Floating Licenses

As with any software, problems may arise during the installation process. Please take a moment to read our troubleshooting section and check for common errors.

If you continue to have issues installing, please contact support and we will be happy to help you. You may contact our support team here:

<https://borisfx.com/support/open-a-case/>

## Verify Server License Has Been Successfully Installed

Check that your license actually exists on the Server.

For RLM Server v13 and newer:

- For Windows: C:\Program Files\BorisFX\rIm

- **For Mac:** /Library/Application Support/BorisFX/rlm/
- **For Linux:** /usr/borisfx/rlm/

For older versions of RLM Server:

- **For Windows:** C:\Program Files (x86)\GenArts\rlm
- **For Mac:** /Library/Application Support/GenArts/rlm/
- **For Linux:** /usr/genarts/rlm/

## **Verify License Server Software Is Latest Version**

Check to make sure your License Manager is up to date.

## **Verify Firewall Is Not Running Between Server And Client**

If your organization needs to run a firewall, you will need to check if the ports for the RLM server are open for use.

## **Check That Silhouette Version Matches Activation Code**

Check your purchase order to make sure everything matches up version wise. It may be that you don't have the correct version of Silhouette installed from our download section. This is especially important for legacy software.

## **Check Conflicting Licenses Installed In Licensing Folder**

If you have more than one Silhouette license installed on the server or client machine check to make sure they are not expired licenses. While rare, sometimes these licenses can conflict with any current ones you have on your system.

## **The Client Does Not Connect Or See The Server Host Name**

If your client machine does not connect to the server based on the server name, try replacing the server name with the IP address of the server instead in the license file. You can easily do this via the License Manager or via a text editor.

## **When In Doubt, Check The Logs!**

Check logs and their paths: Read the logs from Silhouette and from your server. They will tell you all about what is happening to your machine.

## Check Your Firewall Settings

Check to make sure you are not restricted to using certain ports due to a firewall or other admin permissions. When in doubt, temporarily turn your firewalls off for the duration of the installation and then turn them back on when you are done.

## Check Your Host Name Settings

If your client machine is not able to connect to the server you may have a networking issue. Try changing the server name on the client machine to the IP address of the server instead when entering the port@host, or check to see if your host has “.local” appended to the end of it.

## Sometimes The Best Solution Is To Start Again

You might roll your eyes at this one, but try uninstalling, restarting your machine, and installing the software again from scratch. Make sure you follow installation directions off our website exactly. It sounds redundant, but sometimes it's a great way to troubleshoot what is going on inside your machine.

## When All Else Fails...

Contact us! Our support team are more than happy to help you fix any floating license issues you may have. Please contact support here:

<https://borisfx.com/support/open-a-case/>

## Installing Render Licenses

This section will discuss the installation of floating render licenses and how they differ from standard interactive floating licensed.

## Render Floating Licenses vs Interactive Floating Licenses

A render license is a specific kind of floating license that only allows rendering of Silhouette project output.

When you are using a floating license, it is broken into two parts: The interactive portion and the rendering portion.

- 1 If you open Silhouette (and a license is available) you are entering the interactive portion.**

## **2 If you have Silhouette closed and are using the command-line renderer, you are utilizing the rendering portion.**

If the interactive license is in use elsewhere or missing, the Silhouette GUI will become unlicensed and attempting further work may encrypt your project if you choose to save. If you have no interactive floating licenses available to render with, additional render licenses can be helpful to let you free up interactive licenses elsewhere.

### **Workflow For Render Licenses - Example 1**

To help illustrate the Render License workflow, let's look at the following situation:

- **5 floating licenses (interactive)**
- **10 render licenses (render only)**
- **There is only 1 user**

The license server is operating with both sets of licenses.

- **If only one person is using Silhouette on the network, there are 4 interactive and 10 render licenses still available to use.**
- **If only that one person was using Silhouette on the network, they would have 15 render machines available for use including the one they were working with.**
- **If another person started working and all machines were in use for rendering, their version of Silhouette would be unlicensed, as there would be no available seats.**

### **Workflow For Render Licenses - Example 2**

To help illustrate the Render License workflow, let's look at another situation.

- **5 floating licenses (interactive)**
- **10 render licenses (render only)**
- **There are 5 users**

The license server is operating with both sets of licenses.

- **There are 5 people working in Silhouette.**
- **If another user tries to work on a 6th machine, they will open Silhouette unlicensed, because all interactive licenses are in use.**
- **They open an existing Silhouette project (or render from the command line), they will be able to render, because all render licenses are available.**

Now, what if one person wants to send off a render to the network?

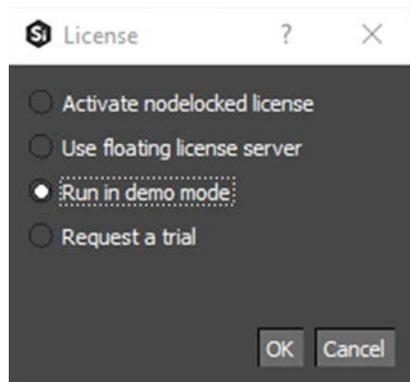
- If 5 people are using Silhouette on the network already, there would be 11 render machines available for use including the one the user was presently working with.
- If another person stopped working in Silhouette, the interactive license would be released, and a new machine would then be free to either use for work (interactive) or render (non-interactive) by another user.

## Installing Render Floating Licenses

The installation of a render license is exactly the same as that of a standard interactive floating license. See [Floating Licenses](#) for a complete guide.

## Run in Demo Mode

Runs Silhouette in a watermarked demo mode which does not allow saving, exporting or rendering.



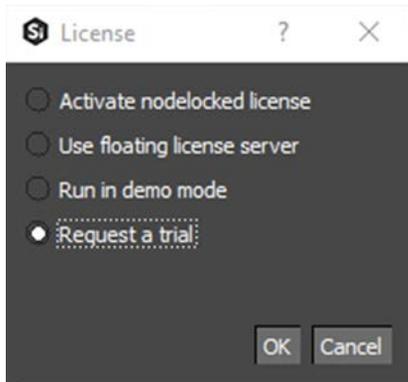
## Request A Trial

Request a 15 day, unrestricted trial license.

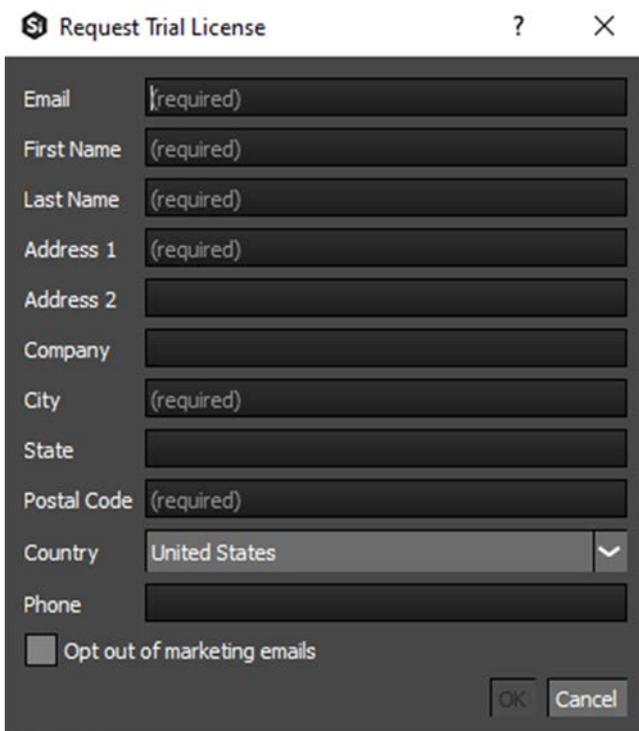
**Note:** Internet access is required for nodelocked trial licenses.

### Node-locked License Trial

- 1 Select Request a trial and click OK.



- 2 Fill out the Request Trial License form that appears and click OK.

A screenshot of a "Request Trial License" form. The form has a title bar with a question mark icon and a close button. It contains several input fields: "Email" (required), "First Name" (required), "Last Name" (required), "Address 1" (required), "Address 2", "Company", "City" (required), "State", "Postal Code" (required), "Country" (dropdown menu showing "United States"), and "Phone". At the bottom, there is a checkbox labeled "Opt out of marketing emails" and "OK" and "Cancel" buttons.

A 15 day trial license is automatically installed.

## Floating License Trial

- 1** Request a Silhouette floating trial license here: [Contact Us](#)
- 2** Fill out the required information indicating that you would like a Silhouette floating trial license and if you have a current RLM license server, provide your server's Hostid and name.



## TUTORIALS

# Applying the Silhouette Plug-in

### 1 Start your host application and apply Silhouette:

- **After Effects: Apply Silhouette Paint to a clip in the timeline from the Effects > Boris FX Silhouette menu.**
- **Premiere Pro: Apply Silhouette Paint to a clip in the timeline from the Effects > Video Effects > Boris FX Silhouette group.**
- **OFX: The method for applying an OFX plug-in varies. Consult the OFX software documentation for details.**

### 2 To use Optional Clone Sources inputs in Silhouette:

- **After Effects/Premiere Pro: Select the layers using the Optional Clone Sources > Input 1-2 pop-up menus.**
- **OFX: For node based hosts, connect sources to the Silhouette node's Input 1-2 inputs. For layer based hosts, select the layers using the Silhouette plug-in's Optional Clone Sources > Input 1-2 pop-up menus.**

**Note:** In Vegas, when an optional clone source is required, create two tracks with the clone source on the bottom track and the foreground (what you are painting on) on the top track. Silhouette Paint is then applied to the top track by clicking the Composite Mode icon in the track controls, navigating to the Custom > Boris FX Silhouette category and selecting Silhouette Paint.

### 3 If you want to preserve the source alpha, change the Source Alpha parameter to Preserve Alpha.

**Note:** By default, the source alpha is cleared. This is so you can use roto shapes to assist in painting.

### 4 Open the Silhouette user interface.

- **After Effects/Premiere Pro: Click the Silhouette Interface > Open button.**
- **OFX: Click the Open Silhouette Interface button.**

The Silhouette user interface opens.

### 5 When prompted, enter the name of your Silhouette project, set the Working Depth and click Create Project.

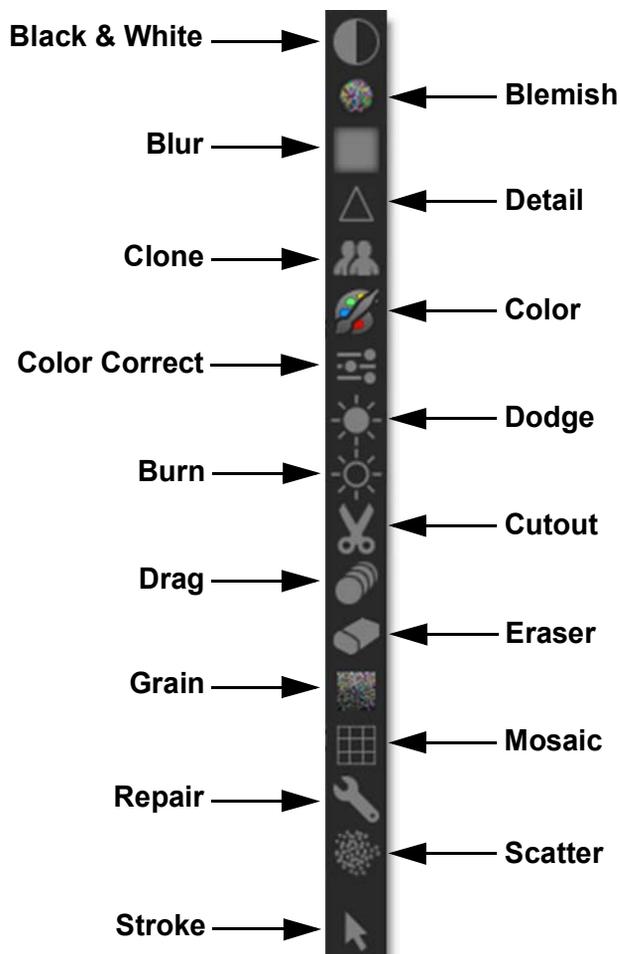
In most cases, the Working Depth should match the host application's bit depth.

# Paint

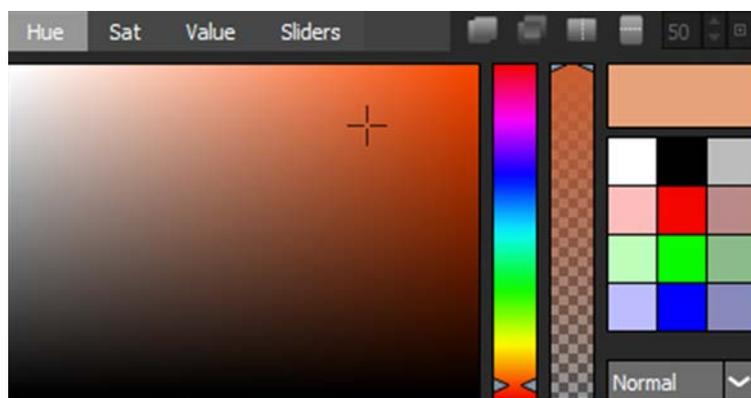
Silhouette provides a wide variety of paint tools that are organized into Presets, Brush, Profile and Paint tabs.



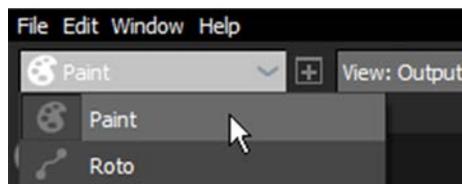
In addition, a number of different brushes are selectable from the Paint Toolbar to the left of the Viewer.



Once a brush is selected, its controls appear on the left side of the Paint window.



- 1 Select Paint using the Node Selector at the top left of the Viewer.



You can select either the Paint or Roto nodes. Once selected, the node's Toolbar and parameters appear.

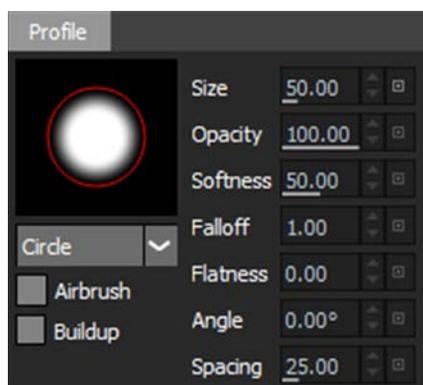
Silhouette internally is a node based system and is made up of Paint, Roto and Source nodes. The Source is connected to the Roto node and the Roto node to Paint. This allows you to create shapes and trackers in the Roto node to be used in Paint for tracking paint strokes as well as holdout mattes for painting.

- 2 Select the Color brush (Shift-C). By default, it is preset to white.



- 3 Paint on the image in the Viewer by pressing and dragging with your pen or clicking and dragging with your mouse. You can quickly draw straight lines if you press Alt, click and then click in a different location. If you keep Alt depressed while clicking, you will create interconnected straight lines.

- 4** In the Paint window's Profile tab, adjust some of the settings to see how it changes your brush.



In addition to the Profile > Size control, the brush can also be resized by using the [ and ] bracket keys in the Viewer or by holding **Ctrl/Cmd** and dragging the brush outline.

- 5** Experiment with some of the other brushes in the Brush Toolbar.
- 6** Adjusting the brush parameters located on the left side of Paint window will change the effect of the brush when you paint.

By default, you are painting on the RGB channels of the image. However, you can paint individually on the red, green, blue or alpha channels as well as simultaneously paint on the RGB and alpha channels using the Paint tab.

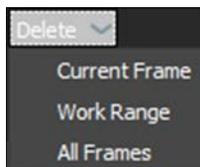


- 7** In the Paint window's Paint tab, click on R to paint only the Red channel.
- 8** Paint on the image.
- 9** If you view the individual Red, Green and Blue channels using the RGBA buttons in the Viewer, you will see that only the Red channel is affected.



- 10** Select the horizontal white bar above the RGBA buttons to quickly toggle the display of the image back to full color mode.

At any time, you can clear all paint strokes and restore the original unpainted frames by using Delete in the Paint tab. You can restore the Current Frame, the Work Range, or All Frames.



**11** In the Paint tab, select Delete > All Frames to clear all paint strokes on all frames.

**12** Go to frame 1 of the clip and paint on the image.

**13** Advance to frame 2.

As you change frames in the clip, the painted frames are stored to disk. Paint on the current frame is also saved with File > Save.

**14** Go back to frame 1 and you will see that your paint stroke has been recorded.

**15** Paint some more frames in the clip.

As frames are painted, a marker is shown in the Timebar to provide a visual display of which frames are painted.



## Paint Presets

Brush presets can be saved using the Presets tab on the left side of the Paint window. It allows you to save all of the brush parameters as a preset.

- 1 To save a preset, select a brush and adjust its controls.
- 2 Click Save and then choose one of the numbered presets.



**Note:** Saved presets are highlighted blue. Clicking a blue preset after selecting Save will overwrite it.

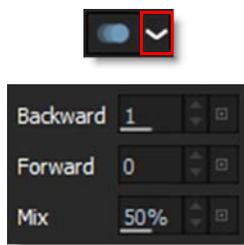
Once saved, you can use the **Alt-0** through **Alt-09** keyboard shortcuts to quickly select one of the presets.

- 3 Clear a paint preset by pressing Save, then Alt-clicking on the preset.

## Onion Skin

The Viewer > Onion Skin mode is useful for creating frame by frame, hand painted animations. Onion Skin does a mix, as defined by the Mix value, between the current frame and either previous or later frames.

- 1 Click the Onion Skin icon in the Viewer and then the down bracket to reveal the controls.



By default, Onion Skin is set up to display a mix to the previous frame.

- 2 To change the Onion Skin frame range, adjust the Backward/Forward numeric fields.

## Clone Brush

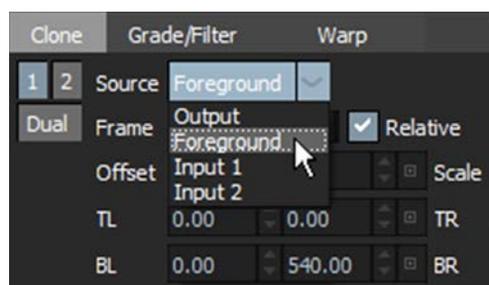
Paints with sampled pixels from an image with the ability to grade (color correct), blur, sharpen or warp the clone source.

### Selecting the Clone Source

- 1 Choose the Clone brush (C) from the Toolbar.



- 2 In the Clone controls, select Output, Foreground or Input 1-2 in the Source pop-up menu.



Output is the painted output and when selected, clones from previously painted areas. Foreground clones from the foreground image, while Input 1-2 are optional clone sources which must be hooked up in the host application before launching Silhouette.

**Note:** Resolve does not allow more than one input for plug-ins that use custom user interfaces. A future Resolve software update will be required to accommodate multiple inputs.

- 3 If you'd like, set the Frame parameter to choose which source frame to paint from.

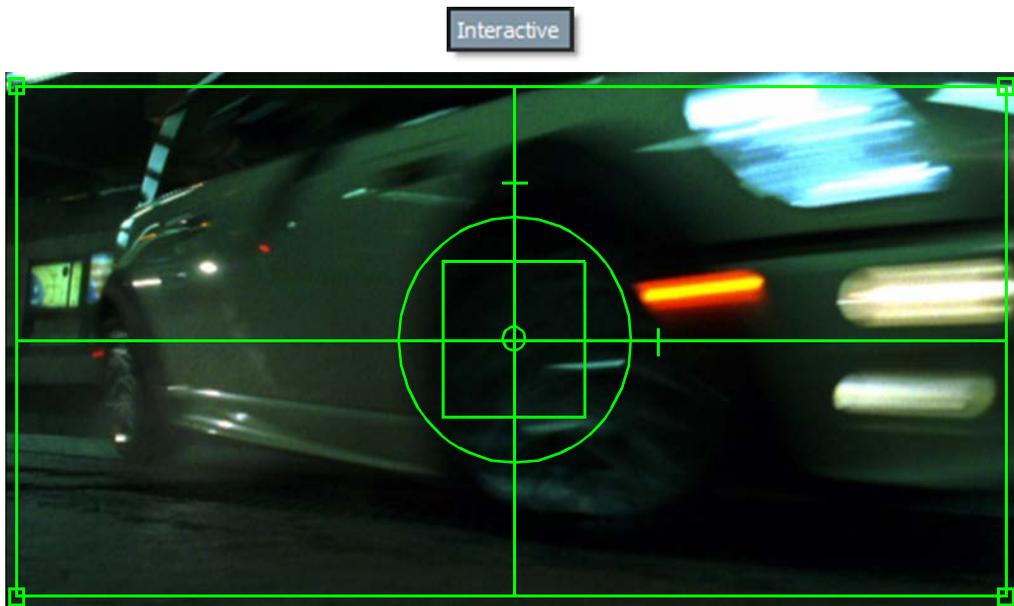
## Setting the Clone Offset

Set your clone source offset by one of the following methods:



- 1** Shift-clicking, dragging and releasing in the Viewer.
- 2** Press and hold down the Shift key. Click once to set the clone source and click once again in a different location to set the Clone target.
- 3** Press Q (Translate), W (Rotate) or E (Scale) and click and drag to translate, rotate or scale the clone source. Onion Skin mode is automatically activated once the Q, W or E key is pressed. Press whatever key you pressed (Q, W or E) again to deactivate the mode.

#### 4 Turn on Interactive mode and use the on-screen controls.



- Use the up, down, left and right arrow keys to nudge the clone source.
- Adjust the Position (Offset), Scale, Rotate, and Corner-Pin > TL (Top Left), TR (Top Right), BL (Bottom Left) and BR (Bottom Right) numeric fields.

### Clone Transform On-Screen Controls

<u>Shortcut</u>	<u>Action</u>
Drag within large center circle	Moves the clone source
<b>Shift</b> -drag within large center circle	Constrain clone source movement horizontally or vertically
Drag the center square horizontal and vertical halfway points	Scales the clone source horizontally or vertically
Drag a center square corner	Proportionally scale the clone source
Drag large center circle	Rotate the clone source
<b>Ctrl/Cmd</b> -drag large center circle	Rotates the clone source with finer control
Drag handles on corners of image	Corner-pins the clone source
Drag dash above large circle	Skews the clone source horizontally
Drag dash to the right of large circle	Skews the clone source vertically

## Setting the Clone offset on different images

Oftentimes, you need to align the same feature in two different frames of a clip when painting with the Clone brush.

- 1 In the Clone controls, select Output, Foreground or Input 1-2 in the Source pop-up menu and then set the Frame parameter to choose which source frame to paint from.

- 2 Press the ' key (located to the left of 1 key).

The clone source image automatically appears in the Viewer.

- 3 Set the Onion-Skin mix to 100.

- 4 Click on the clone source feature that you want to paint from.

The Clone target image automatically appears in the Viewer.

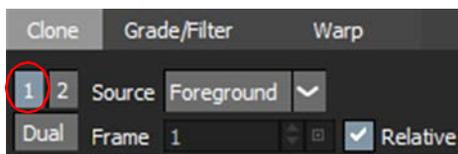
- 5 Click on the Clone target feature that you want to paint on.

The Clone offset is set.

## Dual Clone Brush

Two Clone presets can be activated at once. This allows you to paint from two different images or locations, using separate Transform, Grade/Filter and Warp settings.

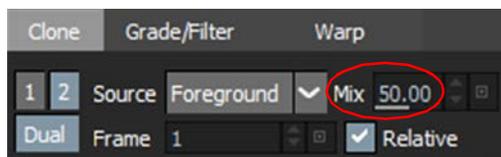
- 1 Select the number 1 Clone preset.



- 2 Set the clone source Transform, timing, Grade/Filter and Warp controls.
- 3 Choose the number 2 Clone preset and set its clone source Transform, timing, Grade/Filter and Warp controls.
- 4 Press the Dual icon below the presets.



A Mix control now appears at the top right of the Clone controls.



- 5 Change the Mix parameter to set the relative opacity of the two clone sources.
- 6 When you paint, both Clone presets will contribute to the painted result.

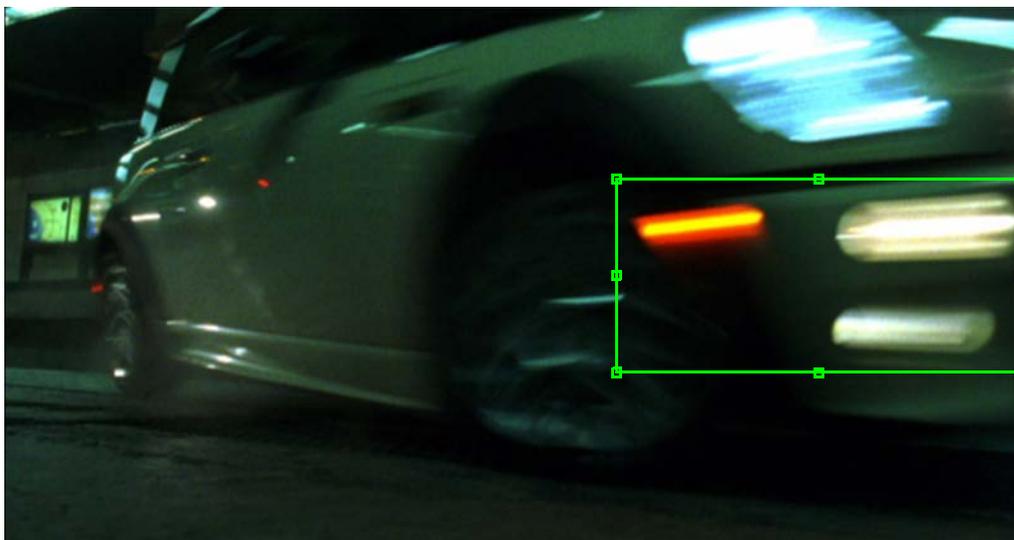
## Define a Clone Transform Region

You can change the position and size of the Clone transform on-screen control rectangle which allows the effect of the corner-pin to be controlled from a specific region.

- 1 Press the Region button to enable it.

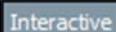


- 2 Click-drag to create a region.



- 3 Alt-click and drag to create new region when one already exists.
- 4 Click and drag inside a region to move it or drag the region handles to resize.

- 5** When you are ready to adjust the Clone transform, enable Interactive mode.


 A rectangular button with a dark background and the word "Interactive" in white text.

**Note:** When there are no on-screen controls (center square and circle) within the Clone transform bounding box, a region is active.

- 6** Use the on-screen controls to adjust the clone source.

The effect of the corner-pin is now controlled by the region, and the scale and rotation anchor points are set to the region's center.

- 7** To clear a region, enable Region and tap outside a region box without dragging.

## Using Brush Compare Modes With the Clone Brush

Four brush compare modes preview brush settings prior to painting. You can choose from Onion Skin, Align, Vertical Split and Horizontal Split.



The **Caps Lock** key toggles the compare modes on and off.

**Note:** The compare modes are not available for the Drag, Repair, and Cutout brushes. Onion-Skin and Align mode only work with the Clone brush.

- 1** Activate Onion Skin or compare mode if you need to line up the clone source and target images.

- Select the Onion Skin icon to activate it and then align the clone source.



or

- Select the Align icon to activate it and then align the clone source.



Align inverts the clone source and mixes it with the foreground, creating an embossed effect when similar images are not aligned. When perfectly aligned, the Viewer appears gray or black depending on the state of the Paint > Clone > Alignment Type preference.

Not Aligned



Aligned



**2** Once the clone source offset is set, deactivate Onion Skin or Align mode by:

- Clicking the selected icon.

or

- Pressing the Caps Lock key to toggle the compare mode off.

Very often, you will encounter two images from the same location that are not color matched.

**3** If the clone source needs to be color corrected to match the area to be painted, select the Grade/Filter tab.

**4** Choose the Vertical Split icon to compare the clone source and target using a split screen.

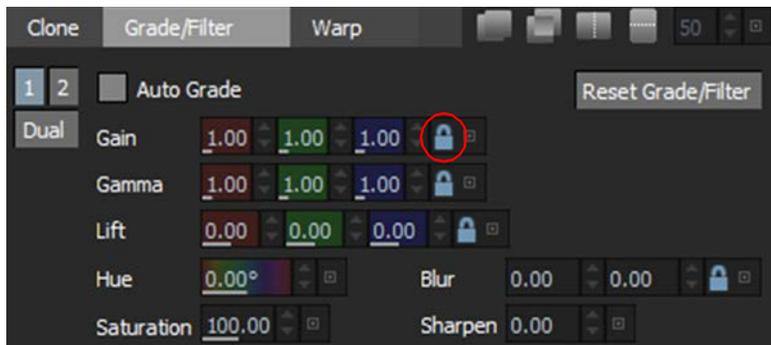


The split is handy when using the Grade/Filter controls to color match the clone source to the target.

**Note:** The | key (vertical bar) keyboard shortcut snaps the vertical split position to the cursor position.

**5** Adjust the Gain/Gamma/Lift numeric controls by dragging on them.

- 6 Click the Lock icon to move the numeric fields individually. This un-gangs them.



**Note:** Once a Grade/Filter or Warp parameter has been adjusted, a green dot appears to the right of the tab to indicate that a change was made.

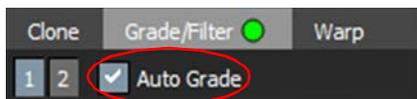


- 7 Prior to painting, click the Vertical Split icon to disable it.

## Automatic Color Correction

The Grade/Filter > Auto Grade feature automatically color corrects the clone source to match the location you are painting.

- 1 **Select the Grade/Filter tab.**
- 2 **Enable Auto Grade.**



- 3 **Paint a stroke.**

Now, when you paint, Silhouette automatically color corrects the clone source to match the location you are painting.

**Note:** The Gain, Gamma, Lift, Hue and Saturation controls are disabled when using Auto Grade.

## Manual Color Correction

The steps below contain some useful tips when doing manual color correction.

- 1 **Select the Grade/Filter tab.**
- 2 **Make sure Auto Grade is not enabled.**
- 3 **Choose the Vertical Split icon to compare the clone source and target using a split screen.**



The split is handy when using the Grade/Filter controls to color match the clone source to the target.

- 4 **Move your cursor into the image area over the split line and when the cursor changes to a double-arrow, click and drag to move the split line to the location where you will be painting and where you want to do the color matching. The split line may not be obvious, so white triangles on the edges of the Viewer will help you find it.**

By isolating individual color channels, it is easier to match the colors.

- 5 **In the Viewer, look only at the Red channel (Alt-R).**

- 6 Ctrl/Cmd-drag (for finer accuracy) the Gain > Red numeric field so that the luminance values on either side of the split line match.**

**Tip:** Set your Update mode to Drag or Adaptive. As you drag a parameter, Silhouette is constantly rendering. This makes the color adjustments more interactive.

- 7 In the Viewer, look only at the Green channel (Alt-G).**
- 8 Ctrl/Cmd-drag (for finer accuracy) the Gain > Green numeric field so that the luminance values on either side of the split line match.**
- 9 In the Viewer, look only at the Blue channel (Alt-B).**
- 10 Ctrl/Cmd-drag (for finer accuracy) the Gain > Blue numeric field so that the luminance values on either side of the split line match.**
- 11 Press Alt-B again to toggle off the Blue channel and to display the RGB channels in the Viewer at the same time.**

Your clone source and target should now be color matched.

- 12 Toggle off the Vertical Split and paint the image.**
- 13 To reset the Clone offset, press Shift and without moving the cursor, click your mouse or tap your pen on the screen once.**

The Clone offset is quickly set to a 0,0 offset.

## Using Clone > Warp

The Warp tab in the Clone Brush allows you to warp specific image areas using pins, while leaving other areas untouched. Adjustments can range from subtle nip and tucks to something more obvious like repositioning an arm or leg.

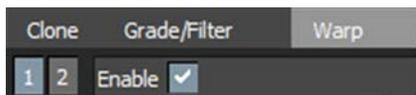


Photo by Tim Easley on Unsplash

- 1 Choose the Clone brush (C) from the Toolbar.



- 2 Select the Warp tab.

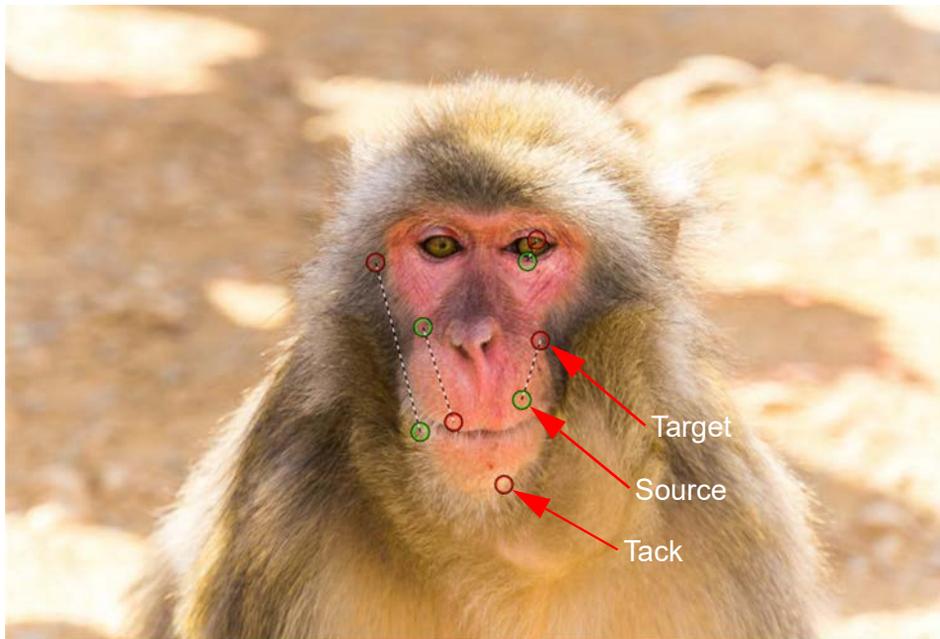


When the Warp tab is selected, Onion Skin mode is automatically activated so you can see the warp effect once a pin is added.

**Tip:** Change the Mix value to 100 if you want to see the warped image at 100%.

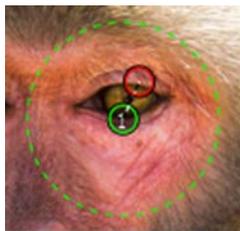
- 3 Click-drag on the image to create a pin that contains a source and target. The farther the target (red circle) is dragged from the source (green circle), the more the image warps. You can add up to 20 pins.
- 4 To constrain the warp, click-release on the image to set a tack.

The tack acts as a barrier and limits the effects of the warp.



In addition, each pin and tack has a radius which determines its strength.

- 5** Hover over a pin to display the radius.



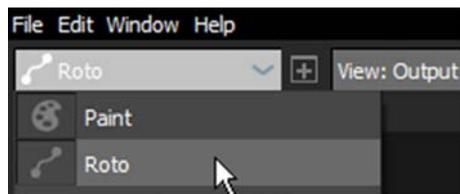
- 6** Shift-drag the pin radius to adjust it.
- 7** To track the pins and tacks, select a tracked layer from the Warp > Transform pop-up menu.

The pins and tacks are now transformed by the motion of the tracked layer.

## Display Roto Shape Outlines In Paint

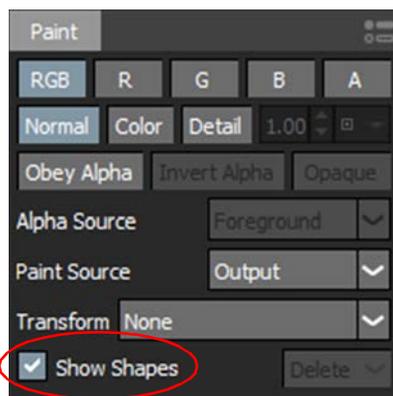
Roto shape outlines can be displayed in Paint. This is useful to determine the edge of a shape's alpha channel without viewing it.

- 1 **Select Roto using the Node Selector at the top left of the Viewer.**



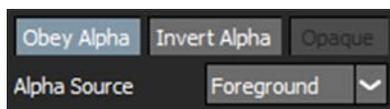
The Roto node is where the shape tools are located.

- 2 **Create a shape around an object. See the [Roto](#) tutorial for more information.**
- 3 **Select Paint in the Viewer > Node Selector.**
- 4 **Enable Show Shapes in the Paint tab.**



The shape outlines from Roto can now be seen in Paint.

- 5 **Enable Obey Alpha with Alpha Source set to Foreground.**



Painted strokes will now only appear within the area of the Foreground alpha.

- 6 **Click Invert Alpha to paint outside of the input alpha.**

See the [Obey Alpha - Use Input Alpha](#) section for more information.

# Alpha Channels

Alpha channels can be used to control where you paint in the RGB channels with the source of the alpha coming from an image or by painted strokes. Alpha channels can also be painted on and modified.

## Obey Alpha - Using Painted Alpha

### Paint Temporary Alpha

Painting temporary alpha can limit where you paint in the RGB channels.

- 1 Select the Color brush (Shift-C).



- 2 Enable only the A channel in the Paint tab.



- 3 Press the A key once to superimpose the alpha channel over the image.

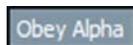
Now when you paint, you will see the alpha channel superimposed as a blue color over the RGB channels.

- 4 Paint over an area of the image.
- 5 Press the A key twice more to remove the alpha overlay.
- 6 Disable A and enable RGB.

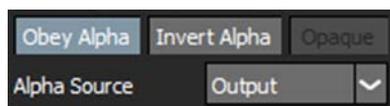


### Obey Alpha

- 1 Enable Obey Alpha in the Paint tab.



- 2 Set the Alpha Source to Output.

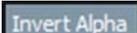


Output uses the painted output alpha as the obey alpha source.

### 3 Paint some strokes.

When you paint, you can only modify the RGB channels in the area of the painted alpha.

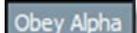
### 4 If you'd like, enable Invert Alpha to paint the RGB channels anywhere but where the alpha exists.



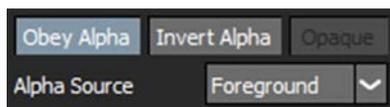
## Obey Alpha - Use Input Alpha

The alpha from source layers and images can be used to control where you paint.

### 1 Enable Obey Alpha in the Paint tab.



### 2 Set the Alpha Source to Foreground or Input 1-2.

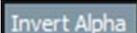


- **Foreground:** Obeys the alpha from the Foreground input or the Roto node's shapes.
- **Input 1-2:** Obeys the alpha from the Clone sources.

### 3 Paint some strokes.

When you paint, you can only modify the RGB channels in the area of the input alpha.

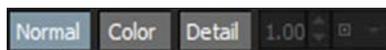
### 4 If you'd like, enable Invert Alpha to paint the RGB channels anywhere but where the alpha exists.



**Note:** To view the input alpha, you will need to switch the View pop-up menu to the source containing the alpha.

## Detail Separation In Paint

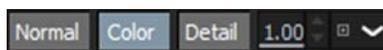
Paint separates the image into color and detail layers. By default, the color and detail layers are painted simultaneously in Normal mode, but can also be painted separately in Color and Detail modes. Painting in Color mode preserves detail while painting in Detail mode preserves color.



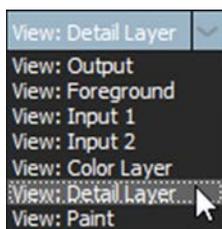
### Preserving Detail

Selecting Color mode preserves detail and only affects the color layer. This is useful for evening out the color and tone of the image.

- 1 Click the Color button in the Paint tab.

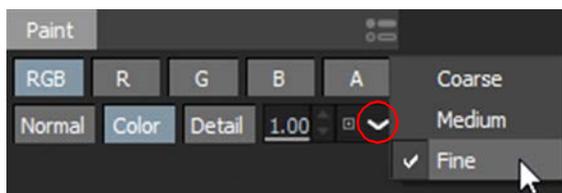


- 2 Select View > Detail Layer or press the 9 keyboard shortcut.

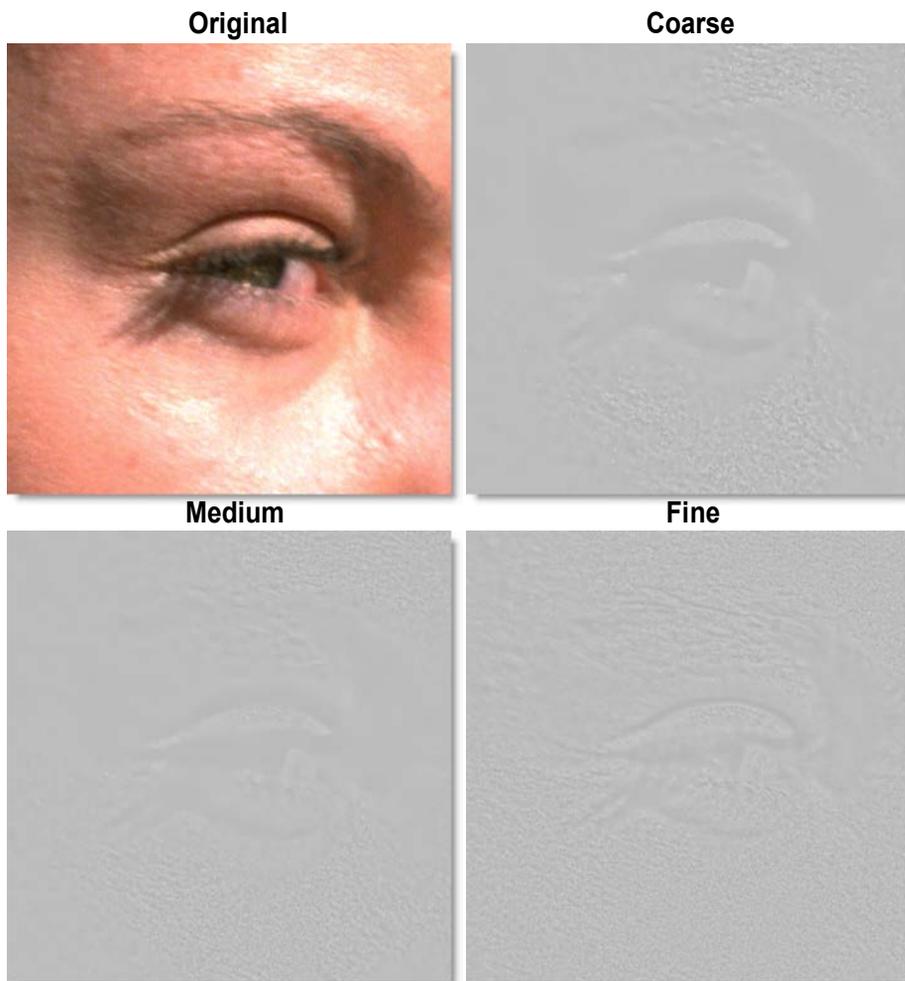


The Detail Layer is now displayed in the Viewer.

- 3 Click the pop-up menu to the right of Detail Level field and select the Fine preset.

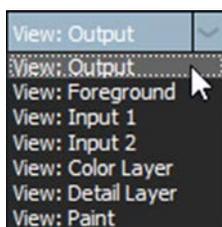


This sets the Detail Level to 1 which selects fine details such as skin blemishes, pores, hair, and wrinkles. A Detail Level of 0 is coarse detail, .5 is medium detail and 1 is fine detail.



**Note:** You can also variably set the Detail Level using the numeric field.

- 4 Select View > Output or press the 1 keyboard shortcut.



The output of Paint is now displayed in the Viewer.

**Note:** With the exception of Cutout and Eraser, all brushes can be used in the Color and Detail modes.

- 5 Use the Dodge brush (Alt-Shift-D) to lighten areas in the image or the Burn brush (Alt-Shift-B) to darken areas in the image.**

Color Only - Before



Color Only - After



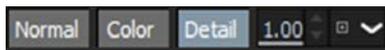
As you paint, only the color layer is affected and detail is preserved.

- 6 Use the Clone, Blur and Drag brushes to even out the color and tone.**

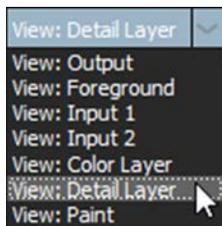
## Modify Detail

Selecting Detail mode preserves color and only affects the detail layer.

- 1 Click the Detail button in the Paint tab.



- 2 Select View > Detail Layer or press the 9 keyboard shortcut.



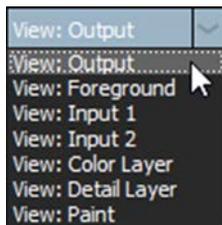
The Detail Layer is now displayed in the Viewer.

- 3 Drag in the Detail Level field to set a value of 1.



A value of 1 selects fine details.

- 4 Select View > Output or press the 1 keyboard shortcut.



The output of Paint is now displayed in the Viewer.

- 5 Select the Clone brush (C), set an offset and paint in an area of texture.

Detail Only - Before

Detail Only - After



The detail is modified and the color layer is preserved. Fine details in this example are removed without affecting with the color and tone.

- 6 Use the Color brush (Shift-C) with a 50% gray color to remove texture completely.

# Auto Paint

Auto Paint is a highly unique automated paint feature that records all paint activity with tight integration of both point and planar trackers. Paint strokes can be match moved or stabilized giving Silhouette the speed of raster paint with the repeatability of vector paint. The beauty of the system lies in the automatic recording of the paint strokes and brush settings. Individual paint strokes can be selected and repeated over many frames, as well as deleted. If the original footage changes, the entire paint history can be used to rebuild the painted shot, automatically.

## Replay Last Stroke

- 1 Paint a stroke.**
- 2 Change to a different frame.**
- 3 Press Replay in the Auto Paint window.**



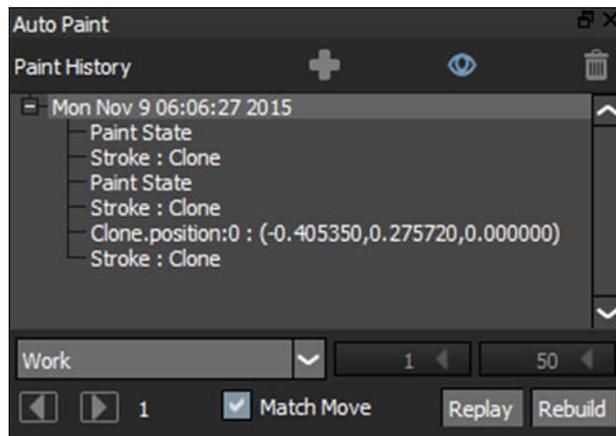
The last stroke is replayed on the new frame. Replay can be used to apply the last stroke with changed settings and/or on a different frame.

## Event Playback

- 1 Go to frame 1 and paint some strokes.**

Groups are created each time painting is started on a frame and recorded with the current time stamp. So the first time you begin painting on frame 1, for instance, a renamable “event group” containing a current time stamp is created. Then, events are created for the current paint state: channels/flags, brush

profile, brush, and brush parameters. And finally, a new stroke event is created for the new stroke. After the first stroke, state changes are stored in their own events (ie. Brush Size change, Opacity, etc).



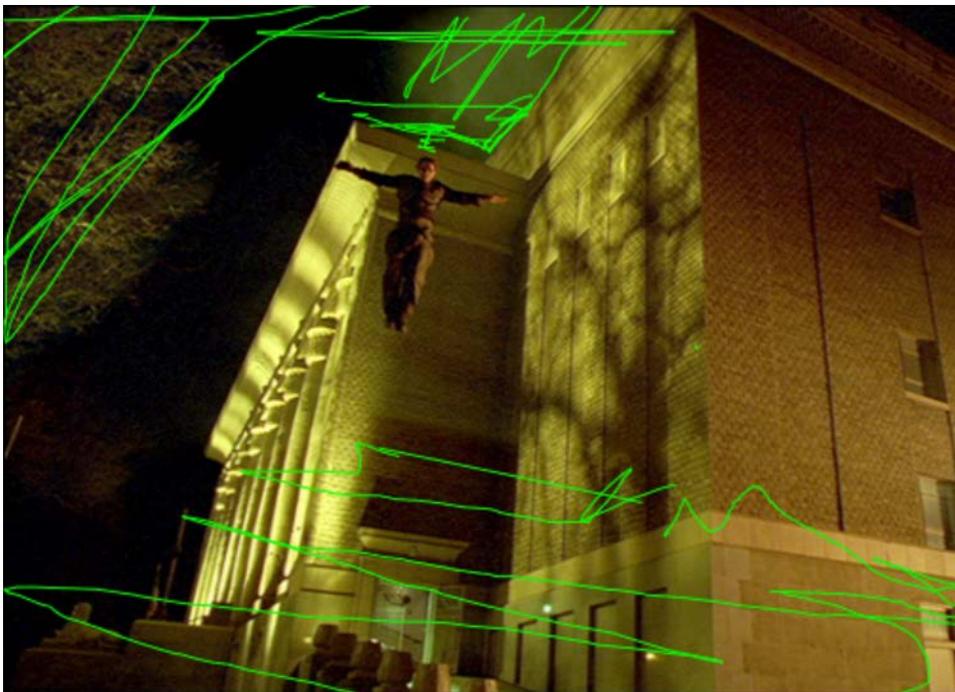
- 2** In the Paint History, select the frame number group, paint event group, or a subset of the paint events you want to play back.

or

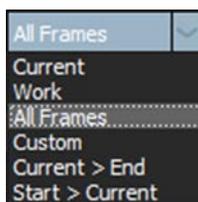
- 3** Choose the Stroke (S) tool and select strokes by clicking or drag selecting in the Viewer. Hold Shift to add to the selection and Ctrl to toggle the selection.



When strokes are selected, they are highlighted in the Viewer and the Paint History.



- 4 In the Auto Paint window, choose an option from the Frame Range pop-up menu.



If you choose Custom, you will be able to enter values in the numeric input fields.

- 5 Press either the Play Selected Events Forward or Backward icon in the Auto Paint window.



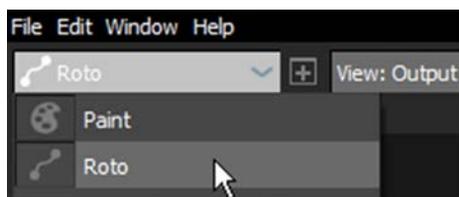
This will play back all of the selected events for the desired frame range. The playback is smart, so if you try to play back starting on the frame from where the source events are coming from, it will skip this frame and just move on to the next.

As it plays, Silhouette copies the paint events from the start frame on to the end of the history for successive frames, as if you were manually performing those events.

## Event Playback - Tracking Paint Strokes

Let's suppose you want to paint out some facial blemishes on frame 1 and apply those strokes to the rest of the clip, while taking into account the camera movement. With Silhouette's Auto Paint features, you can easily do this by playing back the paint strokes from frame 1 and using tracking data to match move the strokes on successive frames.

- 1 **Select Roto using the Node Selector at the top left of the Viewer.**



The Roto node is where the Tracker tool is located.

- 2 **Choose the Tracker (Shift-T) in the Toolbar.**



- 3 Track the area that you want to paint. See the [Tracker](#) tutorial for more information.

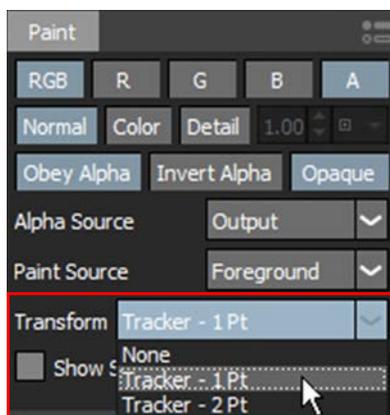


- 4 Select Paint in the Viewer > Node Selector.
- 5 Choose a brush and paint some strokes that you would like to duplicate over the entire clip.

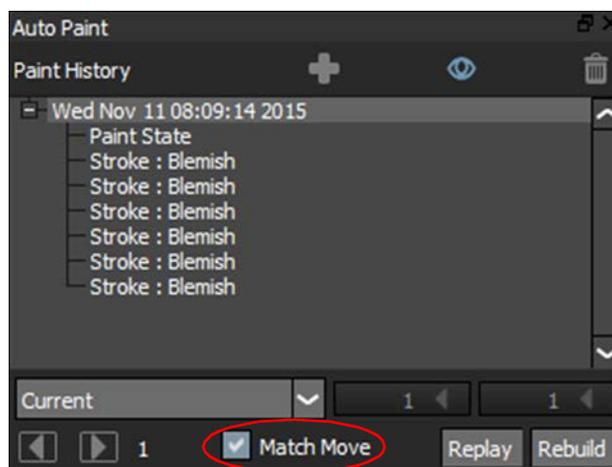
For this image, I used the Blemish brush to remove acne from the girl's face.



- 6 Select a tracked layer in the Paint tab's Transform pop-up menu.

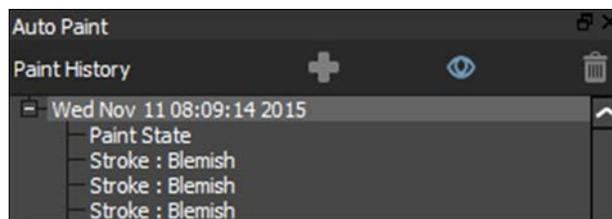


- 7 Enable Match Move located at the bottom of the Auto Paint window.**

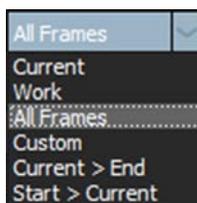


Activating Match Move will use the tracking data from the selected layer and apply it to the paint strokes when playing back selected events.

- 8 In the Paint History, select the paint event group or a sub set of the paint events you want to play back. In this example, selecting the top group is good.**



- 9 In the Auto Paint window, select All Frames from the Frame Range pop-up menu.**



- 10 Press either the Play Selected Events Forward or Backward icon in the Auto Paint window.**



The paint strokes from the start frame are duplicated on successive frames with tracking data applied to them so they will follow the motion of the clip.

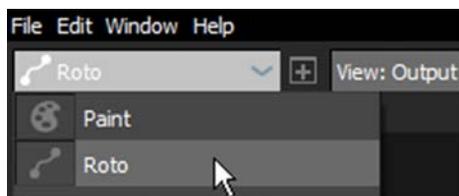
## Event Playback -Tracking the Clone Source

Tracking the clone source is useful for when you want the clone source to match the motion of the clip you are painting on.

- 1 In the host application, make sure you first select both a foreground and Clone source before opening the Silhouette interface.
- 2 Open the Silhouette user interface.
  - After Effects/Premiere Pro: Click the Silhouette Interface > Open button.
  - OFX: Click the Open Silhouette Interface button.

The Silhouette user interface opens.

- 3 Select Roto using the Node Selector at the top left of the Viewer.



The Roto node is where the Tracker tool is located.

- 4 Choose the Tracker (Shift-T) in the Toolbar.



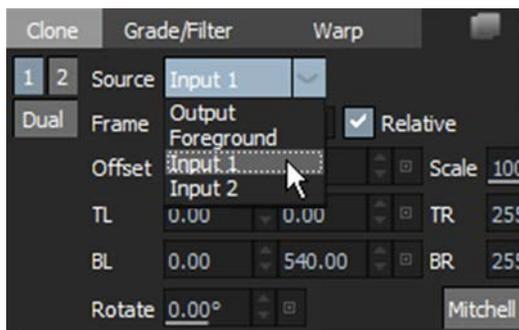
- Track the area that you want to paint. See the [Tracker](#) tutorial for more information.



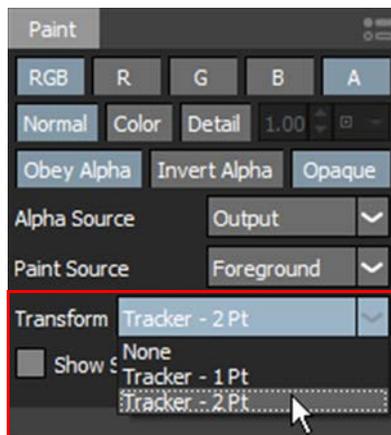
- Select Paint in the Viewer > Node Selector.
- Choose the Clone Brush (C) in the Toolbar.



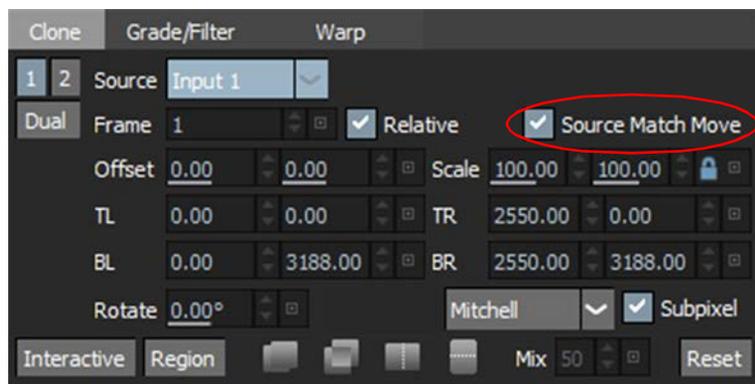
- Select the Clone source by choosing Input 1 from the Clone > Source pop-up menu.



- 9** Choose a tracked layer in the Paint tab's Transform pop-up menu.



- 10** Enable Source Match Move in the Clone transform controls.



Selecting a layer and activating Source Match Move in the Clone transform controls applies the tracking data of the selected layer to the clone source. In this configuration, the painted clone source is match moved.

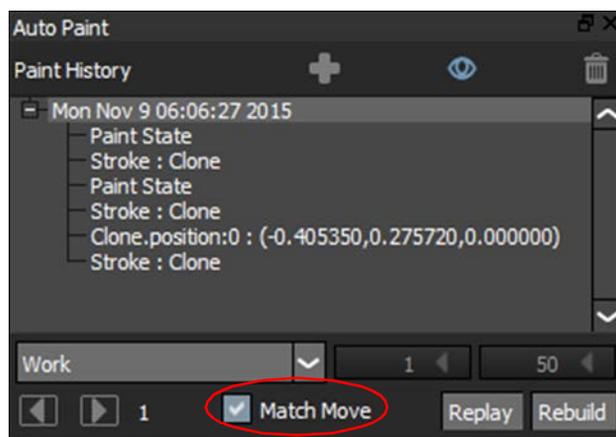
- 11** Paint some strokes that you would like to duplicate over the entire clip.

For this image, I am painting a graphic into the face of the watch.



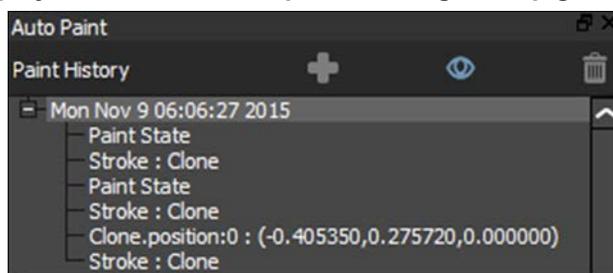
Once you are done painting the frame, you can then duplicate it over the rest of the clip.

## 12 Enable Match Move located at the bottom of the Auto Paint window.

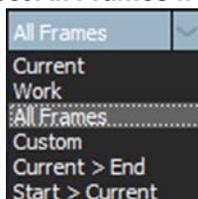


Activating Match Move will use the tracking data from the selected layer and apply it to the paint strokes when playing back the events.

- 13** In the Paint History, select the paint event group or a sub set of the paint events you want to play back. In this example, selecting the top group is good.



- 14** In the Auto Paint window, select All Frames from the Frame Range pop-up menu.



- 15** Press either the Play Selected Events Forward or Backward icon in the Auto Paint window.

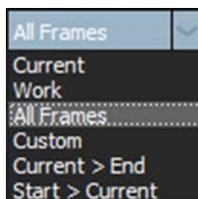


The paint strokes from the start frame are duplicated on successive frames with tracking data applied not only to the paint strokes but to the clone source as well.

## Rebuild

The Rebuild feature in the Auto Paint window will rebuild the paint events for all frames defined in the Frame Range in the order in which they were painted. This is useful if you replace your footage with a different color correction than the original and want the result of painting with the Clone brush to match the new footage.

- 1** In the Auto Paint window, select All Frames from the Frame Range pop-up menu.



- 2** Click the Rebuild button in the Auto Paint window.



# Tracker

## Planar Trackers

Silhouette includes two Planar Trackers: Silhouette's Planar Tracker and the Mocha Planar Tracker. Regardless of which one you use, the workflow is the same.

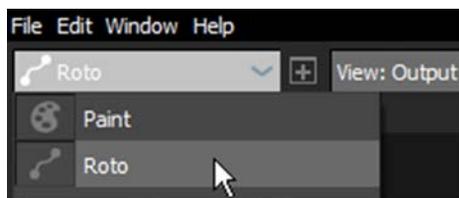
The key to getting the most out of the Planar and Mocha trackers is to learn to find planes of movement in your shot which coincide with the object that you want to track. Sometimes it will be obvious--other times you may have to break your object into different planes of movement. For instance, if you were tracking a tabletop, you would want to draw a spline to avoid a flower arrangement in the center of the table, since it is not on the same plane and will make your track less accurate.

Both the Planar and Mocha trackers require a selected layer with at least one shape in it to drive the tracker.

**Note:** If shapes are selected and not in a layer, clicking the Track Forward/Backward buttons will create a new layer, select it and begin tracking.

If shapes are selected in an unselected layer, clicking the Track Forward/Backward buttons will select the layer and begin tracking.

- 1 **Select Roto using the Node Selector at the top left of the Viewer.**



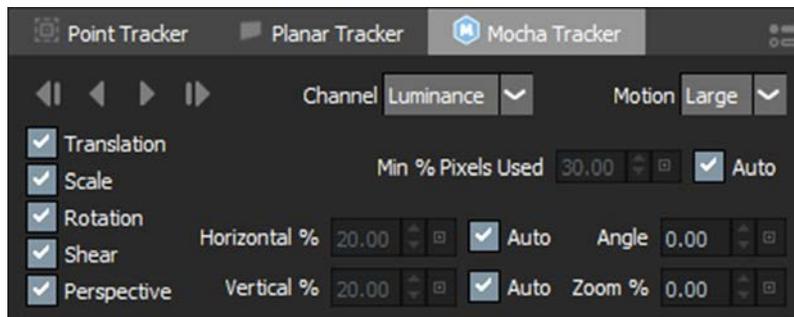
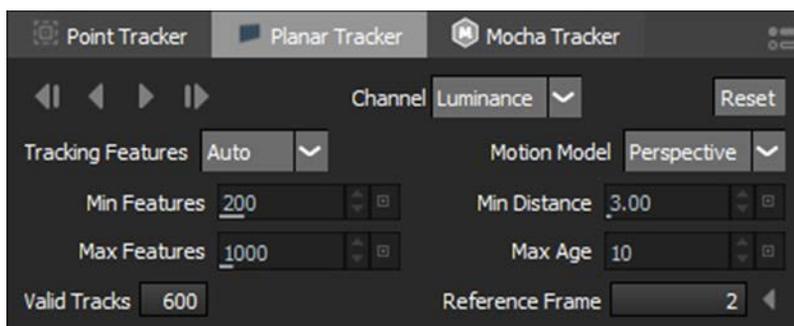
The Roto node is where the Tracker tool is located.

- 2 **Go to the frame where you want to start tracking.**
- 3 **Set the View to Foreground for the fastest speed when tracking. In the Foreground view, no processing occurs and therefore it is faster than View > Output.**

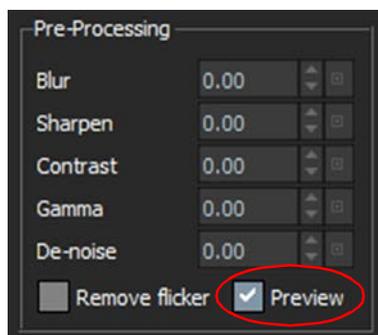
- 4 Create a shape around the object that you would like to track and make sure that there is some detail inside of the shape. It does not have to be exact and it is best to leave a little extra room around the object. In addition, you can use more than one shape as long as they are on the same geometric plane. See the [Roto](#) tutorial for more information
- 5 Choose the Tracker (Shift-T) in the Toolbar.



- 6 In the Tracker tab located at the bottom of the screen, select either the Planar Tracker or Mocha Tracker tab.

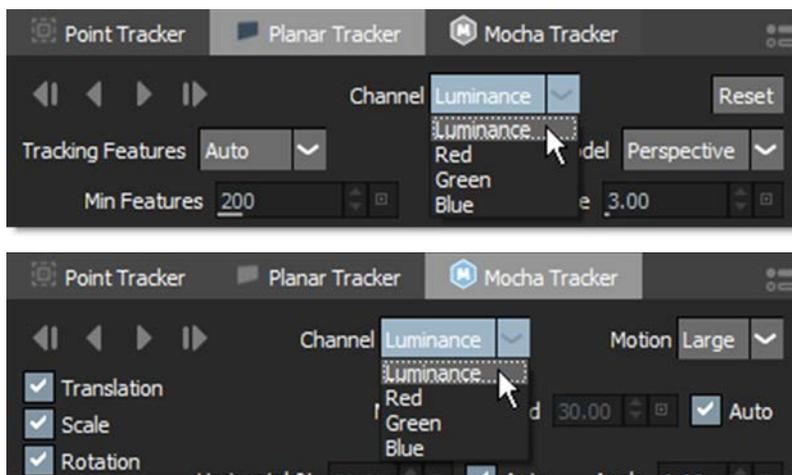


- 7 Enable Preview in Pre-Processing.



The image in the Viewer becomes black and white and displays the color space that you will track in.

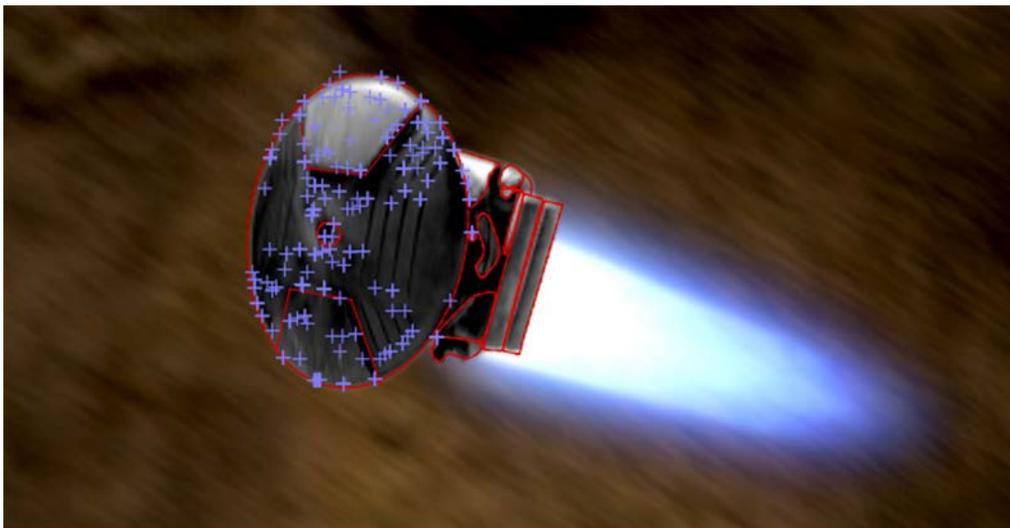
- 8 Select the color space to track with in the Channel pop-up menu.



Pick the color space that displays the best contrast in the object you are tracking.

- 9 Disable Preview in Pre-Processing.
- 10 Select the tracking shape you created in the Object List.

- 11 Hit either the forward or backward track button depending on which direction you are tracking.



Both the Planar and Mocha trackers require a selected layer with at least one shape in it to drive the tracker.

**Note:** If shapes are selected and not in a layer, clicking the Track Forward/Backward buttons will create a new layer, make it active and begin tracking.

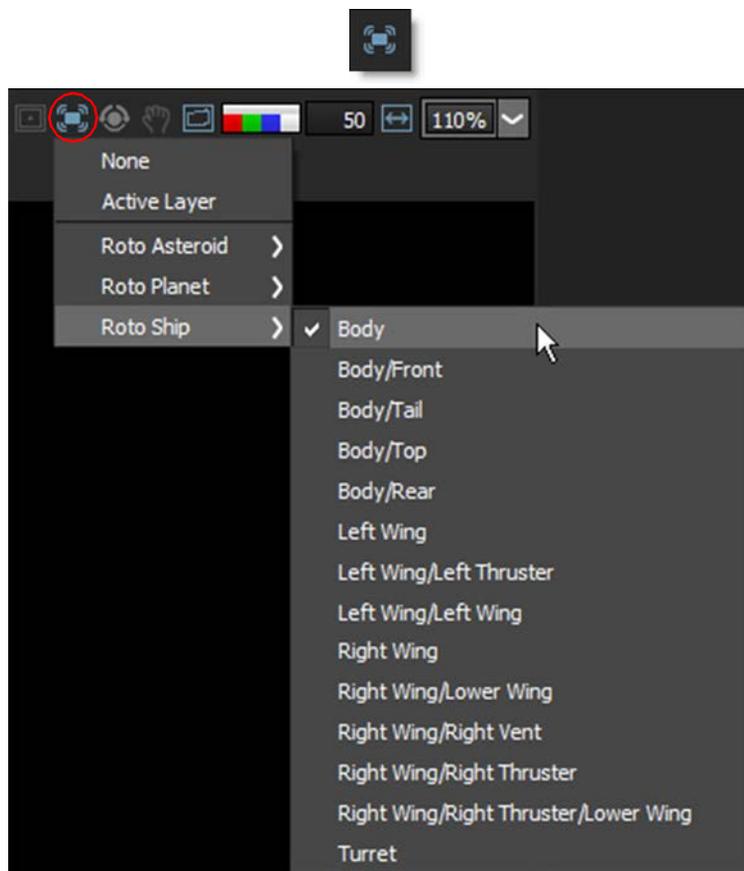
If shapes are selected in an unselected layer, clicking the Track Forward/Backward buttons will make the layer active and begin tracking.

- 12 When the tracking is done, that's it, you're done.

The tracking data is automatically applied to the selected layer.

- 13 After tracking, if you are not happy with the results, try the different techniques listed in [Planar Tracking Tips and Tricks](#) and [Mocha Tracker Tips and Tricks](#).

- 14** If you want to use Stabilization, click the Stabilize icon above the Viewer and choose either the Active Layer or a layer from the list.



The Viewer is now stabilized based on the selected layer's tracking data.

- 15** Make shape adjustments and keyframe it as necessary using the Reshape and Transform tools.
- 16** When shape editing is complete, click on the Stabilize icon (if it was activated) and select None to turn it off.



The Viewer is returned to its normal state.

## Exclude Areas While Planar Tracking

In some cases, there are parts of an image that can interfere with the effectiveness of the Planar or Mocha trackers. To handle this, you can create subtractive shapes to exclude those areas from tracking.

### Exclude Shape - To Be Tracked

When the exclude shape should be tracked by the Planar or Mocha trackers, create a subtractive shape above the primary tracking shape.

- 1 Create a shape around the object that you would like to track.**
- 2 Create a shape around the area that you would like to exclude from the tracking process. Set the shape's Blend mode to Subtract.**
- 3 Place the subtractive shape above the primary tracking shape.**
- 4 Select both shapes.**
- 5 Hit either the Track Forward or Backward button depending on which direction you are tracking.**



**Note:** When shapes are selected and not in a layer, clicking the Track Forward/Backward buttons will create a new layer, make it active and begin tracking.

Now the area within the subtract shape is not analyzed by the Planar or Mocha trackers.

### Exclude Shape - No Tracking

When the exclude shape should not be tracked by the Planar or Mocha trackers, create a subtractive shape above the layer to be tracked.

- 1 Create a shape around the object that you would like to track and place it in a layer.**
- 2 Create a shape around the area that you would like to exclude from the tracking process. Set the shape's Blend mode to Subtract.**
- 3 Place the subtractive shape above the layer containing the primary tracking shape.**

- 4 **Select the layer you are tracking and then add the subtract shape to the selection by using Ctrl/Cmd-click.**

**Note:** The same method used for shapes to exclude areas while tracking can be used for layers.

- 5 **Hit either the Track Forward or Backward button depending on which direction you are tracking.**



Now the area within the subtract shape is not analyzed by the Planar or Mocha trackers.

## Offset Planar Tracking Using Layers

There are times when the object you are planar tracking becomes obscured, and in these instances, you can use a layer to compensate for the obscured object.



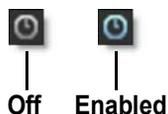
- 1 Track an object using either the Planar Tracker or the Mocha Tracker.
- 2 When the object you are tracking becomes obscured or the track fails, hit the Cancel button in the Tracker Progress window.
- 3 Back up to the last properly tracked frame.
- 4 Select the Timeline tab at the bottom left of the screen.
- 5 After this point in the Timeline, delete any Transform:Matrix keyframes for the tracked layer.



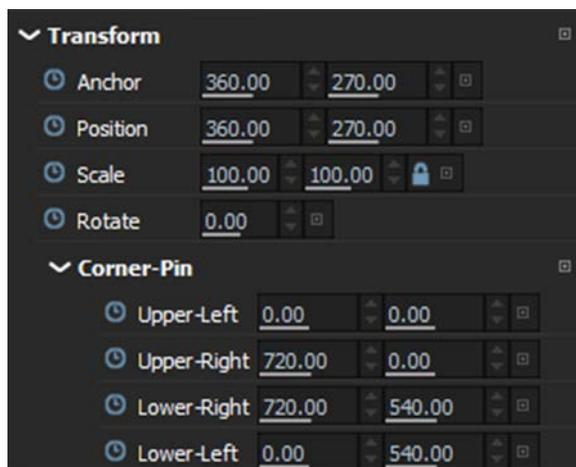
- 6 Click on Transform (T) in the Toolbar.



- 7** Set Transform keyframes for the selected layer at the last properly tracked frame by enabling the Animate icon for the layer parameters that you will be adjusting.



- 8** Move the Timebar forward to where the object you are tracking is no longer obscured and animate the layer parameters so that your shape matches the object you are tracking.



The manual keyframes you set take care of the animation of the object while the object was obscured.

- 9** Choose the Tracker (Shift-T) in the Toolbar.



- 10** If you are using the Planar Tracker, press the Reset button to reset the track points to account for the new location. This sets a new Reference point.
- 11** Hit either the forward or backward track button depending on which direction you are tracking.



## Smoothing Planar Tracked Layers

Smoothing planar tracked layers removes inaccuracies in the tracking data.

**1 Select a layer which has been planar tracked.**

Once selected, the layer displays tracking paths on the four corners and in the center of the frame.

**2 Zoom into one of tracking paths on a corner of the image.**



Viewing the path while adjusting the Smooth slider will provide visual feedback.

**3 In the Tracker tab, choose Smooth and adjust the slider when it pops-up.**



The planar tracked layer is smoothed.



## Group Tracking

Multiple layers containing non-overlapping shapes can be tracked as separate planar surfaces.

- 1 Select multiple layers that contain non-overlapping shapes.



- 2 Track using the Planar Tracker.

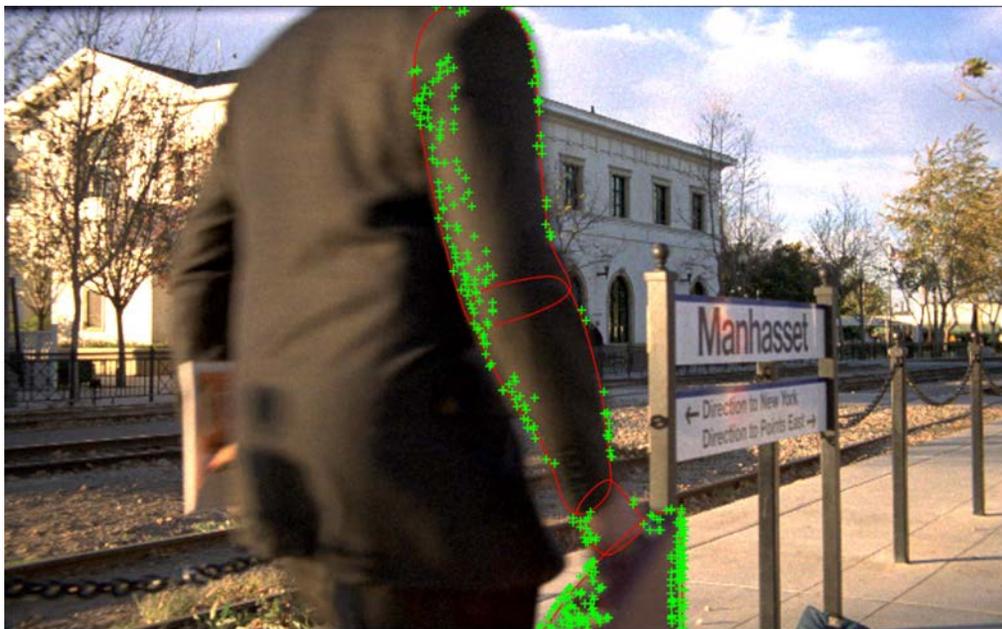
Each layer is tracked as a separate planar surface.

## Part Tracking

Part Tracking uses multiple layers that contain overlapping shapes to aid in tracking non-planar surfaces.

### 1 Select multiple layers that contain overlapping shapes.

Make sure there is a good overlap between the shapes.



### 2 Track using the Planar Tracker.

The overlapping shapes share coarse motion, but have individual motion at the fine scale. This is helpful when tracking non-planar surfaces.

## Planar Tracking Tips and Tricks

If you have trouble tracking a shot using the Planar Trackers, here are some tips and tricks.

### General Tips and Tricks

#### Scrub Your Timeline

When starting a track, go through your footage a few times to see what your best options are for tracking. You will save yourself a lot of time by making note of obstructions and possible problem areas in advance.

#### Change The Tracking Features

By default, Tracking Features is set to Auto which tracks corners, edges and ridges simultaneously and then automatically selects the best result. Changing from Auto to Corners, Edges or Ridges may yield a better result.

#### Switch The Motion Model

Perspective is the default motion model, but Affine (tracks translation, rotation, scale, and skew) or Translation (tracks the XY offset) may better choices for your clip. In general, use Perspective for tracking larger shapes, Affine for medium shapes and Translation for small shapes.

#### Use Edges

When tracking surfaces, you will usually get a much better track if you include the edges and not just the interior of an object. This is because the Planar Trackers can define the difference between the background and the foreground and lock on better.

#### Track From The Largest, Clearest Point

In order for Planar Trackers to keep the best possible track, it is usually best to scrub through the timeline and find the largest and clearest area to begin tracking from, draw your shape there, then use backwards and forward tracking from that point.

For example, if you have a shot of a sign coming toward you down a freeway, it is usually better to start at the end of the clip where the sign is largest, draw your shape and track backwards, rather than start from the beginning of the clip.

## **A Planar Surface Does Not Necessarily Have To Be Flat**

We have a Planar Tracker which specifically tracks planes of motion, but this is not limited to tables, walls and other flat objects. Faces can be tracked very successfully around the eyes and bridge of the nose. Rocky ground, rumpled cushions, clumps of bushes, human torsos and curved car bodies are all good candidates. The key is low parallax or no obvious moving depth. When in doubt, try quickly tracking an area to see if it will work, as you can quite often trick the Planar Trackers into thinking something is planar.

## **Draw More Shapes**

Remember you are not limited to one shape in a layer. Use a combination of shapes to add further areas or cut holes in existing areas to maximize your search.

## **Use Shapes Only For Tracking**

You can use shapes for tracking purposes only and once the track is completed, you can hide or delete them.

## **Create Subtract Shapes**

In some cases, there are parts of an image that can interfere with the effectiveness of the Planar or Mocha trackers. To handle this, you can create subtractive shapes in the area you are tracking.

Create a shape to subtract out areas of unwanted motion that may interfere with tracking and keyframe the shape as necessary. Place this shape above the layer that you are tracking and set the shape's Blend mode to Subtract. Select the layer you are tracking and then add the subtract shape to the selection by using **Ctrl/Cmd**-click. Now when you track, the area within the subtract shape will be excluded.

## **Track From Different Points In Time**

Depending on the motion of the object to be tracked, you may get better results if you track from the end to the beginning. You may also track from the middle to the beginning and then from the middle to the end.

## **Use A Different Channel To Track On**

Change the Channel parameter from Luminance to Red, Green or Blue. The Channel parameter determines which image value the tracking algorithm uses.

## Utilize The Pre-Processing Filters

Use the Blur, Sharpen, Contrast, Gamma, De-Noise or Remove Flicker pre-processing parameters.

## Track The Foreground

Set the View to Foreground for the fastest speed when tracking. In the Foreground view, no processing occurs and therefore it is faster than View > Output.

## There Is No Magic Bullet

The Planar Trackers are very flexible trackers and will save a lot of time, but you will eventually run into a piece of footage that just will not track. Large or continuous obstructions, extreme blur, low contrast details and sudden flashes can all cause drift or untrackable situations.

## Mocha Tracker Tips and Tricks

In addition to the Planar Tracker Tips and Tricks previously mentioned, here is an important Mocha Tracker tip.

## When In Doubt, Ramp Up Your Pixels

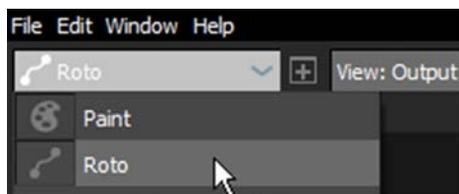
You can quite often get a great result with the default settings, but if you're getting a lot of drift, try setting the Min % Pixels Used value higher. The processing can be slower, but you will usually get a much more solid track.

## Point Tracker

The Point Tracker uses trackers which are placed on distinguishable image features.

### Creating a Tracker

- 1 Select Roto using the Node Selector at the top left of the Viewer.

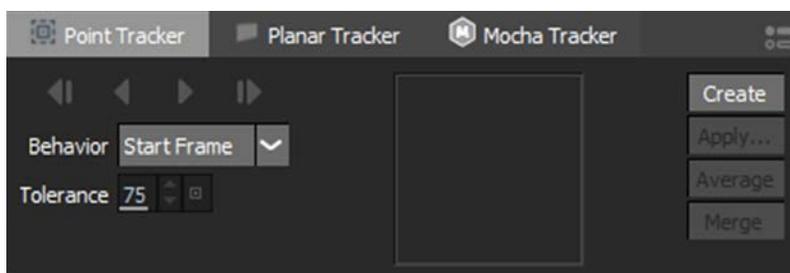


The Roto node is where the Tracker tool is located.

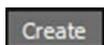
- 2 Select the Tracker (Shift-T) in the Toolbar.



- 3 Go to the frame where you want to start tracking.
- 4 Set the View to Foreground for the fastest speed when tracking. In the Foreground view, no processing occurs and therefore it is faster than View > Output.
- 5 In the Tracker window located at the bottom of the screen, select the Point Tracker tab.



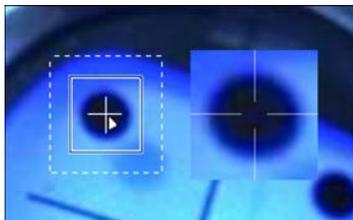
- 6 Press the Create button and a tracker is placed in the center of the image.



or

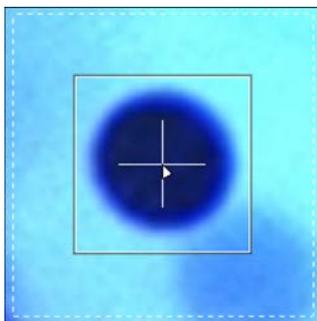
- 7 Alt-click on an open space in the image.

As you pass your cursor over the image with the **Alt** key depressed, a zoomed region to the right of the tracker aids in selecting your Match Area.

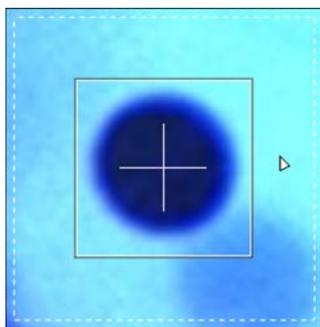


## Moving Tracker Components

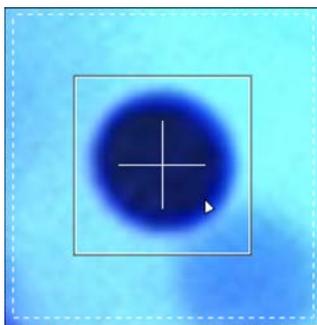
- 1 Clicking and dragging directly on the Track point will move all components of the Tracker: Match Area, Search Region and Track Point simultaneously.



- 2 Clicking and dragging within the area of the Search Region will move only the Search Region.



- 3 Clicking and dragging within the area of the Match Area will move both the Search Region and Match Area simultaneously, leaving the Track Point at its current location. This would be used for Offset Tracking when the original track point becomes obscured.

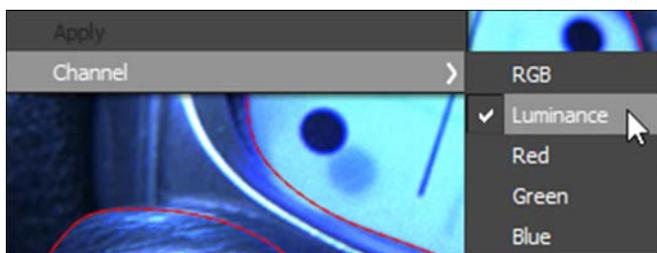


## Scaling Tracker Components

- 1 Clicking and dragging on the corners of the Match Area bounding box scales both the Match Area and Search Region.
- 2 Clicking and dragging on the corners of the Search Region bounding box scales only the Search Region.

## Tracking an Image

- 1 Adjust the size and position of the Match Area and Search Region.
- 2 Right-click on the tracker and select the color space to use in the Channel sub-menu.



- 3 Hit either the forward or backward track button.

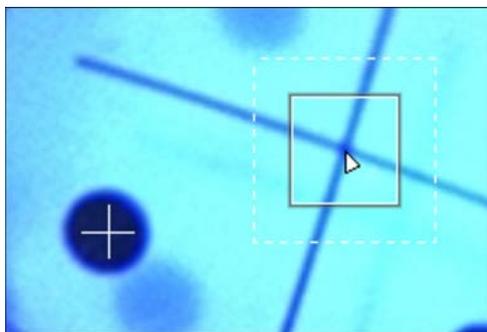


Silhouette will analyze the motion for each frame in the clip.

## Offset Tracking

There are times when your original Match Area gets obscured, and in these instances, you can offset the Match Area and Search Region from the Track Point.

- 1 Create a tracker and track a portion of the clip until the Match Area becomes obscured.
- 2 Hit the Stop button in the Tracker Progress window.
- 3 Back up to the last properly tracked frame.
- 4 Click and drag somewhere within the Match Area and both the Match Area and Search Region will move simultaneously, leaving the Track Point at its current location.



- 5 Click the forward tracking button to continue tracking.

The Track Point follows the same path, but the new Match Area is used to acquire the tracking data.

## Tracking Difficult Shots

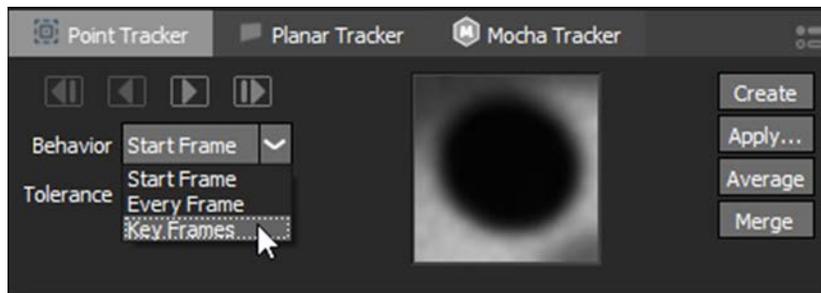
Some clips are difficult to track because of erratic motion or the occlusion of the feature that you are attempting to track. In these cases, you can do a bit of hand tracking using one of two methods:

- By pre-keyframing the tracker at various frames throughout the clip.
- Keyframing a shape and then creating tracker keyframes based on the shape's motion.

### Keyframing the Tracker

- 1 Create a tracker.
- 2 Adjust the tracker to match the object at various frames throughout the clip.

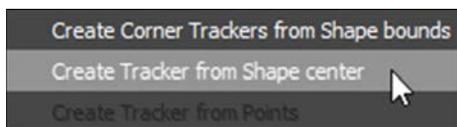
- 3 In the Tracker tab, change the Behavior to Key Frames.



The Tracker Match Area will now use these keyframes as a reference while tracking.

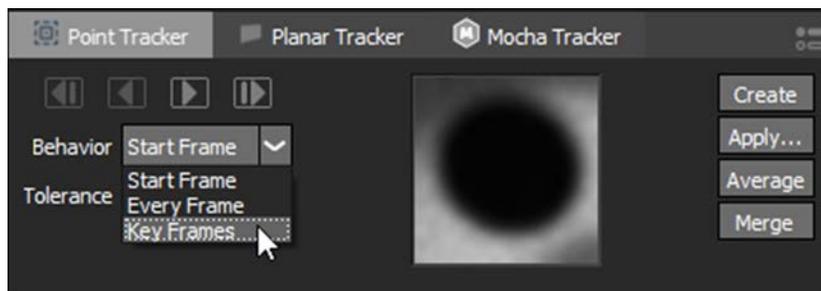
### Create Tracker from Shape Center

- 1 Create a shape around the feature that you would like to track. Go to various frames throughout the clip and adjust the shape to match the feature.
- 2 Select the Tracker tool and right-click on the shape.
- 3 From the pop-up menu, select Create Tracker from Shape Center.



A tracker is automatically created around the center point of the shape and any shape keyframes are automatically applied to the Tracker.

- 4 In the Tracker tab, change the Behavior to Key Frames.



The Tracker Match Area will now use these keyframes as a reference while tracking.

## Modifying Tracking Data

### Averaging Trackers

Averages multiple tracks into a new destination track. A common technique is to track forwards from the first frame to the last, and then create a second track, tracking backwards from the last frame to the first. These two trackers are then averaged together to derive a more accurate track.

- 1 Select more than one tracker.
- 2 In the Tracker tab, choose Average.

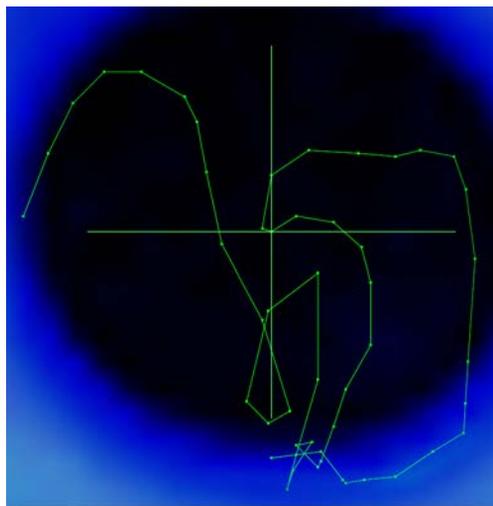


A new averaged tracker is created.

### Smoothing Trackers

Smoothing trackers removes inaccuracies in the tracking data.

- 1 Select a tracker to smooth.
- 2 Zoom into the tracker's path.

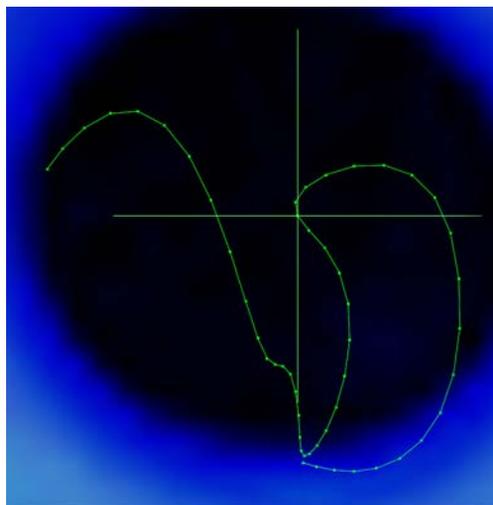


Viewing the path while adjusting the Smooth slider will provide visual feedback.

- 3 In the Tracker tab, choose Smooth and adjust the slider when it pops-up.



The tracker is smoothed.



## Merging Trackers

If you have multiple trackers that cover different frame ranges, they can be merged into one tracker, automatically compensating for the different offsets.

- 1 Select multiple point trackers that cover different frame ranges.

For instance, you may have one tracker that covers frames 1-25, another 25-75 and the last one from 75-100. Ideally, the trackers should overlap in time by at least one keyframe.

- 2 Click the Merge button.



A new tracker is created that covers the frame range encompassed by the three trackers.

## Applying Trackers

### Match Moving and Stabilizing Layers

In general, tracking data should be applied to layers instead of individual shapes. The tracking data is copied into the transform of a layer (containing shapes) allowing you to have separate keyframes for both the layer transformation and for the shapes. This results in far fewer shape keyframes than other methods and is the preferred way of working with clips in motion. The result is a very flexible method for discrete editing of layer and shape transformations.

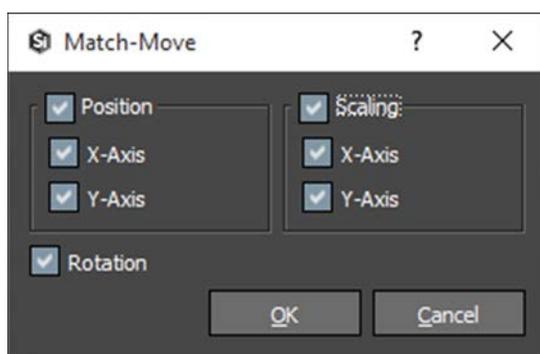
Once applied to a layer, the tracking data can be used in Match Move or Stabilize mode. In Match Move mode, the clip moves as normal and the shape follows along according to the tracking data. In Stabilize mode, the clip is locked in place by stabilizing the Viewer. In either mode, you only need to keyframe the shape when it changes form.

- 1 Select the trackers that you would like to use.**
- 2 Press the Apply button.**



- **With only trackers selected, clicking Apply creates a new layer and the tracking data will be applied to that layer.**
- **If a layer is selected along with the trackers, the tracking data will be applied to the selected layer.**

You have a choice of applying position, scaling and/or rotation. However, scaling and rotation require two trackers.



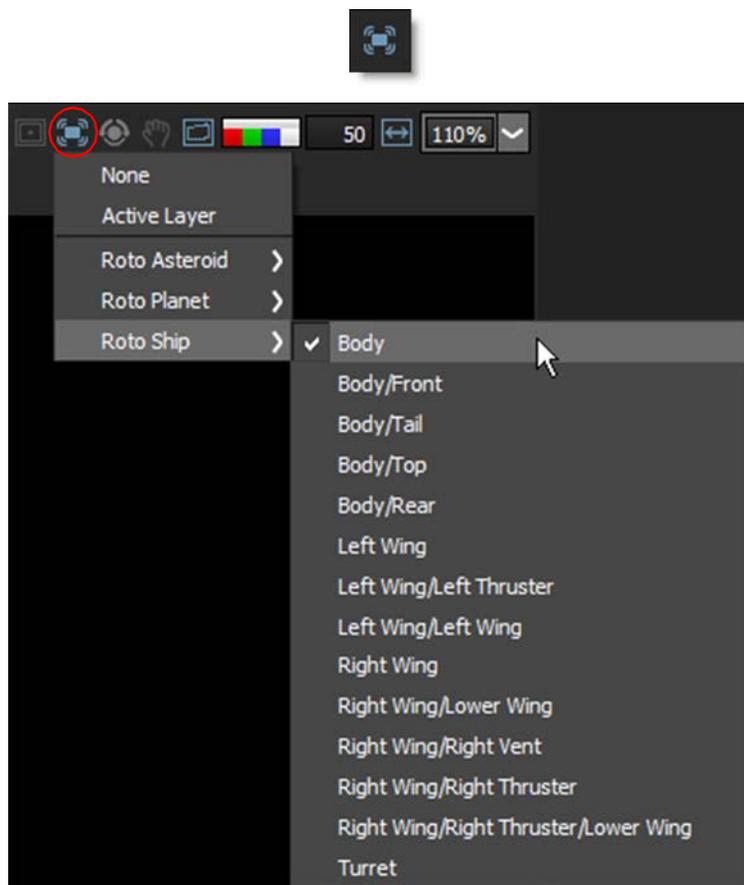
**3 Select Position, Rotation and/or Scaling and click OK.**

The tracking data is applied to the Layer's > Transform > Matrix parameter.

**4 Create a shape inside of the layer.**

If you look at various frames in the clip, you'll see that the shape is match moved to the motion of the image.

**5 If you want to use Stabilization, click the Stabilize icon above the Viewer and choose either the Active Layer or a layer from the list.**



The Viewer is now stabilized based on the selected layer's tracking data.

**6 Make shape adjustments and keyframe it as necessary using the Reshape and Transform tools.**

- 7 When shape editing is complete, click on the Stabilize icon and select None to turn it off.



The Viewer is returned to its normal state.

Each layer can have different tracking data applied to it. Just go to the Tracker tab and apply the motion from other trackers to other layers.

## Four Point Corner-Pin Tracking

Four-point tracking is traditionally used to match the perspective of a square or rectangular shape by tracking its four corners and applying a corner-pin transformation.

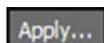
- 1 Create four trackers on the corners of a square or rectangular object and track the motion.
- 2 Create a layer in the Object List using the Add Layer icon.



The new layer is active and you can tell by the check mark icon in the box to the right of the layer name in the Object List.

**Note:** Point tracking data is only applied to the active layer.

- 3 Select the four trackers.
- 4 Press the Apply button.



The corner-pin data from the four trackers is applied to the layer.

- 5 Create a square shape inside of the selected layer. When drawing the shape, it should be placed near the location of the four trackers.

If you look at various frames in the clip, you'll see that the shape's motion is matched to the motion of the image.

## Match Moving Points

Match moving applies the motion of a tracker to individual points on a shape.

**Note:** Match moving individual points results in keyframes being set on every frame of the shape and can make it cumbersome to later edit those points. This functionality has been added to Silhouette as some users prefer to work with this way.

- 1 Select a tracker.**
- 2 Click on a shape to select it and then select a point.**

**Note:** To select points on a shape, you must first select the shape by clicking on the shape outline. Then, **Ctrl/Cmd**-click each point that you would like to select. Also, when a tracker overlaps a point, it will be difficult to select the point while in the Tracker. To select a point that overlaps a tracker, switch to the Reshape tool, select the point and switch back to the Tracker.

- 3 Right-click over a selected point and choose Apply from the pop-up menu.**

The tracking data is applied to the point.

## Point Tracker Tips and Tricks

If you have trouble tracking a shot using the Point Tracker, here are some tips:

- **Set the View to Foreground for the fastest speed when tracking. In the Foreground view, no processing occurs and therefore it is faster than View > Output.**
- **Stop the tracker, go to the bad frame and reposition the Track Point, and hit the tracking button again. You don't need to go back to your start frame.**
- **Lower the Tolerance value, and track again from the beginning, or the frame before the bad frames. The lower the Tolerance, the more forgiving the tracker will be--but also less accurate.**
- **Start over and switch Behavior from Start Frame to Every Frame. This means that instead of trying to compare the tracking region with the first "pure" frame, it will try to match to the previous frame. If you re-track from the middle of a clip, it will consider your new start frame as your reference frame with either setting.**
- **Use the Blur, Sharpen, Contrast, Gamma, De-Noise or Remove Flicker pre-processing parameters.**
- **At any time, you can manually adjust the Track Point by simply grabbing it and putting it where you need to.**
- **Change the Channel parameter from RGB to Luminance, Red, Green or Blue and re-track. The Channel parameter determines which image value the tracking algorithm uses.**
- **A technique you can use to assist with difficult shots is to manually insert tracking keyframes. For example, if you have 100 frames to track, you can put in a keyframe every 5 or 10 frames by repositioning the Tracker. Once your keyframes are manually entered, return to frame 1 and set the Behavior to Key Frames. The tracker searches along the tracker's pre-existing motion path to find matching patterns.**
- **You can use the same technique as in the previous tip, but with the following differences. Create a shape around the feature that you would like to track. Go to various frames throughout the clip and adjust the shape to match the feature. Select the Tracker tool and right-click on the shape. From the pop-up menu, select Create Tracker from Shape Center. A tracker is automatically created around the center point of the shape and any shape keyframes are automatically applied to the tracker. In the Tracker window, change the Behavior to Key Frames. The tracker Match Area will now use these keyframes as a reference while tracking.**

## Importing and Exporting Tracking Data

### Exporting Tracking Data

Trackers can be exported to the After Effects, Autodesk, and Nuke tracker formats. In addition, the tracking data applied to a layer, either by Point Trackers or Planar Trackers, can be exported as a four point corner-pin track.

#### Exporting One to Two Trackers

- 1 Choose the Tracker (Shift-T) in the Roto Toolbar.
- 2 Select the trackers that you want to export.
- 3 Choose Export in the Tracker tab and select the tracker format.
- 4 When the window pops-up, type in a name and click Save.

Currently, you can export to the After Effects, Autodesk, and Nuke tracker formats.

#### Exporting Four Trackers for Corner-Pinning

- 1 Choose the Tracker (Shift-T) in the Roto Toolbar.
- 2 Using the Shift key, select the four trackers that you want to export in a Z pattern: Upper Left, Upper Right, Lower Left and Lower Right.
- 3 Choose Export in the Tracker tab and select the tracker format.
- 4 When the window pops-up, type in a name and click Save.

#### Exporting a Layer as a Four Point Corner-Pin

- 1 Select the layer that you want to export.
- 2 Press the Tracker (Shift-T) in the Toolbar, Choose Export in the Tracker tab and select the tracker format.
- 3 When the window pops-up, type in a name and click Save.

**Note:** When exporting a four point corner-pin track to Autodesk products, it is better to use four trackers instead of the tracking information from a layer.

## Importing Tracking Data

Mocha Pro, After Effects Corner-Pin, Nuke 8 and above, or Simple Format formatted trackers can be imported into Silhouette. If you would like to import trackers from non-supported applications, simply export a Silhouette tracker in Simple Format to see how it should be formatted.

### Silhouette

- 1 Select the Tracker (Shift-T) in the Roto Toolbar.**
- 2 Choose Import in the Tracker tab.**
- 3 Select the Mocha Pro, After Effects Corner Pin, Nuke, Shake or Simple Format tracker file that you would like to import and click Open.**

If you select multiple trackers in the import dialog, more than one tracker can be imported at a time.

- 4 If you used Copy to Clipboard when exporting to Silhouette Corner Pin in Mocha Pro, you can paste the trackers into the Tracker.**

**Note:** With some formats, the imported trackers may not line up with the tracked feature. If so, use MultiFrame mode to move the tracker and it's keyframes into the proper location.

### After Effects

- 1 Double-click on the tracker text file that you exported from Silhouette.**

The value of the Comp Pixel Aspect Ratio line at the top of the exported tracker file must match the Pixel Aspect Ratio in the After Effects Composition settings. Edit the exported tracker file as needed.

- 2 Press Ctrl/Cmd-A to select all and Ctrl/Cmd-C to copy.**
- 3 In After Effects, select a layer in the Timeline and press Ctrl/Cmd-V to paste the Tracker Data.**

**Note:** If you exported a limited work range in Silhouette, go to the start frame of the work range in After Effects before pasting.

- 4 Open the Window > Tracker controls.**
- 5 In the Motion Source pop-up, select the layer where you pasted the tracking data.**
- 6 From the Current Tracker pop-up, select the Tracker that you just pasted. If you only have one tracker, this would be Tracker 1.**
- 7 Change the Track Type from Raw to one of the available options.**

- 8 Click Edit Target and choose the layer that you would like to apply the motion to.
- 9 Hit Apply.

## Flame

- 1 Select the Stabilizer.
- 2 Click on the Imp button below the Track fields and select the tracker file that you saved from Silhouette.

**Note:** When importing a four point corner-pin track in Flame, it is better to use four trackers instead of the tracking information from a layer.

## Nuke

- 1 Choose File > Import Script and select the tracker file that you saved from Silhouette.

# Roto

Rotoscoping or “Roto” for short has become a generic term for drawing shapes to extract, isolate or affect a portion of an image. It is tedious work, but it’s one of the most important parts of the visual effects process. Within Roto, there are all the tools needed to make quick work of any Roto job.

The Roto node is where you create shapes and trackers to be used in Paint for tracking paint strokes as well as holdout mattes for painting.

**Note:** The shapes from the Silhouette Paint plug-in can’t be exported or rendered.

## Tips

Creating usable shape animations can be a bit tricky with the most common problem being edge chatter. Here’s a few tips to help you on your way.

### Analyze the Clip

View your clip to determine the frame that requires the greatest number of points to create the shape. It is easier to draw your shape on the most complex frame as opposed to starting on a simpler frame and adding points later.

### Select a Spline Type

In Silhouette, you can create B-Splines (also known as natural splines), X-Splines, Bézier splines, Circles and Squares.

### Create Shapes with Less Points

Use as many points as needed to create the shape, but avoid using more than is necessary. The fewer the points, the easier it is to successfully animate the shape. Unnecessary shape complexity inevitably leads to inconsistency when editing points.

### Create Multiple Shapes

Create multiple shapes to Roto complex objects. Drawing separate shapes for the major parts of an object give you finer control over motion especially when separate objects intersect with each other.

## Edit the Shape in Groups

Try not to individually move points in a shape unless absolutely necessary. Moving points in groups will maintain consistency and eliminate edge chatter.

## Use the Tracker

Use the tracker to analyze the motion of your clip and then apply that motion to your shapes. This will cut down on the number of keyframes needed.

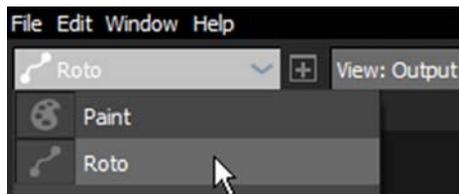
## Keyframe, Keyframe, Keyframe

By editing your shape at various frames in the clip, Silhouette animates the shape in between those keyframes. This saves you work. Make as few keyframes as possible, but as many as needed so the shape properly follows the object that you are rotoing. For instance, on a 80 frame clip, start by adding keyframes at 1, 20 and 40. If more animation is needed, add keyframes at 10 and 30. Get the idea? Creating too many keyframes will cause the shape to jitter or chatter.

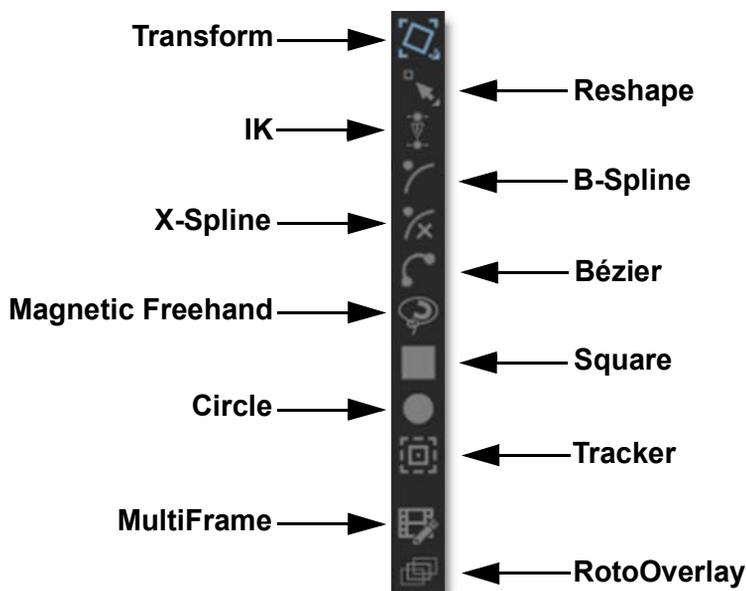
## Quick Start

For the impatient among you, here's a Roto quick start. For all others, Roto features are covered in more detail after this exercise.

- 1 Select Roto using the Node Selector at the top left of the Viewer.



A number of different tools are selectable from the Toolbar to the left of the Viewer.



- 2 View your clip to determine the frame that requires the greatest number of points to create the shape. It is easier to draw your shape on the most complex frame as opposed to starting on a simpler frame and adding points later.
- 3 Select B-Spline (B) from the Toolbar.



- 4 Click on the screen to create a control point.

A control point is created.

- 5 Add as many points as you like.**
- 6 When finished adding points, click the first control point that you added to close the shape.**

Use as many points as needed to create the shape, but avoid using more than is necessary. The fewer the points, the easier it is to successfully animate the shape.

Now that you have a shape, you can use either Reshape or Transform to perform editing functions.

- 7 Select Reshape (R).**



Reshape modifies shapes by adjusting their control points and tangents.

- 8 To move points, select one or more control points and drag the point or points to a new location.**
- 9 To add a new control point, Alt-click on a selected shape.**
- 10 To delete control points, select them and press the Delete key.**
- 11 Go to various frames in your clip and edit the shape using the Reshape tool.**

As the shape is edited on different frames, a keyframe marker is shown in the Timebar to provide a visual display of where there are shape keyframes. The color of the markers is determined by the shape color. If multiple selected shapes have a keyframe on the same frame, the most recently selected object's color has precedence.



Next, instead of modifying the shape's control points, try modifying the entire shape.

- 12 Click on Transform (T) in the Toolbar.**



Transform affects an entire shape or a group of shapes

### 13 Select a shape and use one of the on-screen controls to modify it.

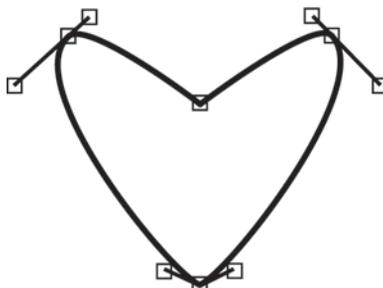
Shortcut	Action
Drag within large center circle	Moves the layer
<b>Shift</b> -drag within large center circle	Constrain layer movement horizontally or vertically
Drag the center square horizontal and vertical halfway points	Scales the layer horizontally or vertically
Drag a center square corner	Proportionally scale the layer
Drag large center circle	Rotate the layer
<b>Ctrl/Cmd</b> -drag large center circle	Rotates the layer with finer control
Drag small center circle	Moves the Anchor point
<b>Q</b>	Activates / Deactivates translation of selected layers
<b>W</b>	Activates / Deactivates rotation of selected layers
<b>E</b>	Activates / Deactivates scaling of selected layers
<b>Q, W, E</b> then <b>Ctrl/Cmd</b>	Translates, Rotates or Scales in finer increments

The **Q**, **W** and **E** keys allow you to quickly translate, rotate or scale selected shapes while using the Transform tool.

### 14 Press the **Q** key to activate translation mode, the **W** key for rotation mode or the **E** Key for Scale mode and click and drag to transform the selected shape. You must press the **Q**, **W** or **E** key, whichever one was selected, a second time to deactivate the mode.

## Bézier

Bézier splines are defined by control points and tangents. The position of the two tangent handles control the amount of a point's curvature.



- 1 Select Bézier (Shift-B) from the Toolbar.



- 2 Click on the image to place the first control point.

The starting control point is created and sets the direction of the shape's path.

- 3 To extend the control point's tangents, drag the cursor while keeping the mouse pressed.

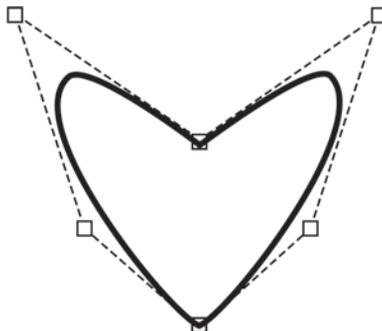
Although you can use the Reshape tool to later change a shape's look after drawing it, you can also use the same Reshape keyboard shortcuts to modify a shape while drawing it. See [Adjusting Bézier Curves](#) for more information on the various ways to change a control point's tangents.

- 4 Click on the screen to add more control points.
- 5 When finished adding points, click the first control point that you added to close the shape.

Use as many points as needed to create the shape, but avoid using more than is necessary. The fewer the points, the easier it is to successfully animate the shape.

## B-Spline

In contrast to Béziers, B-Splines don't use tangents and are created by only using control points. The position of the points, their intensity settings as well as their proximity to each other determine the curvature of the shape.



- 1 Select B-Spline (B) from the Toolbar.



- 2 Click on the screen to create a control point.

A control point is created.

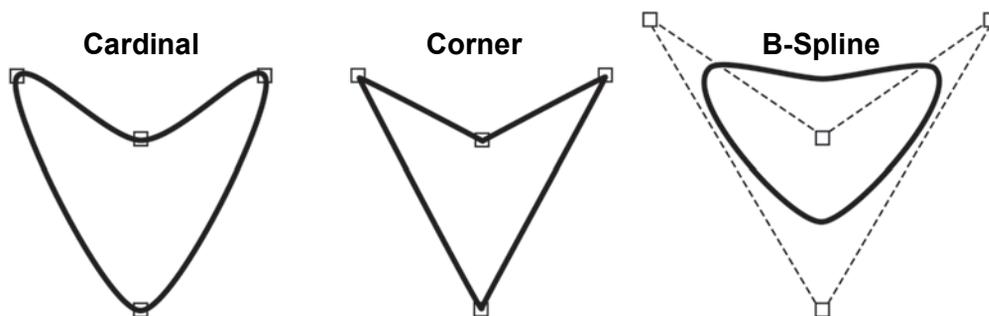
- 3 Add as many points as you like.

- 4 When finished adding points, click the first control point that you added to close the shape.

Use as many points as needed to create the shape, but avoid using more than is necessary. The fewer the points, the easier it is to successfully animate the shape.

## X-Spline

A X-Spline is an intuitive and easily editable spline format whereby its points can be of three different types: Cardinal, Corner or B-Spline.



- 1 Select X-Spline (S) from the Toolbar.



- 2 Click on the screen to create a control point.

A control point is created.

- 3 Add as many points as you like.

- 4 When finished adding points, click the first control point that you added to close the shape.

Use as many points as needed to create the shape, but avoid using more than is necessary. The fewer the points, the easier it is to successfully animate the shape.

## Edge Snapping

You can snap the control points of an X-spline to edges of an object by using the Edge Snapping tool.

- 1 Select some points on an X-Spline.**
- 2 Press the Alt-S key to snap.**

The points snap to the nearest detectable edge. Alternatively, start dragging the points, hold the **Alt-S** key down and they will snap to the nearest detectable edge. In some cases, the points may not snap to where you want them to. If this happens, adjust the points manually.

## Magnetic Freehand

### Creating A Magnetic Shape

Using the Magnetic Freehand tool, you can create a freehand shape with magnetic properties. There are two methods of creating a magnetic shape: Tracing or Strokes.

#### Tracing

Trace the cursor along the edge you want to follow and the shape boundary snaps to the nearest edge.

- 1 Select Magnetic Freehand (Shift-F) from the toolbar.



- 2 Click once near the edge you want to start with.
- 3 Move your cursor along the edge you want to follow.



- 4 Click once any time you want to anchor the currently drawn path along the route and a point is added.
- 5 If there is a tricky section of the edge that the Magnetic Freehand tool doesn't want to line up with, click-hold and drag to draw a freehand shape.

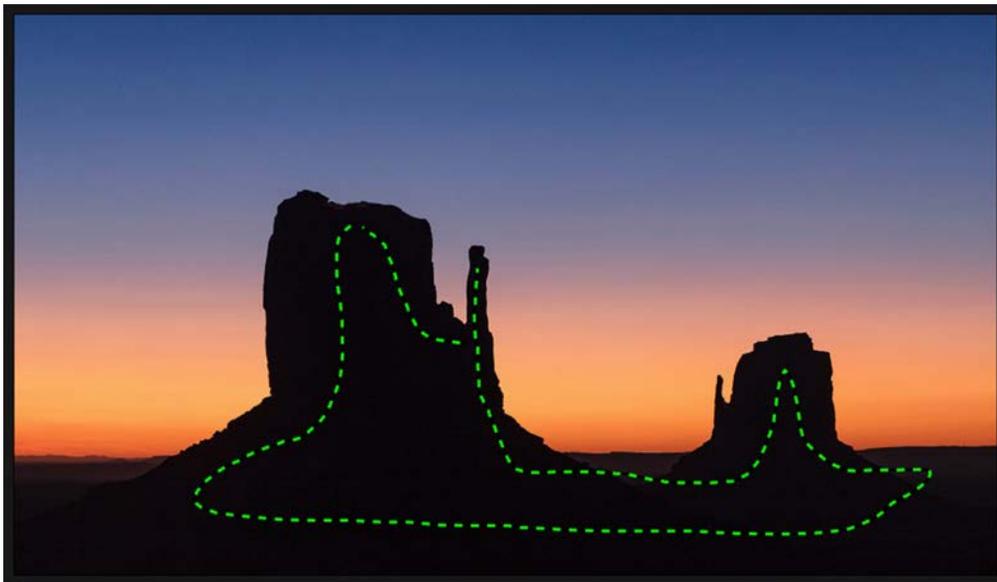
If you want to draw off the edge of the frame, click-hold and drag while tracing to switch to freehand mode.

- 6 To complete the drawn line, click the first control point that you added.**

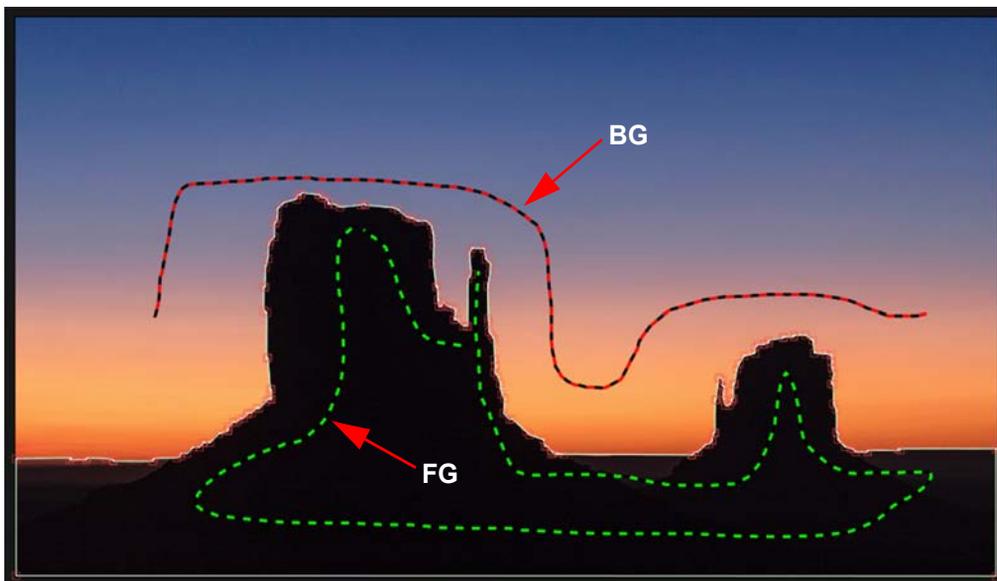
## Strokes

Draw temporary foreground (inside the shape) and background (outside the shape) strokes for the object you want to create a shape around.

- 1 Define foreground areas by Shift-click-dragging.**



## 2 Define background areas by Alt-click-dragging.



As soon as the first background stroke is drawn, an X-Spline is created around the object.



- 3 Add additional foreground and background strokes as needed so that the shape properly surrounds the object.
- 4 Press Esc to clear the foreground and background strokes as well as deselect the current shape. You can now create a new magnetic shape or new foreground/background strokes.

### Creating A Freehand Shape

- 1 Select Magnetic Freehand (Shift-F) from the toolbar.



- 2 Click-hold and drag to create a freehand shape.

- 3 To complete the drawn line, release the mouse on the first control point that you added.

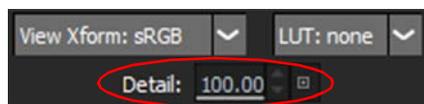
## Adjusting Detail

Magnetic and freehand shapes have a fairly high point count to match the subtle changes in the line. The amount of points can be reduced or increased.

- 1 Select Magnetic Freehand (Shift-F) from the Toolbar.



- 2 Select an X- Spline in the Object List.
- 3 Adjust the Detail slider directly above the Viewer to reduce or increase the number of points.



Adjusting the Detail reduces points for X-Splines created with the Magnetic Freehand tool, while increasing points for normal X-Splines.

## Square

- 1 Select Square (Shift-S) from the Toolbar.



- 2 Do one of the following:
  - Click and drag in the shape of a square.
  - To create a perfect square, hold down the Shift key while clicking and dragging in the shape of a square.
- 3 When you release the mouse button, a square shape appears.

## Circle

- 1 Select Circle (Shift-C) from the Toolbar.



- 2 Do one of the following:
  - Click and drag in the shape of a circle.
  - To create a perfect circle, hold down the Shift key while clicking and dragging in the shape of a circle.
- 3 When you release the mouse button, a circular shape appears.

## Open Shapes

Open shapes are good for rotoscoping strands of hair or thin objects.

- 1 Select either Bézier, B-Spline or X-Spline from the Toolbar.
- 2 Click on the screen to create a control point.

A control point is created.
- 3 Add as many points as you like.
- 4 When finished adding points, select the Reshape tool.

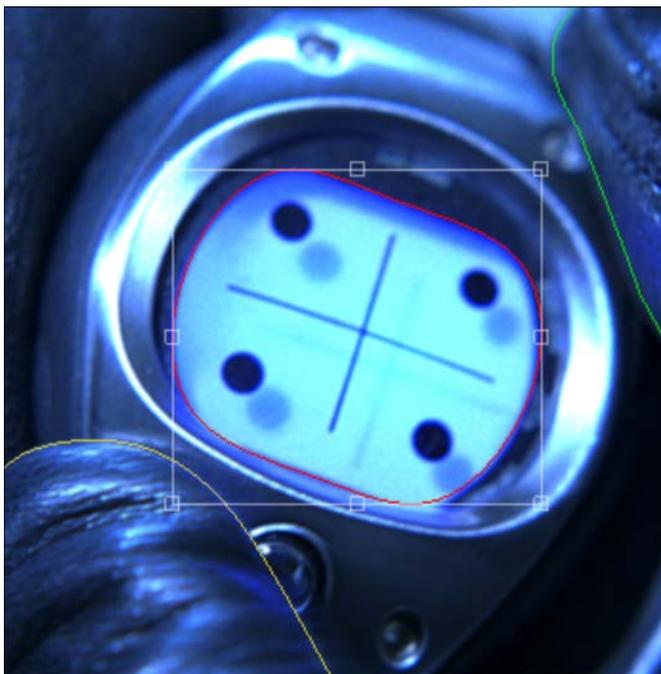
You can also press the **Esc** key to finish the shape.
- 5 Select the open shape and in the Object window, adjust the Stroke Width to set its thickness and choose a Flat or Round Cap Style.

## Transform

Once you draw a shape, there are various ways to modify it. As the object that you are attempting to Roto changes over time, you will need to adjust the shape so that it exactly matches the object. The Transform tool affects an entire shape or a group of shapes.

### Shape Mode

Transform Shape Mode allows you to position, move, scale, rotate, shear or corner-pin a shape or selection of shapes using the on-screen controls.



- 1 Click on Transform (T) in the Toolbar.

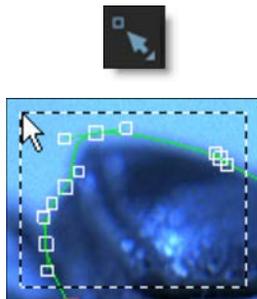


- 2 Select a shape.
- 3 Use one of the on-screen controls to modify the shape. See the tutorials to follow for more detail on using the On-screen controls.

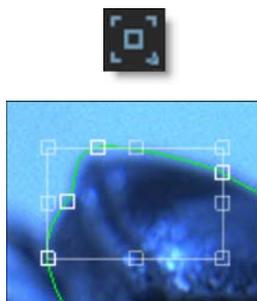
## Points Mode

Transform Points Mode allows you to position, move, scale, rotate, shear or corner-pin a selection of points using the on-screen controls.

- 1 Using Reshape (R), select multiple points on the shape.



- 2 In the Toolbar, click on Transform twice (TT).



A bounding box with on-screen controls appears around the selected points instead of around the entire shape.

- 3 Use one of the on-screen controls to modify the shape. See the tutorials to follow for more detail on using the On-screen controls.

## Moving Shapes

Shapes can be moved horizontally or vertically.

**Note:** The remainder of the Transform tutorials assume that Transform Shape Mode is enabled in the Toolbar.

- 1 Make sure that Transform (T) Shape Mode is enabled.



- 2 Select a shape or series of shapes.

- 3 Drag on the outline of one of the shapes.



or

- 4 Press the Q key to activate translation mode and click and drag to move the shapes.
- 5 You must press the Q key a second time to deactivate translation mode.

### To constrain movement along an axis:

- 1 Select a shape or series of shapes.
- 2 Press the Shift key while dragging the outline of a shape. The movement is constrained by the first direction (horizontal or vertical) that you drag in.

## Nudging Shapes

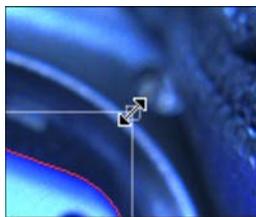
Shapes can be nudged horizontally or vertically using the **Arrow** keys. One press of the **Arrow** key moves the shapes 1 pixel. Using the **Shift** key in conjunction with the **Arrow** keys moves the shapes 10 pixels.

- 1 Select a shape or series of shapes.
- 2 Use the Arrow keys to nudge the shapes.

## Scaling Shapes

Scaling changes the size of the shapes.

- 1 Select a shape or series of shapes.
- 2 Drag any of the points on the shape bounding box.



or

- 3 Press the **E** key to activate scaling mode and click and drag to scale.

**Note:** The position of the cursor when **E** is pressed sets the anchor point for the scaling.

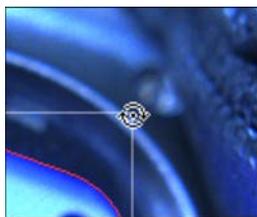
To proportionately scale, hold down the **Shift** key when scaling.

- 4 You must press the **E** key a second time to deactivate scaling mode.

## Rotating Shapes

Rotating changes the angle of the shapes.

- 1 Select a shape or series of shapes.
- 2 Ctrl/Cmd-drag on a shape bounding box corner handle.



or

- 3 Press the **W** key to activate rotation mode and click and drag to rotate.

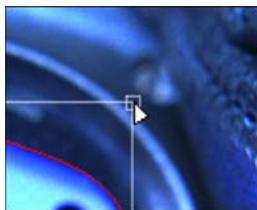
**Note:** The position of the cursor when **W** is pressed sets the anchor point for the rotation.

- 4 You must press the **W** key a second time to deactivate rotation mode.

## Corner-Pinning Shapes

The corner points of a shape's bounding box can be corner-pinned. For instance, you could fit the corners of a shape into the corners of a billboard.

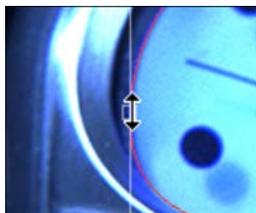
- 1 Select a shape.
- 2 Alt-drag the corners of the shape's bounding box.



## Shearing Shapes

Shapes can be sheared resulting in the shape being skewed horizontally or vertically.

- 1 Select a shape.
- 2 Ctrl/Cmd-drag on the midpoints of a shape bounding box on either the horizontal or vertical axis.



## Anchor Point

A shape rotates around its center point, but scales from the opposite handle. Moving the anchor point changes the center of rotation and scaling when using the on-screen controls.

- 1 Press the **.** (period key).

The Anchor Point is displayed on the screen.



- 2 Click and drag the Anchor Point to the desired location.
- 3 Select your shape and then rotate or scale it.

Notice how the shape rotates and scales around the Anchor Point.

**Note:** If more than one shape is selected, they will both rotate and scale around the Anchor Point.

## Copying and Pasting Shapes

Shapes can be cut(**Ctrl/Cmd-X**), copied(**Ctrl/Cmd-C**) and pasted(**Ctrl/Cmd-V**).

## Deleting Shapes

A shape or selection of shapes can be easily deleted using none other than the **Delete** key.

- 1 Select a shape or set of shapes.**
- 2 Hit the Delete key.**

## Reshape

The Reshape (R) tool modifies shapes by adjusting their control points and tangents.

### Selecting Control Points

- 1 Select Reshape (R) from the Toolbar.



- 2 Select a shape.
- 3 Click on a single point to select it, Shift-click to add to the selection or Ctrl/Cmd-click to toggle the point selection.

### Rectangular Selection

Control points can be selected by drawing a rectangular selection. This is the default behavior.

- 4 Click and drag a rectangle over multiple control points.

A rectangular selection is created.

**Note:** A Shape > Freehand Point Selection preference controls whether freehand selection is used by default. Pressing **Ctrl/Cmd** and dragging uses the non-default method of selection. See the [Shape Preferences](#) for more information.

### Freehand Selection

Control points can be selected by drawing a freehand polygon.

- 5 Ctrl/Cmd-drag in the Viewer to begin the selection. Once the selection is started, release Ctrl/Cmd and complete the selection.

A freehand selection is created.

### Adding Control Points

Adding control points assists in tracing more detailed objects.

- 1 Select a shape.
- 2 Alt-click on a selected shape to add a new control point.

Don't click on an existing control point because it will move it instead.

### Deleting Control Points

- 1 Select the control points and press the Delete key.

or

- 2 Right-click on a control point and select Delete from the Reshape pop-up menu.

## Moving Control Points

- 1 Select one or more control points.
- 2 Drag the point or points to a new location.

## Nudging Points

Points can be nudged using the **Arrow** keys. One press of the **Arrow** key moves the points 1 pixel. Using the **Shift** key in conjunction with the **Arrow** keys moves the points 10 pixels.

- 1 Select a point or series of points.
- 2 Use the Arrow keys to nudge the points.

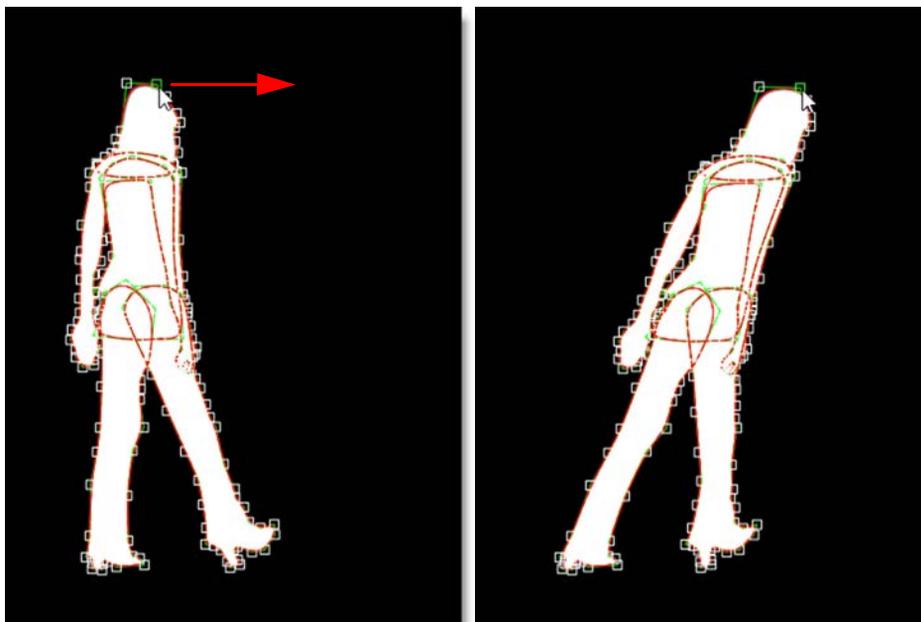
## Magnet Mode

- 1 In the Toolbar, click on Reshape to cycle between Normal and Magnet mode.



- 2 Select a series of points.
- 3 Drag one of the selected points.

Points near the cursor move more than points farther away.



## Numbering Points

All points or a selection of points can be numbered.

### Numbering All Points

- 1** Go to **File > Preferences > Shape on Windows and Linux or Silhouette > Preferences > Shape on Mac.**
- 2** Set the **Number Points** preference to **All**.
- 3** Click **OK**.

Numbers are now displayed next to all points.

### Number One Point or a Selection of Points

- 1** Using the **Reshape (R)** tool, select one or more points.
- 2** Right-click on one of the selected control points and select **Tag**.

The points are now tagged for numbering.

- 3** Go to **File > Preferences > Shape on Windows and Linux or Silhouette > Preferences > Shape on Mac.**
- 4** Set the **Number Points** preference to **Tagged**.
- 5** Click **OK**.

Numbers are now only displayed next to tagged points.

## Feather

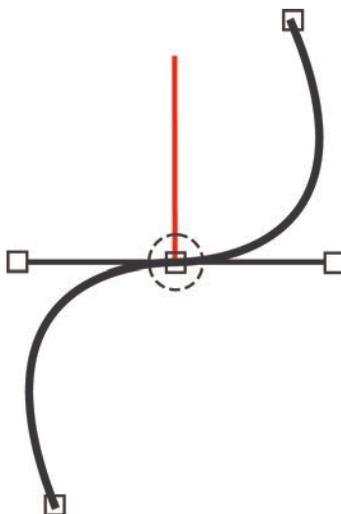
Shape points can be feathered to create variable edged blurs on a point by point basis.

### Closed Shapes

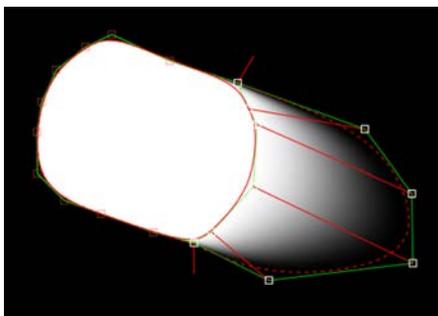
- 1 Select Reshape (R) from the Toolbar.



- 2 Select a shape point and a red, outward feather handle appears. Dragging this handle outward will pull the feather out.



After the initial drag, the outer feather point can be dragged around independently.



Multiple selected points can be dragged simultaneously and by a proportionate amount. To move the shape and feather points simultaneously, press **Shift** while moving the shape point.

**Note:** The display of the feather handles can be hidden using **Alt-F**.

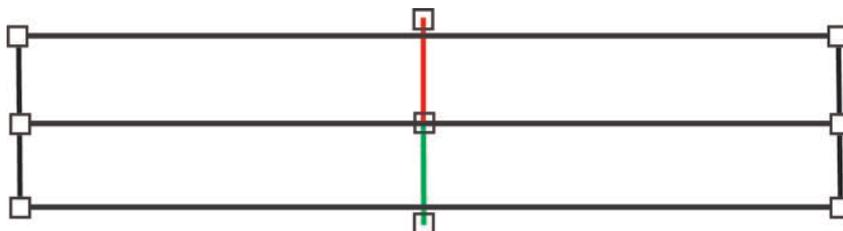
## Open Shapes

- 1 Select Reshape (R) from the Toolbar.

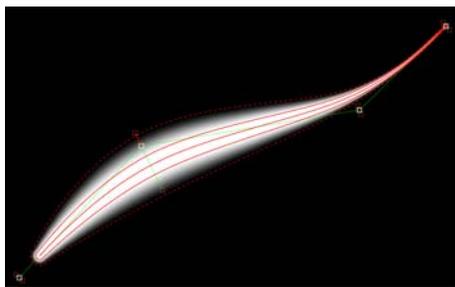


- 2 Select an open shape, adjust the Stroke Width to set its thickness and choose either a flat or round Cap Style in the Object window.

Once you've done this, additional per-point feather handles appear--a red one for the Stroke Width and a green one for the Feather.



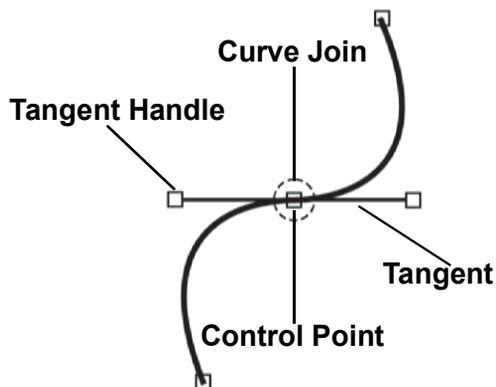
Just drag on the handles to make adjustments.



- 3 Multiple selected points can be dragged simultaneously and by a proportionate amount.

## Adjusting Bézier Curves

The length and direction of a control point's tangents direct the curve through that control point.



Control points have two tangents that can extend from it. The path of the curve through the control point is determined by the length and orientation of the tangents. When you drag one tangent's handle, the adjacent tangent moves as well.

- 1 Select a control point on a Bézier shape.
- 2 Click and drag a tangent handle.

This adjusts the length of one tangent while retaining a fixed angle between the two tangents.



- 3 Ctrl/Cmd-drag a tangent.

This adjusts both tangents simultaneously while retaining a fixed angle between the two tangents.



- 4 Alt-drag a tangent.

Only one tangent is moved which is useful for creating corners.



### 5 Right-click over a control point and select **Linear**, **Corner** or **Cardinal**.

Linear adjusts both tangents one quarter the distance and in the direction of their adjoining control points. Corner collapses both tangents to create a corner point. Cardinal creates a smooth point where the curve passes smoothly through it.

### Extending Short Tangents

Sometimes a control point's tangents are so close together that trying to modify the tangent results in movement of the control point. If this is the case, you can force the tangents to move without affecting the control point.

### 1 Press the **Alt** key while dragging the tangent.

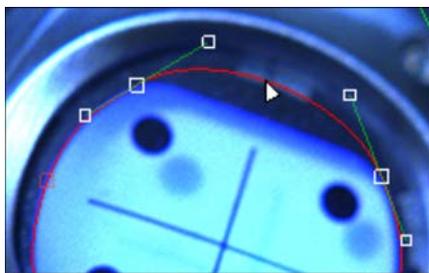
Only the tangent will move, leaving the control point unaffected.

### Moving Curve Segments

Normally, you move control points to adjust the form of a shape, but you can also move the portion of the curve between control points.

### 1 Deselect all control points by clicking somewhere off the shape.

### 2 **Ctrl/Cmd**-drag a Bézier curve segment between control points.



Once you start dragging, the **Ctrl/Cmd** key can be released.

**Note:** The surrounding tangents remain smooth, but if you want to keep adjacent tangents from moving, hold down the **Alt** key while dragging.

## Adjusting B-Splines

B-Splines are created by only using control points and are simple to adjust. The position of the points, their weight settings as well as their proximity to each other determine the curvature of the shape. The weight (amount of pull on a point) decides how sharp or smooth it is. Silhouette employs variable weight intensities on a point by point basis.

- 1 **Select a control point on a B-Spline shape.**
- 2 **Alt-drag the point to the right to create a corner point or Alt-drag to the left to create a smooth point.**

or

- 3 **Alt-click to cycle through the preset weight settings of the point.**

or

- 4 **Right-click over a control point and select Corner or B-Spline.**

**Note:** The **Alt**-click and pop-up menu preset weight settings for Corner and B-Spline can't be animated.

## Adjusting X-Splines

X-Splines are created by using control points and then adjusting their weight to coincide with one of the point types: Cardinal, Polygon or B-Spline. The point type can even be somewhere in between one point type and another.

- 1 **Select a control point on a X-Spline shape.**
- 2 **Alt-drag the point to the right. The tension of the point goes from Cardinal to Corner to B-Spline.**

or

- 3 **Alt-click to cycle through the different point types.**

or

- 4 **Right-click over a control point and select Corner, Cardinal or B-Spline.**

## Converting B-Splines or X-Splines to Bézier Splines

You may convert your B-Splines or X-Splines to Bézier Splines at any time.

- 1 **Select a B-Spline or X-Spline shape.**
- 2 **Select Actions > Edit > Convert to Bézier.**

Once you select Convert to Bézier, a couple of things happen. The visibility of the B-Spline or X-Spline is toggled to off. A new Bézier Spline is created and is named the same as the B-Spline or X-Spline but has an \* at the end of the name.

**Note:** The Bézier conversion of B-Splines that use extreme, variable weight adjustments will not exactly match the original B-Spline. Do not use extreme, variable weight adjustments if you are planning on converting the B-Spline to a Bézier.

## Copying and Pasting Shapes

Selected shapes can be cut(**Ctrl/Cmd-X**), copied(**Ctrl/Cmd-C**) and pasted(**Ctrl/Cmd-V**).

## Breaking Shapes

In the Reshape tool, closed shapes can be opened using the Break option from the control point pop-up menu.

- 1 Select and right-click on a control point.
- 2 Choose Break from the pop-up menu.

The shape opens at the selected control point.

## Closing and Extending Shapes

Shapes can be closed or extended with just a few mouse clicks. It is necessary to use the Reshape tool to perform the following actions.

### Closing Shapes

- 1 Select one of the control points at the end of the shape.
- 2 Alt-click on the other end point to close the shape.

### Extending Shapes

- 1 Select a control point at either end of an open shape.
- 2 Alt-click somewhere off the shape.

## Joining Open Shapes

In the Reshape tool, open shapes can be joined together.

- 1 Select one of the end points of the source shape by clicking on it.
- 2 Make sure both shapes are selected in the Object window.
- 3 Alt-click on one of the end points of the target shape.

The two shapes are now joined together as one.

- 4 Repeat steps 1 and 3 for the two remaining end points to close the shape.**

**Note:** The target shape inherits the attributes of the source shape.

## Combine Shapes

Copies the selected control points from a source shape into a target shape, placing them between two adjacent selected points in the target shape.

- 1 Select one or more points on a source shape.**
- 2 Ctrl/Cmd-click the target shape in the Object List.**
- 3 Select two adjacent points on a target shape.**
- 4 Choose Combine Shapes from the pop-up menu.**

The selected points from the source shape are copied between the two selected points in the target shape.

## Extract Shape

Extracts the selected points of a shape into a new closed shape.

- 1 Select three or more shape control points.**
- 2 Choose Extract Shape from the pop-up menu.**

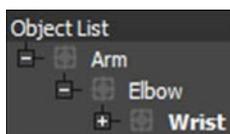
The selected controls points are used to create a new closed shape while removing the points from the original shape.

## IK (Inverse Kinematics)

In computer graphics, inverse kinematics (IK) is a technique that provides automatic movement of objects. It allows elements of an object to be linked, such as the parts of an arm or leg, and causes them to move in a prescribed, realistic manner. IK simplifies the process of rotoscoping jointed, segmented figures by making the motion of each part related to the motion of the linked parts. That way, you simply have to animate the starting and ending joints, and the ones in between will adjust themselves and create more natural looking movement.

- 1 To create an IK chain for an arm, create three layers.**
- 2 Name the layers as follows: Arm, Elbow, Wrist.**
- 3 Move the Elbow layer into the Arm layer.**
- 4 Move the Wrist layer into the Elbow layer.**

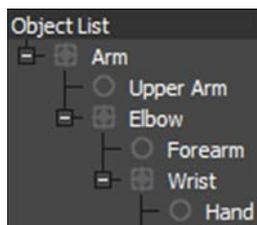
Your layers should look like this:



Create shapes for each layer.

- 5 Select the Arm layer and create a shape for the upper arm.**
- 6 Select the Elbow layer and create a shape for the forearm.**
- 7 Select the Wrist layer and create a shape for the hand.**

The layers and shapes should look like this:

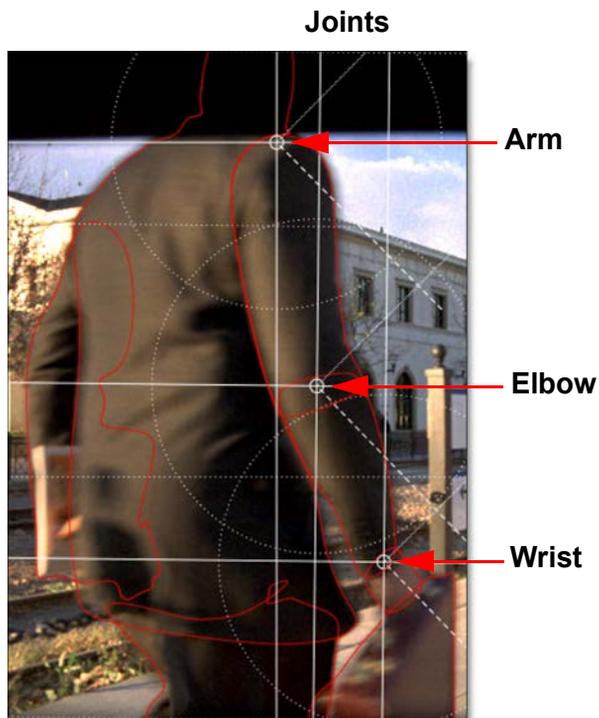


Now that the layers and shape have been setup, the joints need to be placed by positioning the Anchor Point of each layer using the Transform tool.

- 8 Select the Arm layer in the Object List and activate the Transform (T) tool.**

- 9 Move the center Anchor Point on-screen control so that it is positioned at the top of the shoulder.
- 10 Select the Elbow layer and position the Anchor point at the elbow.
- 11 Select the Wrist layer and position the Anchor point at the wrist.

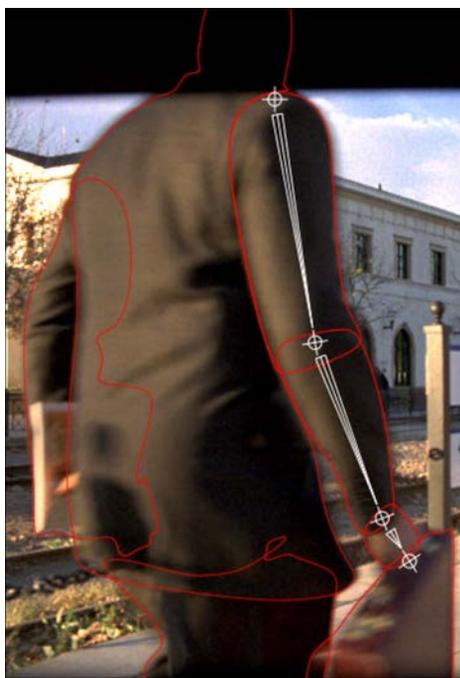
Your image will be different, but the joints should look something like this:



- 12 Select IK (Y) in the Toolbar.



- 13** Select the Upper Arm, Forearm and Wrist shapes and an IK chain is built on the fly that flows up the shape's layer tree to the top-most layer.



Each layer's Anchor Point becomes a joint in the IK chain. The "bones" are just the connections between the layer anchors.

- 14** Click-drag a bone or shape to rotate the shape around the parent's anchor point.

When animated, keyframes are automatically set for each layer's rotation parameter. However, you can explicitly set the layer rotation keyframes by right-clicking on a selected bone and choosing Add Key.

- 15** Click-drag a joint to use IK to rotate all joints up the chain.

- 16** Alt-click-drag a joint to move the joint while attempting to keep other joints in place.

IK greatly simplifies the rotoscoping of humans, animals and all manner of jointed creatures.

**Note:** To quickly jump between the Reshape, Transform, and IK tools while editing a shape, use the shortcut keys: **R** for Reshape, **T** for Transform and **Y** for IK. **R**, **T** and **Y** are very convenient since they are right next to each other.

## MultiFrame

MultiFrame modifies the Transform and Reshape tools to allow you to make adjustments across all previously set keyframes or a selection of keyframes.

- 1 Select MultiFrame (M) in the Toolbar.



A red outline is drawn around the Viewer to let you know that MultiFrame is active.

- 2 Drag the red ends of the MultiFrame range bar at the top of the Timeline to limit the keyframes affected by MultiFrame.



The MultiFrame range is displayed in the status bar while it is being edited.

- 3 Select either the Transform or Reshape tools, make a selection and modify the shape.

Only keyframes defined in the MultiFrame range are adjusted.

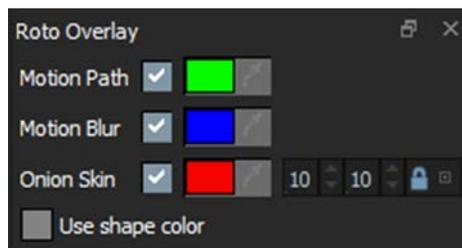
## RotoOverlay

The RotoOverlay tool provides three options to visualize the selected shape's animation and motion blur: Motion Path, Motion Blur and Onion Skin.

- 1 Select RotoOverlay (O) in the Toolbar.



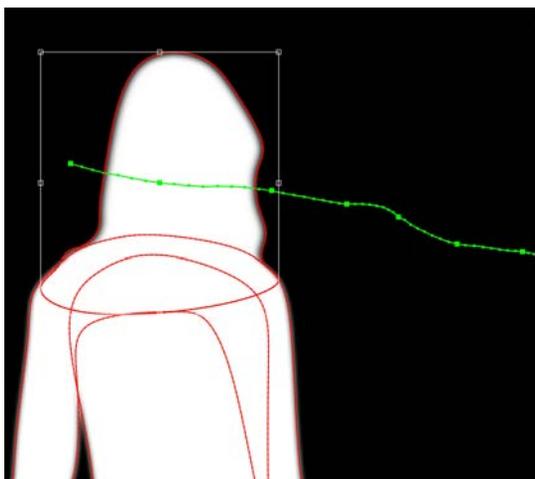
Once selected, a Roto Overlay window opens allowing you to select or deselect various options.



- 2 View each option separately.

- Motion Path

Displays the shape's motion path with visual indicators for frames and keyframes.



- 3 Hold Alt over a motion path marker and the frame number is displayed in the status bar. Click on the marker and the Timebar will jump to that frame.

- **Motion Blur**

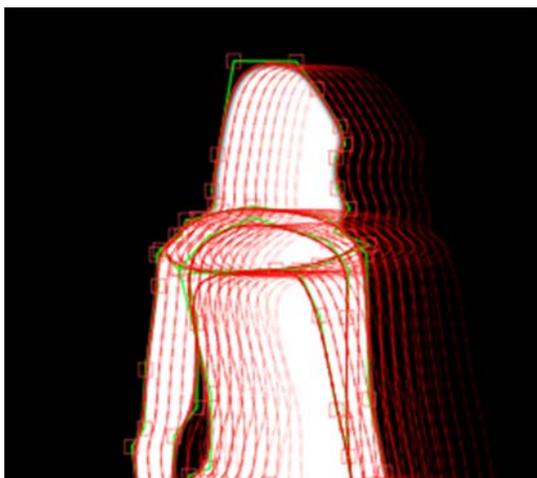
Displays a dashed line to show the width of the motion blur.



**Note:** When the Viewer is set to Foreground, this option allows you to visualize the motion blur without rendering it. This provides a significant speed increase when using many shapes with motion blur.

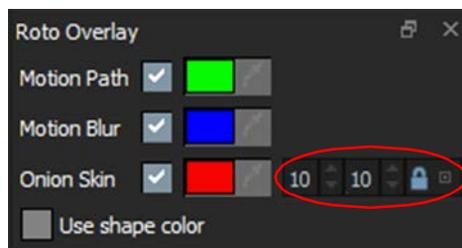
- **Onion Skin**

Shows the shape outline on previous and future frames.



- 4 Hold Alt over an onion skin shape and the frame number is displayed in the status bar. Click on the shape and the Timebar will jump to that frame.

- 5 **Change the Onion Skin Frame Range in the Roto Overlay window. This determines the amount of frames used in the onion skin.**



**Note:** The first numeric field displays the frames before the current frame while the second numeric field displays frames after the current frame. By default, the two fields are ganged together. Click the lock icon to decouple them.

As an alternative to using the pre-defined colors for the Motion Path, Motion Blur and Onion Skin, you can use the default shape colors.

- 6 **Enable Use Shape Color.**

The color of the shape is now used for the selected overlay function.

## Importing Shapes

Silhouette, Mocha Pro, After Effects, Commotion, Elastic Reality and Shake 4.x SSF shapes can all be imported into Silhouette.

- 1 Choose File > Import and select the shape format that you would like to import.**

A file browser opens.

- 2 Select the shape file to import and click OK.**

The shapes are added to the current session.

### Mocha Pro

Mocha Pro shapes and layers are imported into Silhouette using the Silhouette Shapes format. If Copy to Clipboard was used in Mocha Pro instead of saving to a file, the shapes and layers are copied to the system clipboard and can then be pasted into the Silhouette Roto node.

### Commotion

When importing Commotion shapes into Silhouette, the following shape parameters transfer into Silhouette: shape visibility, shape locked state, shape motion blur on/off state. If the shape is invisible in Commotion, it will start out invisible in Silhouette, so it might not look like it was imported unless you have the Object List open.

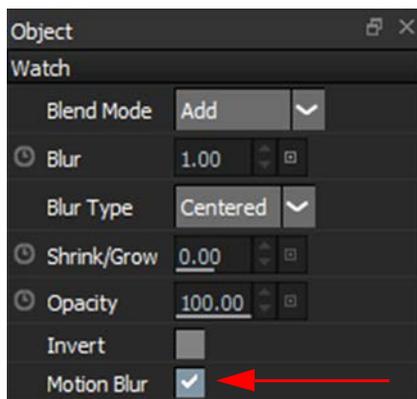
### Shake

Shake 4.x shapes are imported into Silhouette, but attributes such as feathering, color and opacity are ignored.

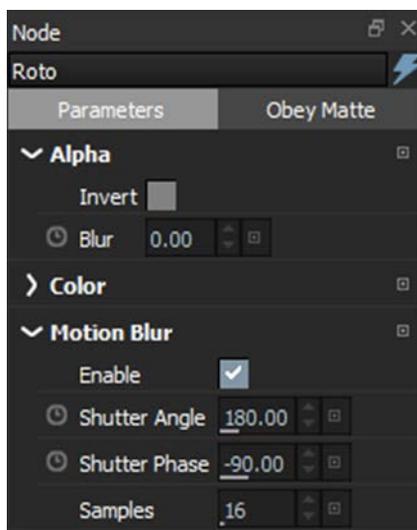
## Motion Blur

Motion blur is the directional blurring of rapidly moving shapes. To use Motion Blur, it must be activated for each individual shape as well as in the Roto node.

- 1 Select one or more shapes and enable Motion Blur in the Object window.



- 2 In the Node parameters, enable Motion Blur and adjust the Shutter Angle, Shutter Phase and Samples as desired.



When working with motion blur, it is best to keep your View set to Foreground. This way editing your shape will be quick and interactive.

- 3 Set your View to Foreground.

When you need to view the motion blurred alpha channel, use **Shift-A**. **Shift-A** toggles the View to Output, superimposes the alpha channel over the image and deactivates the Overlay. Pressing **Shift-A** again returns the Viewer to its previous state.

**4 To view the motion blurred alpha channel, press Shift-A.**

**Note:** Normally, motion blur is calculated going forward, so if there is no shape motion beyond the end of a clip, there won't be motion blur on the last frame. To work around this, add an extra frame or two to the end of the work range in the Timebar, make sure Show Work Range is disabled in the Timeline context menu, and then move the shape's last keyframe to be outside of the Session range.

## Renaming Objects

You can rename a shape, layer or tracker by:

**1 Click on the object once to select it, hit the Enter key, type in the new name and press Enter again.**

or

**2 Double-click the object, type in a new name and hit the Enter key.**

or

**3 Right-click on the object, select Rename and type in a new name.**

## Timebar Keyframes

Colored markers in the shuttle area signify where selected objects have keyframes. These keyframes can be moved to a new position. Objects that display keyframes in the Timebar are shapes, trackers and painted frames. Path keyframes are shown for shapes, position keyframes for trackers and painted frames when in the Paint node.



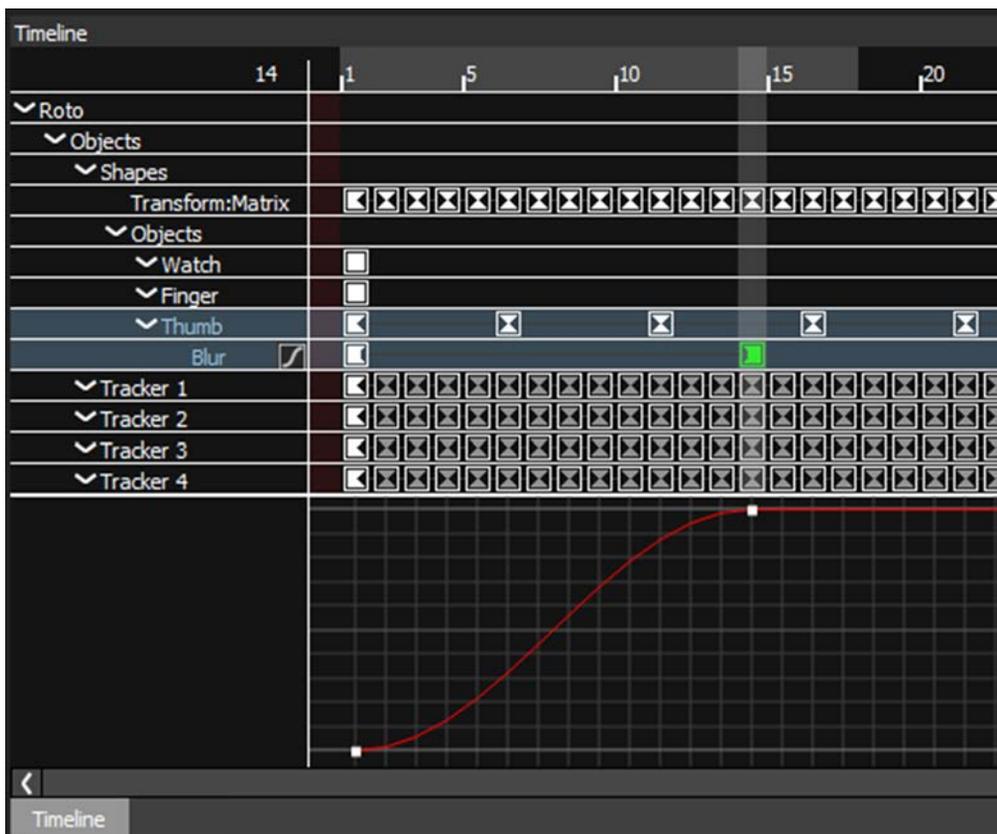
The color of the markers is determined by the object color. If multiple selected objects have a keyframe on the same frame, the most recently selected object's color has precedence.

- 1 Press Shift-Alt and hover over one of the colored markers.**
- 2 When the cursor changes to a double arrow, click and drag the marker to a new location.**



# Timeline

The Timeline is an overall view of all animated parameters. It provides you with the tools necessary to view, edit, move or delete keyframes as well as change their interpolation type using a Curve Editor.



## Zooming the Timeline In or Out

- 1 Use the scroll wheel to zoom the Timeline in and out.

or

- 2 Shift-Middle-mouse drag in the Timeline.

## Panning the Timeline

- 1 Use the Spacebar and click and drag to pan horizontally or vertically in the Timeline.

## Changing the Work Range

The Timeline displays the full session range with the work range displayed using a gray bar at the top of the Timeline.



The work range can quickly be adjusted by:

- 1 **Ctrl/Cmd-drag the ends of the work range bar to change the start and end.**
- 2 **Ctrl/Cmd-drag the work range bar to slide it forward and back while maintaining the duration.**

## Moving One Keyframe

- 1 **Click on a keyframe to select it.**
- 2 **Drag the selected keyframe to its new time.**

## Moving a Selection of Keyframes

- 1 **Click on the starting keyframe to select it.**
- 2 **Shift-click on the ending keyframe.**

A range of keyframes is selected.

- 3 **Click and drag one of the selected keyframes to the new location.**

All selected keyframes move to the new location.

## Adding a Marker

- 1 **Move the Timebar to the desired frame.**
- 2 **Right-click in the Timeline and select Marker > Create/Edit.**
- 3 **Enter the marker text and click OK.**

A light blue marker is displayed at the top of the Timeline.



## Curve Editor

The Curve Editor is a view mode in the Timeline that allows you to work with keyframe animations expressed as curves on a graph. It allows you to visualize the interpolation of the animation.

### 1 Animate a parameter by setting a couple of keyframes.

Once a parameter is animated, the Curve Editor icon appears to the right of the parameter in the Timeline.



### 2 Enable the Curve Editor icon.

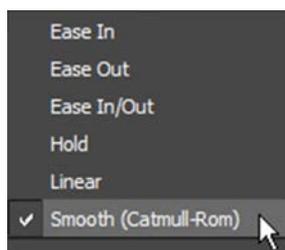


The Curve Editor appears at the bottom of the Timeline.



- 3 Use the + or = keys to zoom in, the - key to zoom out or Space Bar-move mouse to pan the Curve Editor.
- 4 Click and drag a point to move it and Alt-click on the curve to add a new point.
- 5 Right-click on a keyframe in the Timeline or a point in the Curve Editor to bring up the pop-up menu.

The pop-up menu allows you to change the keyframe interpolation.



# Viewer



## Color Management

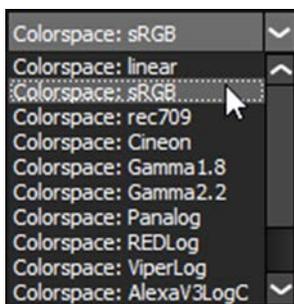
Silhouette uses the OpenColorIO standard originally developed by Sony Pictures Imageworks for its color management. You can load custom color configuration files and custom LUTs, apply colorspace conversions, as well as use other controls for fine tuning.

- 1 Make sure that the Display Options icon is enabled in the Viewer.**



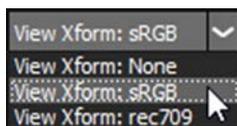
Silhouette automatically tries to determine the colorspace based on the data in the file and other information from the header.

- 2 If not set correctly, change the input colorspace of the current scene using the Colorspace pop-up menu.

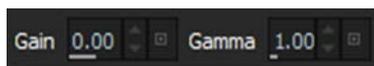


When using Cineon/DPX images with the Color Management > Cineon/DPX Working Space preference set to Linear, the input colorspace should be set to Linear. When the preference is set to Log, the Cineon colorspace should be used.

- 3 If you are using a custom OCIO configuration with multiple Display options, choose the colorspace of the display using the Display pop-up menu.  
**Note:** If there is only one Display option, the Display pop-up menu is hidden.
- 4 Select the colorspace transform to apply to the scene from the View Xform pop-up menu.



- 5 To adjust the brightness of the image in the Viewer, use the Viewer > Display > Gain and Gamma settings.



You can select a custom OpenColorIO (.ocio) configuration file by choosing it in the Color Management > OCIO Configuration preference.

For more information on OpenColorIO, including the OCIO file format, please visit <http://opencolorio.org/>.

## Viewer RGBA Buttons

- 1 Click on the Red, Green, Blue or Alpha buttons to solo that channel as a gray scale image.



If only one component is selected, it is displayed in gray scale. The horizontal white bar above the RGBA buttons quickly toggles the display of the image back to full color mode.

- 2 Select the horizontal white bar above the RGBA buttons to quickly toggle the display of the image back to full color mode.
- 3 Either press the Alpha button (to the right of the blue button) or the A key to cycle the state of the alpha display.

**Note:** To view a shape's alpha channel, you must first set the View to Output before pressing the Alpha button or **A** key.

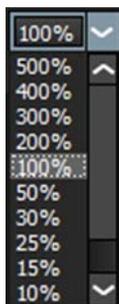
Hitting the Alpha button or **A** key once superimposes the alpha channel over the image. Pressing a second time displays the alpha channel over black. Hitting again shows only the color image.

**Shift-A** activates RGBA mode which does the following: Toggles the View to Output, superimposes the alpha channel over the image and deactivates the Overlay. Pressing **Shift-A** again returns the Viewer to its previous state.

## Viewer Navigation

### Zooming

- 1 Select a value between 25% and 500% in the Zoom pop-up menu.



or

- 2 Use the scroll wheel on your mouse to zoom in and out of the image.

or

- 3 Press Space Bar-Shift and move the mouse up to zoom in or down to zoom out.

or

- 4 Use the + or = keys to zoom in and the - key to zoom out.

### Zoom and Centering Presets

- 1 Press the F keyboard shortcut or select Fit from the zoom pop-up window to display the image as large as possible within the Viewer window.
- 2 Press the H keyboard shortcut or double-click the middle mouse button to set the image to a 100% zoom level and center it in the Viewer.
- 3 Press Ctrl/Cmd-F to center the selected object in the Viewer.

## Viewer Rotation

Rotating the Viewer can facilitate rotoscoping and painting.

- 1 **Select the Rotate icon to enable Viewer rotation mode.**



Once Rotate is enabled, the Adjust Rotation editing control (hand icon) becomes available.

- 2 **Press the Adjust Rotation icon to enable it.**



- 3 **Click and drag in the Viewer to set the angle.**

Once the angle has been set, you will need to disable Adjust Rotation to use the node's tools.

- 4 **Select the Adjust Rotation icon again to disable it.**

## Opening Additional Viewers

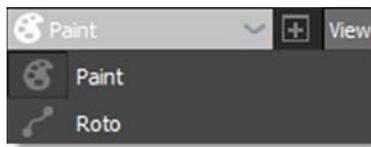
Open additional Viewers that can be set to any node or view.

- 1 At the top left of the Viewer, click the New Viewer icon.



A new viewer opens as a floating window.

- 2 Select the node to view.



The new Viewer has the following controls: Node, View, Update Mode, Channels and Zoom. The remainder of the controls are shared with the main Viewer.

**Note:** Multiple viewers from the same node have the option of being synchronized in terms of zoom and pan using the Use Viewer > Synchronize Viewers preference.

## Optimizing Playback

Silhouette can cache frames into RAM to guarantee real-time playback. When you hit the play button, each frame is cached into RAM. Once the clip is played through once, it will then play in real-time if enough RAM is available. At the bottom right corner of the interface, there is a numeric readout (Cache Display). It displays the length of your clip, the maximum frames that can be cached into RAM, the percentage of RAM currently being used as well as the session's bit depth.



If your clip is longer than the maximum frames that can be cached into RAM, the clip will not play in real-time.

### Preload Frames

#### 1 Play your source clip to cache it into memory.

Once cached, playback is instantaneous since the frames are already loaded. In addition, source frames are also automatically cached in a background thread. The amount of preloaded frames is controlled by a Cache > Preload Frames preference with the default value being 10 frames.

#### 2 Select File > Preferences on Windows and Linux or Silhouette > Preferences on Macintosh.

#### 3 Go to the Cache group.

#### 4 If you'd like, you can change Preload Frames to a higher value.

#### 5 Click Apply.

### Increase Amount of Frames During Playback

There are number of ways to increase the amount of frames that can be played back in real time.

#### 1 Enable the Viewer > ROI (Region of Interest) to work on a sub-region of the image.

- 2** Select **File > Preferences on Windows and Linux** or **Silhouette > Preferences on Mac** and increase the **%Total Physical RAM** parameter in the **Cache preferences** (requires a restart of Silhouette to take effect). Please note that setting the **% Total Physical RAM** too high could cause instability if running other memory intensive programs.
- 3** When in the **Roto** node, change the **View** from **Output** to **Foreground**.
- 4** Shorten the length of the clip by adjusting the **First and Last Frame** in the **Timebar**.

## ROI (Region of Interest)

ROI (Region of Interest) crops the image in the Viewer to a user defined size and can be animated. This is especially useful when you only need to work within a smaller region of a larger image as it will use less memory and process faster. If expanded, the ROI will display overscan pixels which can then be manipulated.

### Using a Smaller ROI for Performance

The ROI can be made smaller than the session size to speed up processing and save memory. This is especially useful when working with larger images.

- 1 Display the ROI controls by clicking the ROI icon above the Viewer.



Once the ROI icon is activated, the ROI controls appear above the Viewer.



- 2 Make sure the Enable button is active.
- 3 Drag one of the corner points to size the ROI.  
**Note:** You can also **Ctrl/Cmd-Shift-drag** a square region in the Viewer to draw a ROI region.
- 4 Move the ROI by clicking and dragging its bounding box.
- 5 Animate the ROI by enabling the Animate icon and adjust the ROI at various frames.



- 6 To avoid moving the ROI by mistake after it has been set, disable the Viewer > ROI icon.



This hides the ROI controls, but it is still active.

**Note:** To temporarily turn off the ROI effect, toggle the Enable icon.



## Using the ROI to Reveal Overscan Pixels

If the source's DOD (Domain of Definition) is larger than the session, the ROI can expand to reveal overscan pixels which can then be manipulated.

- 1 Display the ROI controls by clicking the ROI icon above the Viewer.



Once the ROI icon is activated, the ROI controls appear above the Viewer.



- 2 Make sure the Enable button is active.
- 3 Click the Set ROI to DOD icon in the Viewer.



The ROI will automatically be set to match the size of the source's DOD and will reveal any overscan pixels.

# Keyboard Customization

Keyboard shortcuts can be customized by using a text editor to modify a Python script located in the scripts folder of your Silhouette installation.

## **To modify your Silhouette keyboard shortcuts:**

- 1** Go to the scripts folder of your Silhouette installation.
- 2** For Windows, go to C:\Program Files\SilhouetteFX\Silhouette[version]\resources\scripts.  
or
- 3** For Linux, go to /SilhouetteFX/silhouette[version]/resources/scripts.  
or
- 4** For Macintosh, go to /Applications/Silhouette[version], right-click on *Silhouette* and select Show Package Contents.

A new Browser window opens.

- 5** In the new Browser window, go to Contents/Resources/scripts.

Inside the scripts folder, you will find a *keybinds.py* file. As a precaution, it would be a good idea to make a backup of this file.

- 6** Make a copy of the *keybinds.py* file and rename the copy *keybinds.py.bak*.
- 7** Using a text editor, open the *keybinds.py* file.
- 8** Scroll down and replace the existing shortcuts with those of your choosing.
- 9** Save the file.

Restart Silhouette for the new keyboard shortcuts to be active.



## USER INTERFACE

Silhouette internally is a node based system and is made up of Paint, Roto and Source nodes. The Source is connected to the Roto node and the Roto node to Paint. This allows you to create shapes and trackers in the Roto node to be used in Paint for tracking paint strokes as well as holdout mattes for painting.

You can select either the Paint, Roto, or Source nodes. Once selected, the node's parameters appear in the Node window and the appropriate tools appear in the Toolbar.

## Host Application Plug-in Parameters

### Silhouette Interface

#### Open

Opens the Silhouette user interface.

### Optional Clone Sources

#### Inputs 1-2

Selects optional sources to use as Clone inputs.

For node based hosts, connect sources to the Silhouette node's Input 1-2 inputs. For layer based hosts, select the layers using the Silhouette plug-in's Input 1-2 pop-up menus.

#### Notes

- **Resolve does not allow more than one input for plug-ins that use custom user interfaces. A future Resolve software update will be required to accommodate optional clone sources.**
- **Vegas supports 1 optional clone input.**

### Source Alpha

Controls whether the source alpha is used in Silhouette.

#### Clear Alpha

The source alpha is set to transparent.

## Preserve Alpha

The alpha from the source (the image or layer Silhouette is applied to) is passed to Silhouette.

## Output Alpha

Determines the alpha output mode.

### Brush Mask

Outputs an automatically generated alpha channel where the brush painted.

### Painted Alpha

Outputs strokes painted in the alpha channel.

### Source Alpha

Outputs the source alpha.

## Hold Frame

Holds the currently painted frame for the entire sequence.

## New Project

When the Silhouette interface is opened, a New Project Dialog opens.

**Note:** Silhouette Standalone projects can be opened in Silhouette Paint, but Silhouette Paint projects can't be opened in the Standalone.

### Name

Sets the project name.

### Folder

Sets the folder path.

### Working Depth

#### 8 bit

Sets the bit depth to 8 bits per channel.

#### Float 16

Sets the bit depth to 16 bit floating point. Float 16 will have slightly less precision than Float 32 but will take up much less memory.

#### Float 32

Sets the bit depth to 32 bit floating point. Float 32 will be higher precision than Float 16, but will take up much more memory.

**Note:** In most cases, the Working Depth should match the host application's bit depth.

### Create Project

When a new project is created, a folder is generated using the name of the project and contains the project file as well as paint data, autosave, and backups

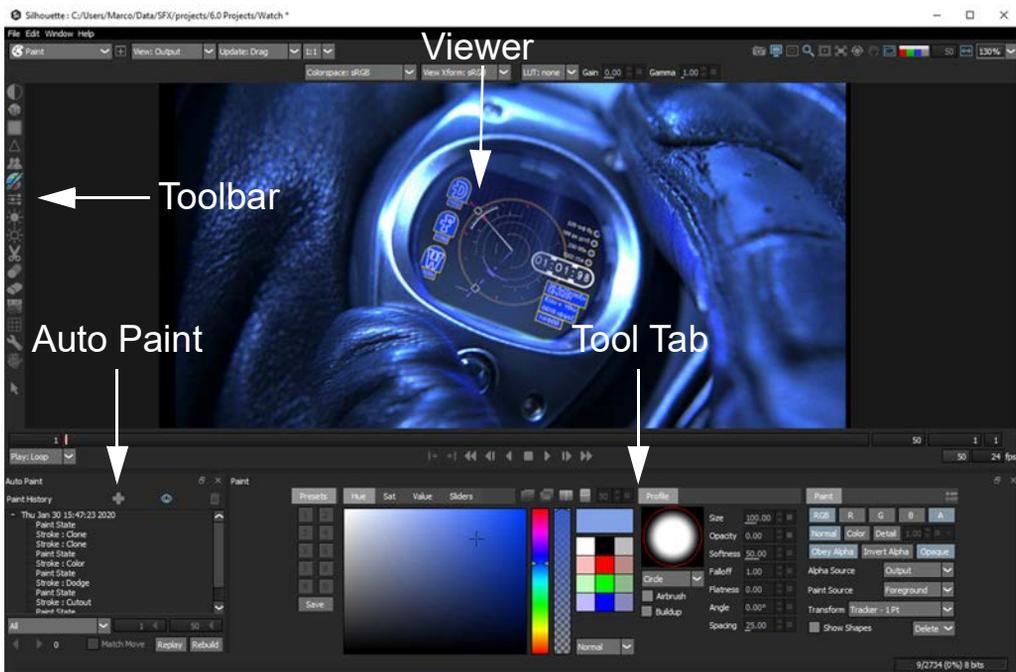
### Open Project

Opens existing projects using a file browser. This allows loading Silhouette Paint plug-in projects created in other host applications as well as Silhouette standalone projects.

**Note:** If loading a Silhouette standalone project, it is best practice to use the Paint Template when creating the standalone session and to not have more than one Paint and Roto node. It goes without saying that the sources need to be hooked up to the same inputs in both the standalone and plug-in.

# Paint Interface

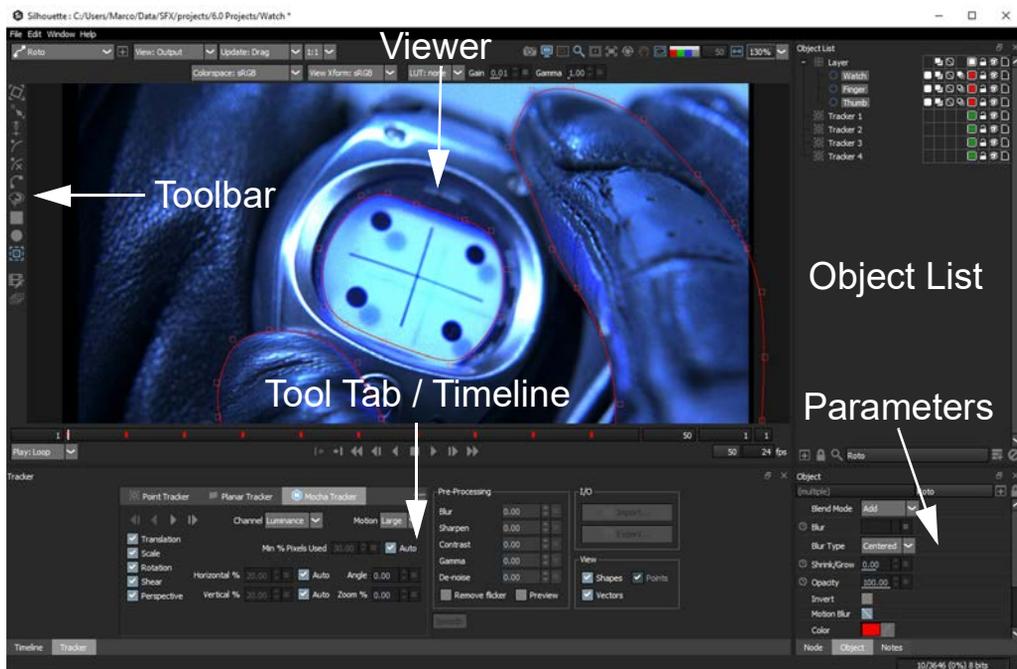
The Paint interface is comprised of Toolbar, Tool Tab, Auto Paint and Viewer windows.



# Roto Interface

The Roto interface is comprised of Toolbar, Tool Tab, Object List, Parameters, Viewer and Timeline windows.

The Roto node is where you create shapes and trackers to be used in Paint for tracking paint strokes as well as holdout mattes for painting.



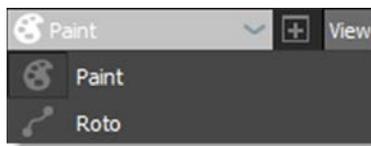
## Viewer

Silhouette uses a Viewer for image editing as well as for clip playback. Some features include viewing individual color channels and the simultaneous display of RGB and alpha channels.



## Node Selector

Selects either the Paint or Roto nodes. Once selected, the node's Toolbar and parameters appear.



**Alt-J** cycles between the Paint and Roto nodes.

## New Viewer

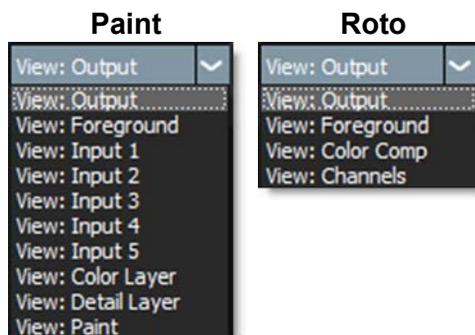
The New Viewer icon opens additional Viewers that can be set to any node or view.



**Note:** Multiple viewers from the same node have the option of being synchronized in terms of zoom and pan using the Use Viewer > Synchronize Viewers preference.

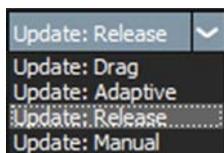
## View

Offers various View options for the selected node. The View choices will depend on the node and what inputs are used.



## Update

Determines when processing takes place. The ! key cycles through the Update modes.



### Drag

Tries to process at the current resolution as fast possible.

### Adaptive

Tries to process as fast possible by first processing a 4:1 proxy and then full resolution.

## Release

Processes once the mouse or pen is released. This the default setting.

## Manual

Silhouette does not process. If you place the cursor within the Viewer window and hit the **Enter** key, Silhouette will manually process any changes.

## Proxy

Sets the viewer resolution. The higher the number, the lower the resolution.



The higher the proxy setting, the more frames you can play.



### 1:1

1:1 keeps the image quality at full resolution.

### 2:1

2:1 lowers the image resolution by 1/2.

### 3:1

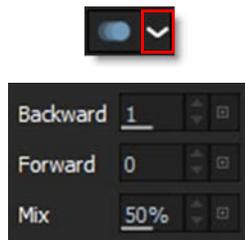
3:1 lowers the image resolution by 1/3.

### 4:1

4:1 lowers the image resolution by 1/4.

## Onion Skin

Onion Skin does a mix, as defined by the Mix value, between the current frame and either previous or later frames. This is useful for creating frame by frame, hand painted animations.



By default, Onion Skin is set up to display a mix to the previous frame.

### Backward

Displays frames before the current frame.

### Forward

Displays frames after the current frame.

### Mix

Sets the Onion Skin mix value.

## Snapshot

Captures the image in the Viewer so that it can be compared with other nodes or Viewer modes using Toggle Snapshot, Vertical Split, and Horizontal Split snapshot modes.



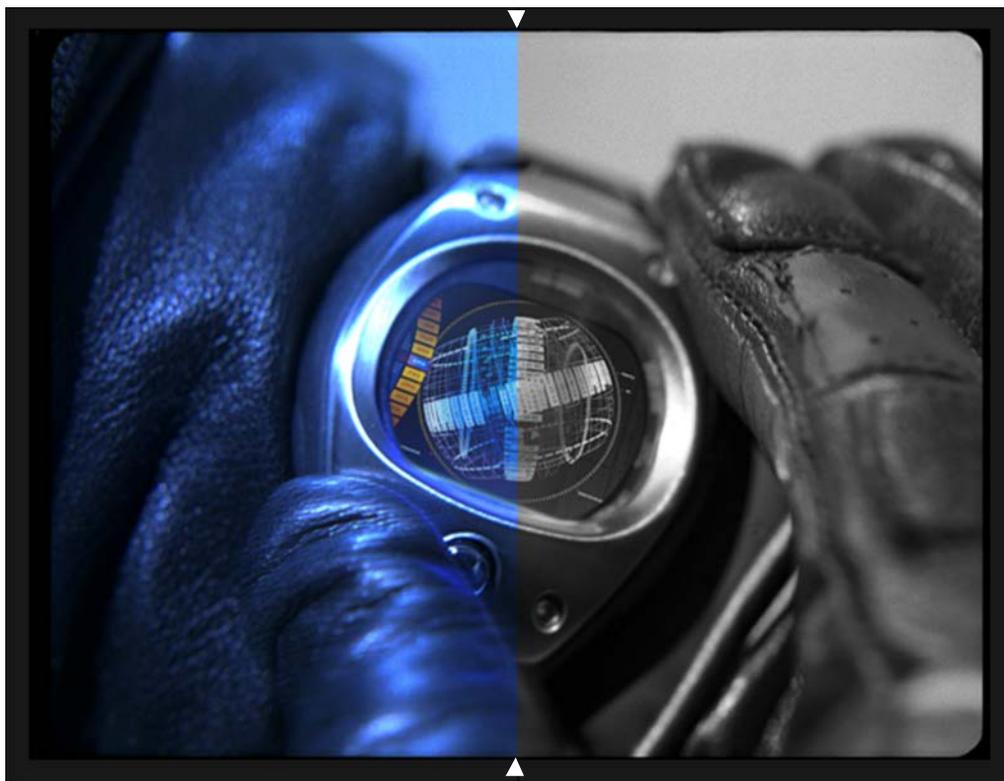
### Toggle Snapshot

Cycles between the snapshot and the current image.



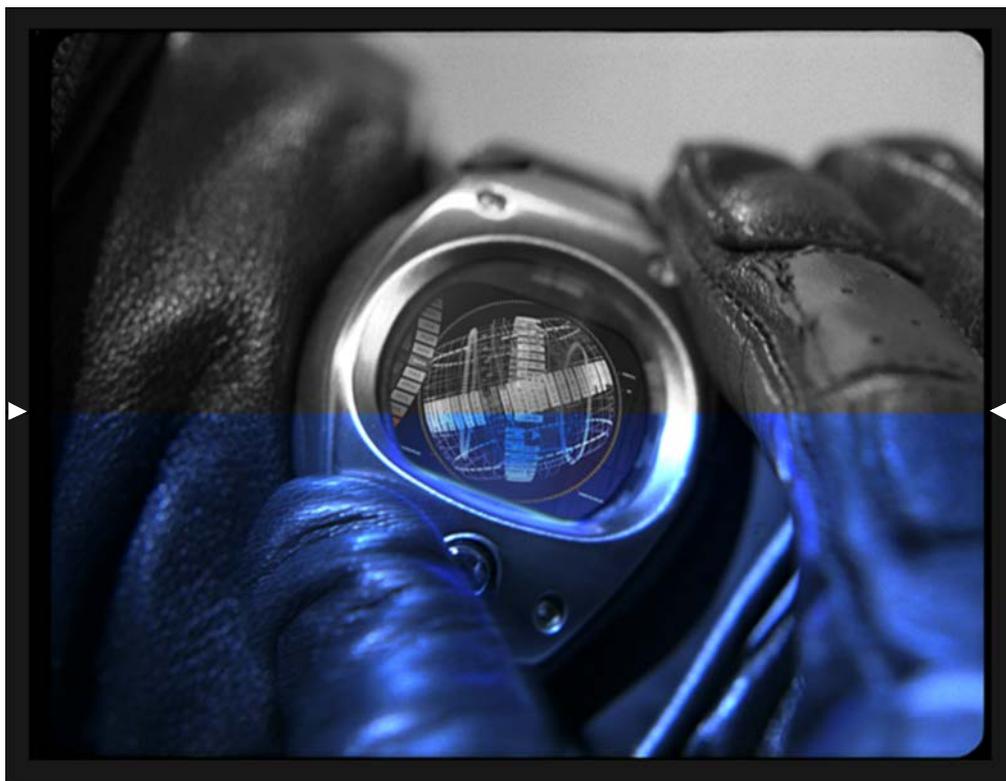
## Vertical Split

Compares the snapshot and the current image using a vertical split. Move your cursor into the image area over the split line and when the cursor changes to a double-arrow, click and drag to move the split. Depending on the image, the split line may not be obvious, so triangular sashes on the outside of the image help you find it.



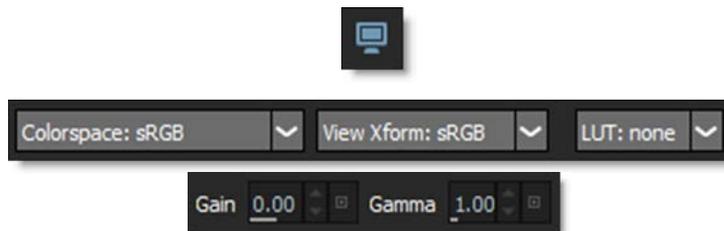
## Horizontal Split

Compares the snapshot and the current image using a horizontal split. Move your cursor into the image area over the split line and when the cursor changes to a double-arrow, click and drag to move the split. Depending on the image, the split line may not be obvious, so triangular sashes on the outside of the image help you find it.



## Display Options

The Display Options icon reveals the color management options which remain visible as long as it is enabled.



Silhouette uses the OpenColorIO standard originally developed by Sony Pictures Imageworks for its color management. You can load custom color configuration files and custom LUTs, apply color space conversions, as well as use other controls for fine tuning. Silhouette includes a set of preset color profiles, plus you can configure and use your own by specifying one in the Color Management > OCIO Configuration preference.

For a more detailed explanation of OpenColorIO, including generating LUT's and suggested workflows, please visit <http://opencolorio.org/>.

**Note:** The color management functionality provided in the Display Options is for display purposes only. The color profiles, LUTs, and colorspace conversions applied in the Viewer do not affect the rendered image.

## Color Management

### Colorspace

Sets the input colorspace of the scene. The following colorspace are provided: Linear, sRGB, rec709, Cineon, Gamma 1.8, Gamma 2.2, Panalog, REDlog, ViperLog, AlexaV3LogC, PLogLin, SLog, Raw.

Silhouette automatically tries to determine the colorspace based on the data in the file and other information from the header. If a colorspace can't be detected, Linear will be selected.

## Display

If you are using a custom OCIO configuration with multiple Display options, the Display pop-up menu appears for you to choose the colorspace of the display. The default OCIO configuration only has one display option. Additional devices can be added in a custom configuration and will show up in this menu.

**Note:** When there is only one Display option, the Display pop-up menu is hidden.

## View Xform (Transform)

Select a colorspace transform to apply to the scene. You can select from sRGB, rec709 or None.

## LUT

Select a custom LUT to apply to the scene.

### Choose

A number of LUT formats are supported including: Flame, Lustre, Color Correction Collection, Color Correction, Cinespace, Houdini, Iridas itx, Iridas cube, Pandora mga, Pandora m3d, Sony Pictures Imageworks 1D, Sony Picture Imageworks 3D, Sony Picture Imageworks mtx, Truelight and Nuke vf.

**Note:** Selecting a LUT disables the Colorspace and View Xform controls.

### Clear List

Clears the LUT list.

## Gain

Adjusts the brightness of the image in F-stops. Gain is applied before the display transform.

## Gamma

Adjusts the gamma of the image. Gamma is applied after the display transform.

Go to the [Color Management](#) tutorial to see how it works.

## ROI (Region of Interest)

ROI (Region of Interest) crops the image in the Viewer to a user defined size and can be animated. This is especially useful when you only need to work within a smaller region of a larger image as it will use less memory and process faster. If expanded, the ROI will display overscan pixels which can then be manipulated.



Go to the [Region of Interest](#) tutorial to see how it works.

### ROI Controls

Once the ROI icon is activated, the ROI controls appear above the Viewer.



### ROI Keyboard Shortcuts

Shortcut	Action
Initial click-drag bounding box	Sets the ROI
Click-drag bounding box points	Scales the ROI
Click-drag bounding box	Positions the ROI
Ctrl/Cmd-Shift-drag	Draws a new ROI

#### Enable

You can toggle the ROI effect on and off by clicking on the Enable icon.



#### ROI Manual Input

If you click on the numeric field to the right of the ROI label, the fields become editable. Just click in the field you want to edit, type in a number and press the Set button.

## Animating the ROI

Enable the animate icon and change the position or size of the ROI at various frames.



## Set ROI to Current DOD

The Set ROI to Current DOD icon automatically sets the ROI to match the size of the source's DOD (Domain of Definition). If the source's DOD is larger than the session, the ROI will expand revealing the overscan pixels which can then be manipulated.



**Note:** The Transform > DOD node can change the DOD of any source.

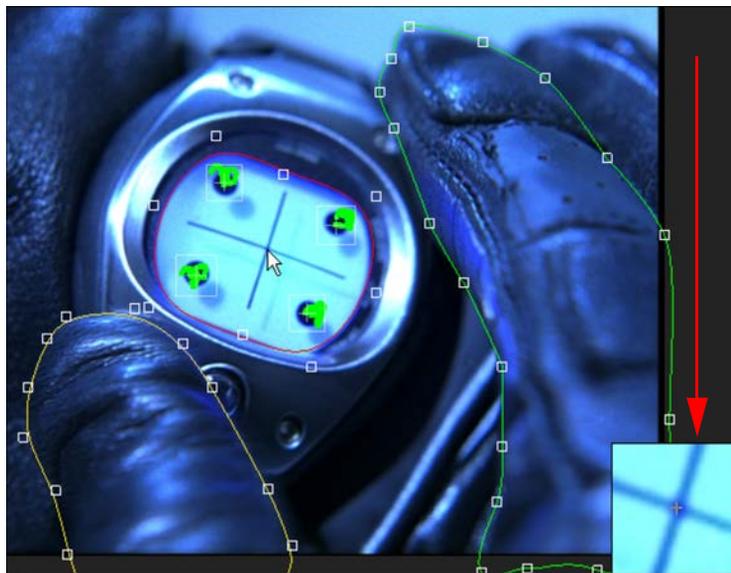
## Reset

Resets the ROI to the session size.



## Magnifier

The Magnifier opens a magnification window at the bottom right corner of the Viewer and displays a zoomed area around the cursor location. It is useful for precise control point, tracker and paint placement. The Magnifier is available in the Reshape and Tracker tools as well as Paint.

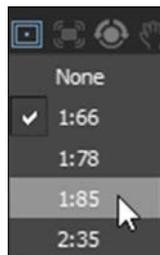


## Masks

Masks aid you in determining what will be projected on film or shown on television by adding reticles and or a variable opacity mask to the Viewer.



The following aspect ratio's are supported: 1:66, 1:78, 1:85, 2:35 as well as Safe Action for video. When an aspect ratio is selected from the Mask pull-down menu, the mask settings defined in the Viewer Preferences are activated. See the [Viewer Preferences](#) section for more information.



## Creating Custom Masks

In the Silhouette/resources folder of your installation, there are two files: formats.xml and masks.xml.

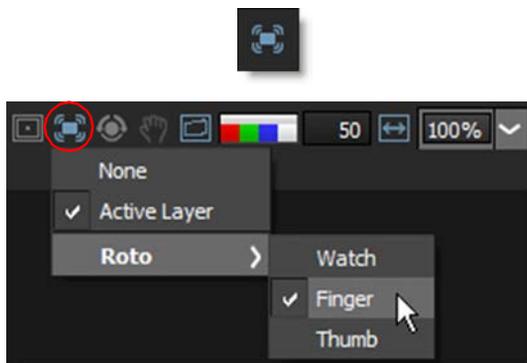
You can add your own custom masks to the masks.xml file. The rectangle values are multiplied by the image width/height to figure out where the mask should be placed. For example, Safe Action is a 90% rectangle, so the border is .1, .1, .9, .9 (i.e. 10%, 10%, 90% 90%) of the image size.

You associate certain masks with certain formats by adding a “Mask” entry to the formats in formats.xml. You can add any number of masks to each format. These masks will be available in the mask selector in the Viewer, depending on the session format.

**Note:** You can't associate masks with “custom” session formats. Instead, you should add a new format to your formats.xml file if you have an odd format you want to use with masks.

## Stabilize

The Viewer is stabilized based on the selected layer's tracking data.



## Rotate

Activates Viewer rotation mode. **Shift-Ctrl/Cmd-R** toggles the Viewer rotation mode. Rotating the Viewer can facilitate rotoscoping and painting.



## Adjust Rotation

Once Rotate is enabled, the Adjust Rotation editing control becomes available.



Adjust Rotation allows you to click and drag in the Viewer to set the angle. **Shift-R** toggles the rotation editing mode on/off.

Go to the [Viewer Rotation](#) tutorial to see how it works.

## Overlay

Toggles the display of overlays which are lines, shapes or objects that Silhouette superimposes over the image. **0**, the number zero, toggles the overlay.



## RGBA

Displays various combinations of the red, green, blue and alpha channels.



### Selecting Channels

Clicking on the Red, Green, Blue or Alpha buttons solo that channel as a gray scale image. The horizontal white bar above the RGBA buttons quickly toggles the display of the image back to full color mode.

### Solo Channels

**Alt-R/G/B/A** toggles the red, green, blue and alpha channels on and off.

### Alpha Display

#### Cycle Alpha

Either press the Alpha button (to the right of the blue button) or the **A** key to cycle the state of the alpha display. Pressing once superimposes the alpha channel over the image. Pressing a second time displays the alpha channel over black. Hitting it again shows only the color image.

**Note:** To view a shape's alpha channel, you must first set the View to Output before pressing the Alpha button or the **A** key.

#### Display Alpha - No Overlay

**Shift-A** toggles the View to Output, superimposes the alpha channel over the image and deactivates the Overlay. Pressing **Shift-A** again returns the Viewer to its previous state.

#### Display Roto Node's Output Alpha

**Alt+O** toggles the view mode to Output and displays the alpha. Pressing **Alt-O** again returns the Viewer to its previous state.

#### Alpha Mix

The numeric entry box next to the RGBA buttons controls the opacity of the alpha channel when it is superimposed over the image.

### Premultiply

You can premultiply the image in the Viewer by using **Shift-0**.

Go to the [Viewer RGBA Buttons](#) tutorial to see how it works.

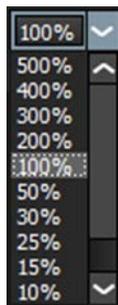
## Aspect Ratio

Activates pixel aspect ratio correction in the Viewer as defined in the session settings. For instance, this lets you view Cinemascope ratio images as they would appear when projected.



## Zooming and Panning

Sets the zoom factor for the image.



### 25%-500%

Choose from one of the preset zoom percentages. 100% displays the image at its actual size at a ratio of one image pixel to one screen pixel.

You can also zoom the image using the scroll wheel on your mouse, the **+** or **=** keys to zoom in, and the **-** key to zoom out or press **Space Bar-Shift** and move the mouse up to zoom in or down to zoom out.

### Fit

Either pressing the **F** keyboard shortcut or selecting Fit from the zoom pop-up window will display the image as large as possible within the Viewer window.

### Home

You can either press the **H** keyboard shortcut or double-click the middle mouse button to set the image to a 100% zoom level and center it in the Viewer.

### Center Selected Object

Press **Ctrl/Cmd-F** to center the select object in the Viewer.

Go to the [Viewer Navigation](#) tutorial to see how to zoom and pan the Viewer.

## Viewer Keyboard Shortcuts

<b>Shortcut</b>	<b>Action</b>
<b>F1</b>	The composite workspace is displayed
<b>F2</b>	The Viewer is displayed full screen
<b>F3</b>	The Viewer and Timeline are displayed
<b>F4</b>	The Viewer and Trees window are displayed
<b>F5</b>	The dual monitor workspace is displayed
<b>0</b>	Toggles the display of overlays which are lines, shapes or objects
<b>1-7 (Number Keys)</b>	Switches the Viewer > View menu
<b>~</b>	Cycles through the update modes
<b>A</b>	Cycles the display between the full color image, the alpha channel superimposed over the image, and the alpha channel by itself
<b>Shift-A</b>	Toggles the View to Output, superimposes the alpha channel over the image and deactivates the Overlay
<b>Alt-R/G/B/A</b>	Toggles the red, green, blue and alpha channels on and off
<b>Alt-O</b>	Toggles the Roto node's view mode to Output and displays the alpha. Pressing <b>Alt-O</b> again returns the Viewer to its previous state.
<b>Shift-Ctrl/Cmd-R</b>	Toggles the Viewer rotation mode on/off
<b>Shift-R</b>	Toggles the Viewer rotation editing mode on/off
<b>Shift-0</b>	Premultiplies the image in the Viewer by the alpha
<b>Alt-]</b>	Cycles to next node in the Node pop-up menu

## Viewer Pan/Zoom Keyboard Shortcuts

<b>Shortcut</b>	<b>Action</b>
Middle-mouse drag	Pans the image
<b>Space Bar</b> -move mouse	Pans the image
<b>+</b> or <b>=</b>	Zooms the image in
<b>-</b>	Zooms the image out
<b>Shift</b> -Middle-mouse drag	Zooms the image in and out
Scroll wheel	Zooms the image in and out
<b>Space Bar-Shift</b> -move mouse up/down	Zooms the image in and out
<b>F</b>	Fits the image in the Viewer
<b>H</b> or Middle-mouse double click	Centers the image in the Viewer at 100%
<b>Ctrl/Cmd-F</b>	Centers selected object in the Viewer
<b>'</b>	Opens a context menu over pen/mouse location

# Toolbars

Along the left side of the Viewer is the Toolbar. It contains icons specific to the selected tool--Paint or Roto.

**Paint Toolbar**



**Roto Toolbar**



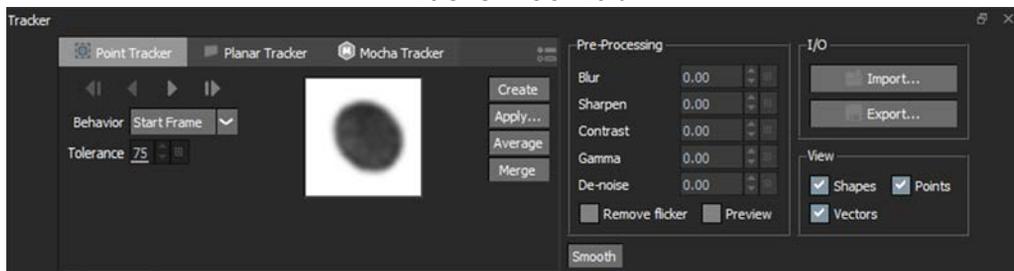
## Tool Tabs

At the bottom of the Viewer is the Tool Tabs. It contains controls specific to the selected tool--Paint or Tracker.

### Paint Tool Tab

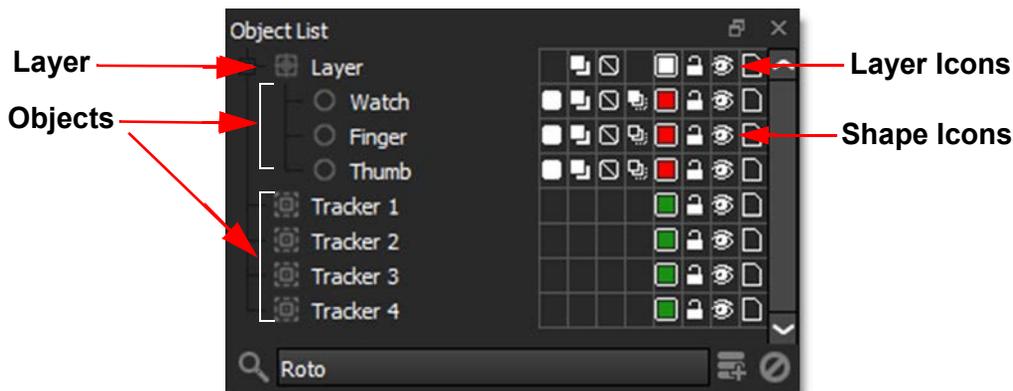


### Tracker Tool Tab



## Roto Object List

The Object List is where you can select, lock, combine, rename or delete shapes, layers and trackers. Layers are containers for shapes and other objects and have their own individual transforms.



### Search

Searches for shapes, layers or trackers in the Object List.



Click the Search icon, enter an object name into the search field and it will appear. Disable the Search icon when done to return to the normal Object List window view.

### Add Layer

Located at the bottom of the Object List, this icon creates a new layer. Layers are used to organize shapes, trackers and other objects, but more importantly they are used to contain the motion information from trackers.



**Note:** Dragging objects onto the New Layer icon will create a new layer and move the objects into it in one operation.

## Deleting

Select an object in the list and press **Ctrl/Cmd-X**, hit the **Delete** key or use the Delete icon at the bottom of the Object List.



## Renaming

You can rename an object by either:

- Clicking on the object once to select it, hitting the **Enter** key, typing in the new name and pressing **Enter** again.
- Double-clicking the object, typing in a new name and hitting the **Enter** key.
- Right-clicking on the object, selecting **Rename** and typing in a new name.

## Selecting

Clicking the name of an object selects it. Multiple objects can be selected by **Shift**-clicking on them. **Ctrl/Cmd**-clicking will add to the selection of objects that are located at different levels of the Object List while **Ctrl/Cmd**-clicking an object after it is selected will deselect it. In addition, if you **Shift**-click a color pot in the Object List, you select all objects of the same type and color.

**Note:** In File > Preferences > Shape on Windows and Linux or Silhouette > Preferences > Shape on Mac, there is a Template Color setting that sets the color and opacity of unselected shapes. This feature is enabled by using **Shift-W**.

## Moving

Objects can be moved by dragging and dropping them to a new position in the list or within another layer.

## Expanding / Collapsing Layers

### Expand All

**Shift**-clicking the +/- icon expands or collapses all nested layers inside that layer.



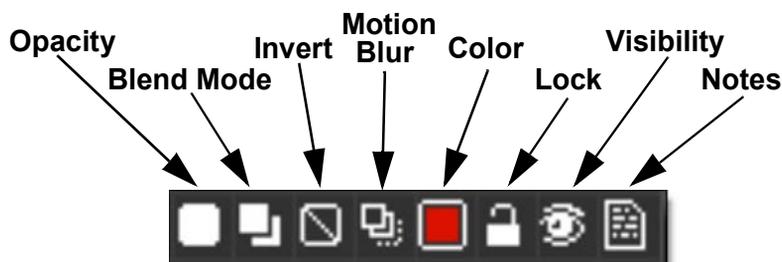
## Expand or collapse multiple layers at once

If expanding or collapsing a selected layer using +/- icon, then any other selected layers with the same parent will also expand or collapse. This can be combined with **Shift** to expand or collapse children as well.

## Icons

### Shape Icons

There are number of icons directly to the right of a shape's name that can be used to modify shapes. The Opacity, Blend Mode, Invert, Motion Blur and Color icons duplicate the functionality of the Shape parameters in the Object window and does so because it is often easier to change these settings in the Object List when multiple shapes are selected.



### Opacity

Indicates the opacity level of a shape. It is white when opacity is 100%, black when 0% and a shade of gray when somewhere in between. When keyframing is activated for Opacity in the Shape parameters, you can quickly keyframe the opacity of a shape from 100% to 0% by toggling this icon.



**Note:** In File > Preferences on Windows and Linux or Silhouette > Preferences on Mac, there is a Shape > Fade Outline with Opacity setting that draws unselected/inactive shape outlines using the Opacity value. This preference can be toggled using the **V** key so that you can easily see any shapes that are at 0% opacity.

## Blend Mode

Controls how shapes are blended together. Each click of the icon cycles through the blend modes. See the [Blend Mode](#) section for information.



## Invert

Inverts selected shapes.



## Motion Blur

Turns Motion Blur on or off for selected shapes.

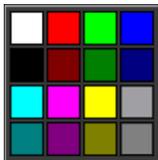


## Outline Color

Sets the color of selected shape's outlines.



Left-clicking the color pot opens a standard color picker while right-clicking on the color pot opens a pop-up color menu with 16 primaries.



## Lock

Locks/Unlocks selected objects. A locked shape cannot be edited or changed and is italicized in the Timeline.



## Visibility

Click the Visibility icon to hide or show selected objects. Only visible shapes are rendered. To solo an object, **Alt**-click on its Visibility icon. **Alt-Ctrl/Cmd**-click to force the visibility of all objects to the on position.



## Notes

Select an object and click the Notes icon to bring the Notes window forward above the Object List.



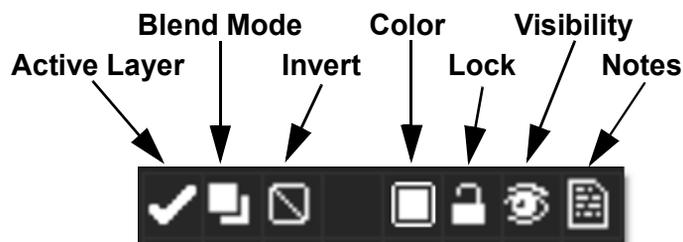
You can type a note for selected objects. Currently, shapes, trackers, depth objects, and layers are supported. Because you can type multiple paragraphs into the Notes window, you must press Apply to assign the note. The Notes icon changes once a note is applied to the object.



- Hovering over the Notes icon displays the note, if there is one, as a tool tip.
- The Status Bar displays the object name and the note for the selected object.

## Layer Icons

There are some icons directly to the right side of a layer's name that can be used to modify layers.



The Layer's Blend Mode, Invert, Color, Lock, Visibility and Notes icons have similar functionality to the ones used by other objects.

## Active Layer

The Active Layer box displays a check mark when the layer is selected. Clicking the checkbox will toggle the state of the Active Layer.



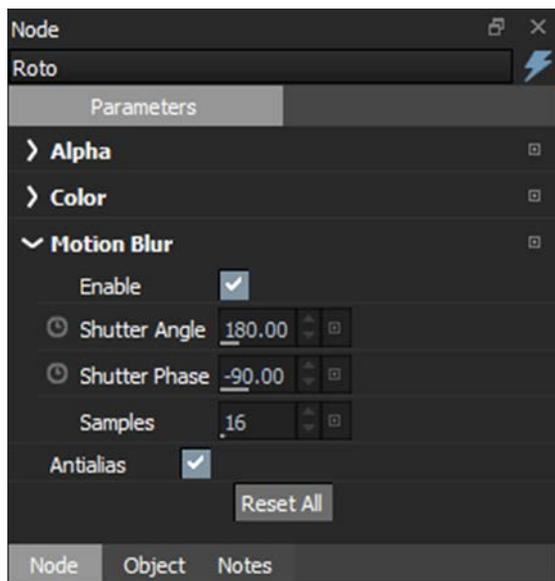
## Object List Shortcuts

<b>Shortcut</b>	<b>Action</b>
Click on an object	Selects the object
<b>Shift</b> -click an object	Adds an object to the current selection
<b>Ctrl/Cmd</b> -click on an object	Toggles the object selection
<b>Shift</b> -click color pot	Selects shapes of same color
<b>Alt</b> -click the Visibility icon	Solos an object
<b>Alt-Ctrl/Cmd</b> -click the Visibility icon	Forces the visibility of all objects to the on position
<b>Shift</b> -click the +/- icon	Expands or collapses all nested layers inside that layer
Double-click an object	Selects the object so it can be renamed

# Parameters

## Node

Parameters specific to the Roto and Source nodes appear in the Node parameters window.



**Note:** The Paint node does not have any Node parameters.

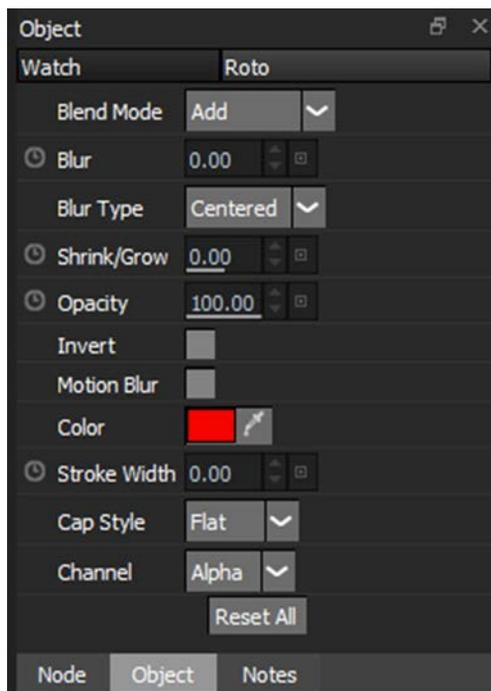
## Enable/Disable

Enables or disables the node.



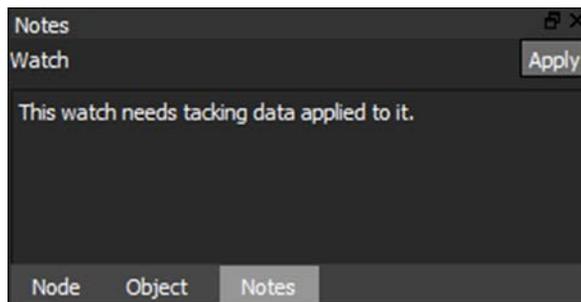
## Object

All of the editable parameters of a shape, layer or tracker can be adjusted in the Object parameters window. When a shape is selected, you will see the controls listed below.



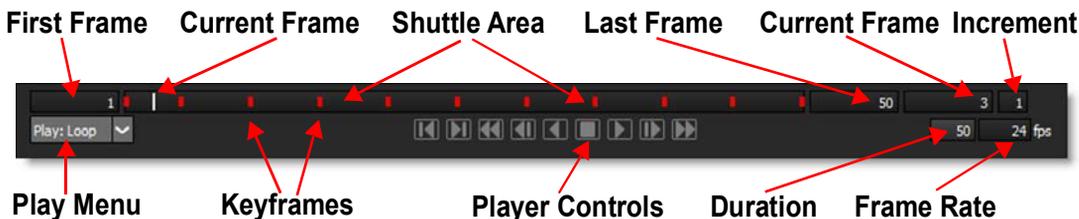
## Notes

The Notes window allows you to type a note for selected objects.



## Timebar / Player Controls

The Timebar below the Viewer provides you with controls to play your clips as well as navigate your session.



### Timebar

#### Keyframe Markers

Colored markers in the Timebar shuttle area signify where selected objects have keyframes. Objects that display keyframes in the Timebar are shapes, trackers and painted frames. Path keyframes are shown for shapes, position keyframes for trackers and painted frames when in the Paint node.



The color of the markers is determined by the object color. If multiple selected objects have a keyframe on the same frame, the most recently selected object's color has precedence. A white marker is used to signify the current frame and hovering over a marker displays a tool tip showing the keyframe time.

**Shift-Alt**-clicking and dragging a marker will move the keyframe in time.

**Note:** In the Paint node, selecting a paint tool ignores the object selection and displays paint keyframe markers instead. To see the keyframe markers of selected objects, select a non-paint tool like Reshape, Transform or Tracker.

#### First Frame

The numeric entry box on the left displays the first frame to be viewed. Enter a new number in the numeric entry box to change the start frame and hit **Enter**. Frame numbers located before the start frame, including negative numbers, can be entered. This is useful when adjusting motion blur at the start of a shot.

## Last Frame

The numeric entry box to the right of the shuttle slider displays the last frame to be viewed. Enter a new number in the numeric entry box to change the last frame and hit **Enter**. Frame numbers located beyond the end frame can be entered. This is useful when adjusting motion blur at the end of a shot.

## Current Frame

The second numeric entry box to the right of the shuttle slider displays the currently viewed frame. Enter a new number in the numeric entry box and hit **Enter** to move directly to that frame.

## Increment

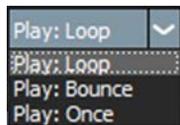
The far right numeric entry box controls the amount of frames that the Viewer increments from frame to frame.

## Fields

When selected, the Fields button changes the Timebar and Timeline to advance and display in half frame increments.

## Play Menu

Changes the playback mode. The Play menu is located at the bottom-left of the Viewer.



### Once

Plays the clip once when you press the Play button.

### Loop

Plays the clip in a continuous loop when you press the Play button.

### Bounce

Plays the clip continuously, alternately forwards, then backwards when you press the Play button.

## Playback Controls

These controls affect playback.



### Shuttle

Clicking and dragging in the shuttle area shuttles through the clip.



### Previous Key

Moves to the previous keyframe.



### Next Key

Moves to the next keyframe.



### Home

Moves to the first frame.



### Previous Frame

Step backward 1 frame.



### Play Backward

Plays backward.



## Stop

Stops playback.



## Play

Plays forward.



## Next Frame

Step forward 1 frame.



## End

Moves to the last frame.



## Playback Controls Keyboard Shortcuts

Shortcut	Action
<b>Z</b>	Step backward 1 frame
<b>Shift-Z</b>	Moves to the previous keyframe
<b>X</b>	Step forward 1 frame
<b>Shift-X</b>	Moves to the next keyframe
<b>J</b>	Plays backward
<b>K</b>	Stops or starts playback
<b>L</b>	Plays forward
<b>Space Bar</b>	Stops playback
<b>Home</b>	Moves to the first frame
<b>End</b>	Moves to the last frame
Click and drag in the shuttle area	Shuttles through the clip
<b>Shift-Alt-click and drag a keyframe marker</b>	Moves the keyframe in time

## Frame Rate

Sets the frame rate for the clip in the Viewer. Enter the desired frame rate, for instance: 24 fps (film), 25 fps (PAL), 29.97 fps (NTSC DF) or 30 fps (NTSC NDF).



## Duration

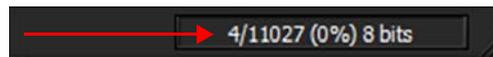
Displays the duration of the clip in the Viewer.



## Real-Time Playback

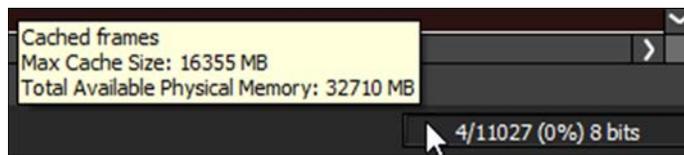
### RAM Cache

Silhouette can cache frames into RAM to guarantee real-time playback. When you hit the play button, each frame is cached into RAM. Once the clip is played through once, it will then play in real-time if enough RAM is available. At the bottom right corner of the interface, there is a numeric readout (Cache Display). It displays the length of your clip, the maximum frames that can be cached into RAM, the percentage of RAM currently being used as well as the session's bit depth.



If your clip is longer than the maximum frames that can be cached into RAM, the clip will not play in real-time.

Hovering over the Cache Display will reveal a tool tip that shows the maximum cache size and total available physical memory in megabytes.



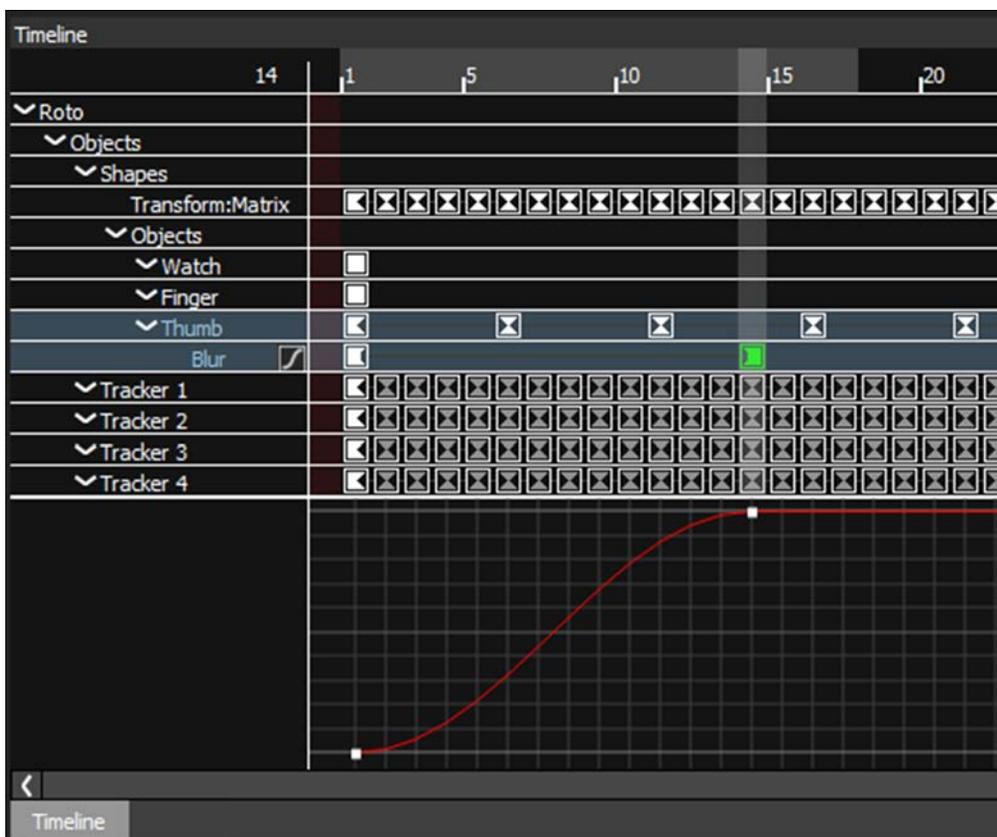
Go to the [Optimizing Playback](#) tutorial to see how you can playback the maximum amount of frames.

### Purge RAM Cache

The RAM cache can be purged by double-clicking on the Cache Display. The currently cached frames are then cleared from RAM.

# Timeline

The Timeline is an overall view of all animated parameters. Animation is the process of setting values at various frames, or keyframes as they are called. These keyframes transition from one to another over time. The Timeline provides you with the tools necessary to view, edit, move or delete keyframes as well as change their interpolation type.



The Timeline is divided in three parts:

- **Parameter List:** lists all animateable parameters for a particular process.
- **Timeline:** displays keyframes over time.
- **Curve Editor:** The Curve Editor is a view mode in the Timeline that allows you to work with keyframe animations expressed as curves on a graph. The Curve Editor is only displayed once the Curve Editor icon is enabled.

Go to the [Timeline](#) tutorial to see how it works.

## Parameter List

The Parameter list shows all objects in the current session. This list is arranged in a collection of shapes, filters, trackers and their associated parameters. Click the twirly to the left of the parameter to either show or hide parameters of a particular object.

## Timeline

The Timeline is an overview of your objects and their keyframes. In the Timeline, you can edit a keyframe's position in time, but not its value.

### Work Range

The Timeline displays the full session range with the work range displayed using a gray bar at the top of the Timeline.

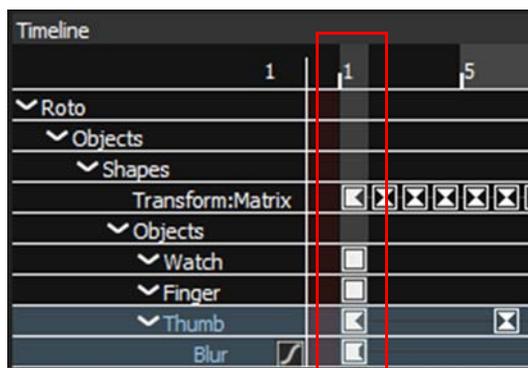


The work range can quickly be adjusted by:

- **Ctrl/Cmd-drag** the ends of the work range bar to change the start and end.
- **Ctrl/Cmd-drag** the work range bar to slide it forward and back while maintaining the duration.

### Current Time Indicator

The vertical line in the Timeline is the current time that you are parked at. To move the Current Time Indicator, just click and drag the shuttle slider below the Viewer or in the top line of the Timeline.



To center the timeline on the current frame, click the top left corner of the Timeline above the object labels.

## Out of Bounds Indicator

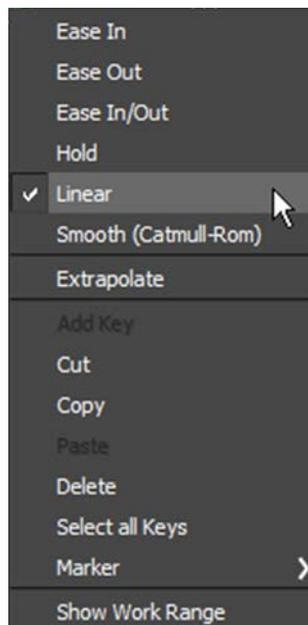
The area before the first frame and after the last frame (the area between the actual session range and the work range, if extended) is shaded red in the timeline to show the usable, but out of bounds area.

## Zooming and Panning the Timeline

The Timeline shows the duration specified for the current session. You can zoom in or out using the mouse scroll wheel to see the Timeline in more or less detail and can pan horizontally or vertically using the **Spacebar** while clicking and dragging.

## Timeline Pop-up Menu

Right-click over a selected keyframe in the Timeline or point in the Curve Editor to open the Timeline pop-up menu.



## Interpolation

### Ease

Ease allows you to smoothly transition in or out of a keyframe.

- **Ease In**

Eases in to the selected keyframe.

- **Ease Out**

Eases out of the selected keyframe.

- **Ease In/Out**

Eases in and out of a selected keyframe.

## Hold

There is no interpolation and abrupt switches in value occur at keyframes.

## Linear

When values change, a straight line with sharp, abrupt angles from one keyframe to the next is drawn.

## Smooth (Catmull-Rom)

Smooth (Catmull-Rom) creates a smooth animation curve between keyframes.

## Extrapolate

Extends the path of the curve beyond the first or last points.

**Note:** When the Shape > Interpolation Engine preference is set to Spatial (Nuke-compatible), shape keyframes can only be set to Smooth (Catmull-Rom), Hold and Extrapolate. This ensures that shapes using Smooth (Catmull-Rom) interpolation in Silhouette exactly match the result in Nuke when exported.

## Add Key

Right-click over the property you are interested in at the desired frame in the Timeline and select Add Key. Keyframes will be added to that property for all selected objects.

**Note:** You can also **Alt**-click in the Timeline to add a keyframe.

## Cut

Deletes the currently selected keyframe or keyframes.

## Copy

Copies the currently selected keyframe or keyframes.

## Paste

Pastes the currently selected keyframe or keyframes.

## Delete

Deletes the currently selected keyframe or keyframes.

**Note:** Individual shape points can be copied and pasted between keyframes using **Ctrl/Cmd-Alt-C** to copy and **Ctrl/Cmd-Alt-V** to paste.

## Select All Keys

When hovering over a track, it will select all keyframes for that track. If not over a track (empty area), it will select all keyframes in the timeline.

## Marker

Marker allows for the creation, editing or deletion of markers. Markers are a handy way of placing notes at specific points in time and are displayed as light blue squares at the top of the Timeline.



Hovering the cursor over the marker will display the marker's text as a tool tip.

## Create/Edit

A dialog box opens where you can enter, change, or clear text for the marker. When you enter text and click OK, a marker is displayed.

## Delete

Deletes the marker at the current frame.

## Delete All

Deletes all markers.

## Show Work Range

When enabled, the Timeline displays only the start and end frames of the Work Range.

## Moving One Keyframe in Time

A single keyframe can be moved by selecting it and then dragging it to a new location.

## Moving a Selection of Keyframes in Time

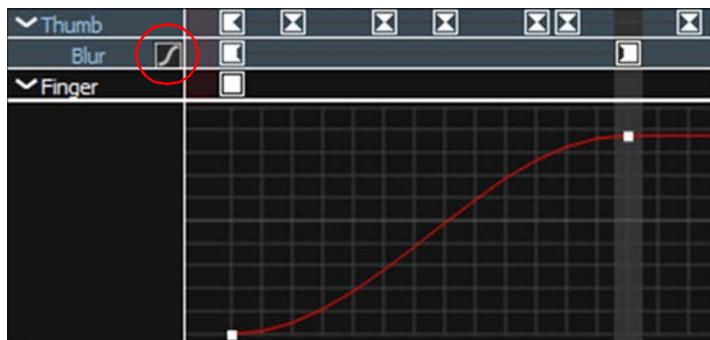
Multiple keyframes can be moved by first selecting a range using the **Shift** key and then dragging on them to a new location.

## Selecting Objects

Objects can be selected within the Timeline. Clicking the name of an object selects it. Multiple objects can be selected by **Shift**-clicking on them. **Ctrl/Cmd**-clicking an object after it is selected will deselect it.

## Curve Editor

The Curve Editor is a view mode in the Timeline that allows you to work with keyframe animations expressed as curves on a graph. It allows you to visualize the interpolation of the animation.



The Curve Editor is only displayed once the Curve Editor icon, located to the right of the parameter in the Timeline, is enabled.



**Timeline Keyboard Shortcuts**

<b>Shortcut</b>	<b>Action</b>
Scroll wheel	Zooms the Timeline in and out
<b>Shift</b> -Middle-mouse drag	Zooms the Timeline in and out
<b>Space Bar</b> -move mouse	Pans the Timeline
<b>Middle</b> -mouse drag	Pans the Timeline
Single-click keyframe	Selects one keyframe
<b>Ctrl/Cmd</b> -click keyframe	Toggle the keyframe selection
<b>Shift</b> -click keyframes	Selects a range of keyframes
<b>Alt</b> -click	Inserts a keyframe
Right-click keyframe	Opens Timeline pop-up menu
Click-drag keyframe	Moves the keyframe
<b>Ctrl/Cmd</b> -drag the ends of work range bar	Changes the start and end of the work range
<b>Ctrl/Cmd</b> -drag the work range bar	Slides the work range forward and back
Click top left corner of the Timeline	Centers the timeline on the current frame

**Curve Editor Keyboard Shortcuts**

<b>Shortcut</b>	<b>Action</b>
<b>Alt</b> -click on curve	Inserts a point on the curve
Click-drag curve point	Moves the curve point
+ or =	Zooms the Curve Editor in
-	Zooms the Curve Editor out
<b>Space Bar</b> -move mouse	Pans the Curve Editor
Hover cursor over curve	Displays the current curve value
Right-click curve point	Opens Curve pop-up menu

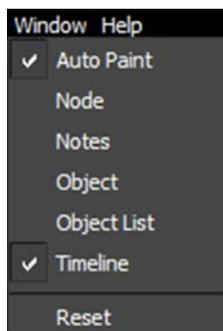
## Windows and Adjustments

The Silhouette interface contains multiple windows. Windows can be closed, torn off to be a floating window, or moved to a new location. The upper right portion of the window has two icons: a Minimize/Maximize and a Close icon.

Minimize/Maximize →  ← Close

### Opening and Closing Windows:

- Click the Close icon to close a window.
- Once a window has been closed, it can be reopened by selecting it from the Window pull-down menu.

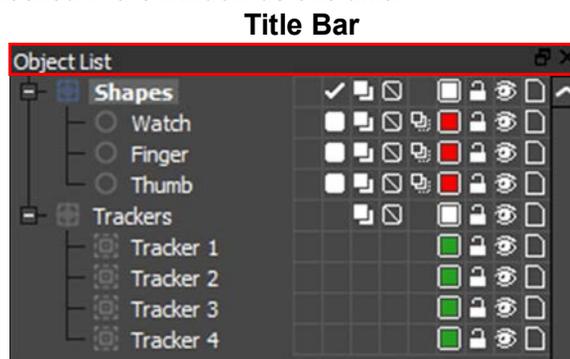


### Creating Floating Windows:

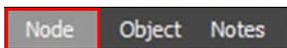
- Click the Minimize/Maximize icon to make the window a floating window.

### Moving Windows:

- Click and drag a window's title bar and place it in a new location. This moves all of the tabs docked in the window as one unit.



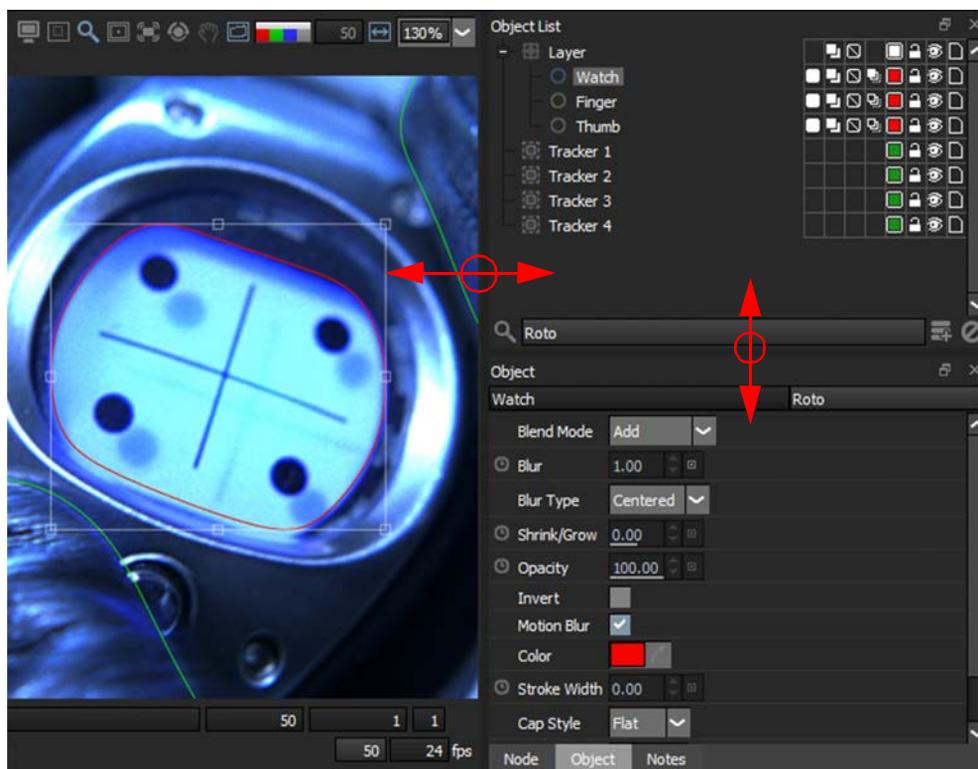
- Click and drag a tab and place it in a new location. This moves only the single tab.



- If you drop the window in the center of an existing window, a tab will be created so that both windows will share the same space. This is the same as the Node, Object, and Notes windows sharing the same location.
- Windows can be docked next to each other. For instance, you can put the Object List to the left of the Trees window with both being docked to the right of the Viewer.

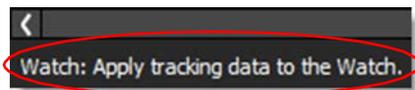
## Sashes

By clicking and dragging the sashes, dividing lines between areas of the screen, you can customize the Silhouette interface.



## Status Bar

The Status Bar is located at the bottom left of the user interface and displays various messages.

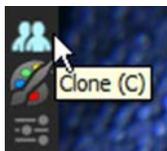


## Cursor Position Color Values

The cursor position color values when in the Paint node are displayed in the Status Bar.

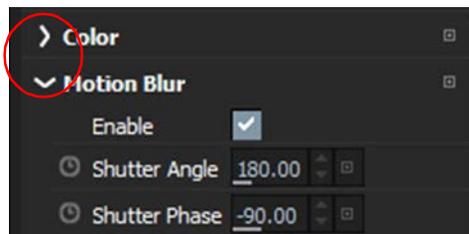
## Tool Tips

Hovering the cursor over an icon will pop up a tool tip that displays its function.



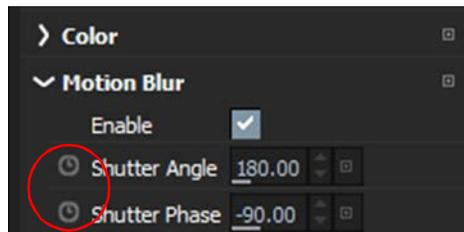
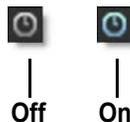
## Twirly Icons

Effect groups in the Node and Object parameter windows can be expanded and collapsed using the Twirly icons located to the left of the group.



## Animate Icons

Animateable parameters in the Parameters and Object windows have an Animate icon to the left of them. Keyframes are set when the Animate icon is enabled (highlighted).



## Numeric Keyboard

Single clicking on a numeric field opens a numeric keyboard.



## Numeric Fields

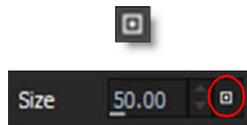
Drag on a numeric field to adjust the value. You can adjust any value with finer precision by pressing **Ctrl/Cmd** while dragging.



**Note:** When the cursor is hovering over a Numeric Field, the Arrow keys can adjust the value.

## Reset Icons

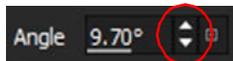
Individual parameters as well as parameter groups can be reset to their default settings using the Reset icon.



## Mouse Wheel Adjustments

Hover over a numeric field and use **Alt**-mouse wheel to adjust it. Use **Alt-Shift** for a 10 time larger change. Use **Alt-Ctrl/Cmd** for 10 time smaller change.

## Spin Box



Spin boxes change values according to the following key strokes:

- **Click** = change by 1 pixel.
- **Shift-click** = change by 10 pixels.
- **Ctrl/Cmd-click** = change by 0.1 pixel.
- **Middle-Mouse button-click, hold and drag back and forth over spin box arrows** adjusts the value.

**Note:** When the cursor is hovering over a Spin Box, the Arrow keys can adjust the value.

# Pull-Down Menus

## File

### Save Project

Projects can be saved by choosing Save.

### Open Backup

Opens a browser that lists the available backups by date and time which can then be loaded.

### Revert Project

You can revert to the last saved version by selecting Revert.

### Import

Imports shapes into the Silhouette Roto node.

## Edit

### Undo

Undo operations.

### Redo

Redo operations.

### Cut

Cuts the selected object.

### Copy

Copies the selected object.

### Paste

Pastes the selected object.

### Duplicate

Duplicates the selected object.

### Delete

Deletes the selected object.

## Select All

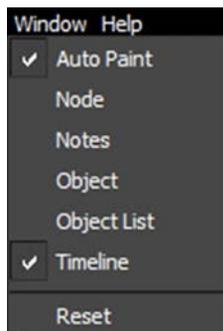
Selects all shapes.

## Deselect All

Deselects all shapes.

## Window

The various Silhouette interface windows are displayed with checkboxes next to them. When the box is checked next to an item, that particular window is displayed in the user interface.



## Help

### About

Shows the Silhouette version.

### User Guide

Opens the Silhouette User Guide.

### What's New

Opens the Silhouette What's New document.

### Check for Update

Checks to see if a newer version of Silhouette is available.

### License

Opens the license tool.

## PAINT

Silhouette is a high dynamic range, non-destructive, 2D raster based paint system that was designed from the ground up to handle the demands of feature film and television production. Now, the same Academy Award winning paint tools used by visual effects artists worldwide can be used for paint and retouching in Adobe After Effects & Premiere Pro, Foundry NUKE, Blackmagic Resolve & Fusion, and Magix Vegas host applications.



Black & White, Blemish, Blur, Burn, Clone, Color, Color Correct, Cutout, Detail, Dodge, Drag, Eraser, Grain, Mosaic, Repair and Scatter brushes are available for any task. As you paint, every action you make is recorded as events. These events can be selectively played back on the same frame, different frames, multiple frames and with or without tracking data applied. This makes for a very powerful and versatile Auto Paint feature that provides the flexibility of vector paint with the speed of a raster paint system.

Go to the [Paint](#) tutorial to see how it works.

# Projects

When Silhouette is applied, you are required to create or open a project before you can begin painting. A project contains the painted frames as well as a complete record of the paint history so that it can be reproduced at any time.

## Autosave and Backups

An autosave and backup system ensures that you will not lose any of your work. Autosaves and backups are stored in the project folder.

### Autosaves

The Auto Save > Interval (minutes) preference specifies how often to update the autosave file which is named autosave.sfx. If Silhouette crashes, you are given the choice to open the autosave file when re-opening the project. When projects are closed or saved normally, the autosave file is automatically deleted.

### Backups

The Auto Save > Maximum # of Backups preference controls how many backup files are created. Each time a project is saved, a backup copy is stored. The most recent backup is backup.sfx, the second most recent is backup.1.sfx, then the next is backup.2.sfx, etc., up to the maximum number of 5. As each new backup is added, the files are rotated upward.

# Applying Silhouette

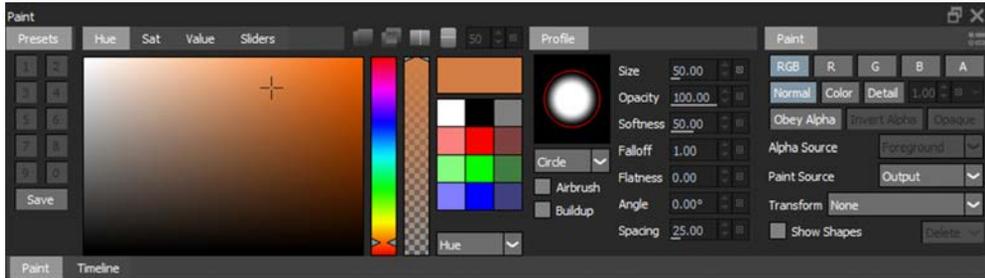
- 1 Start your host application and apply Silhouette:**
  - **After Effects: Apply Silhouette Paint to a clip in the timeline from the Effects > Boris FX Silhouette menu.**
  - **Premiere Pro: Apply Silhouette Paint to a clip in the timeline from the Effects > Video Effects > Boris FX Silhouette group.**
  - **OFX: The method for applying an OFX plug-in varies. Consult the OFX software documentation for details.**
- 2 To use Optional Clone Sources inputs in Silhouette:**
  - **After Effects/Premiere Pro: Select the layers using the Optional Clone Sources > Input 1-2 pop-up menus.**
  - **OFX: For node based hosts, connect sources to the Silhouette node's Input 1-2 inputs. For layer based hosts, select the layers using the Silhouette plug-in's Optional Clone Sources > Input 1-2 pop-up menus.**
- 3 Open the Silhouette user interface.**
  - **After Effects/Premiere Pro: Click the Silhouette Interface > Open button.**
  - **OFX: Click the Open Silhouette Interface button.**
- 4 When prompted, enter the name of your Silhouette project, set the Working Depth and click Create Project.**

The Silhouette user interface opens.

In most cases, the Working Depth should match the host application's bit depth.

# Paint

Various non-animateable controls are organized into Presets, Brush, Profile and Paint tabs.



## Presets

A Presets tab contains 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 and Save buttons on the left side of the Paint window and allows you to save all of the brush parameters as a preset.



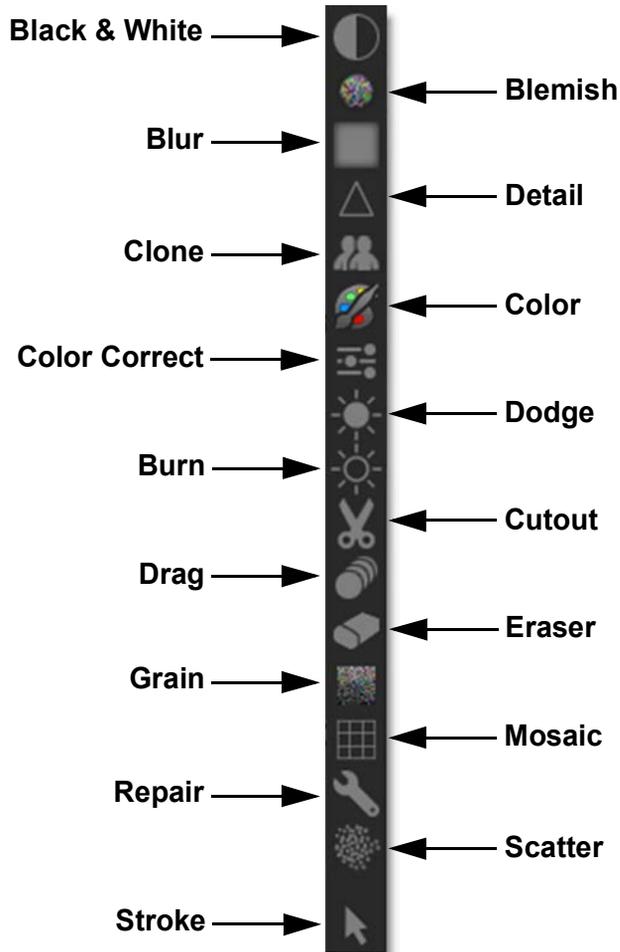
To save a preset, select a brush and adjust its controls, click Save and then choose one of the numbered presets. **Shift-Save** will save to the currently selected preset without having to hit the number too. Once saved, you can use the **Alt-0** through **Alt-9** keyboard shortcuts to quickly select one of the presets.

**Note:** Saved presets are highlighted blue. Clicking a blue preset after selecting Save will overwrite it.

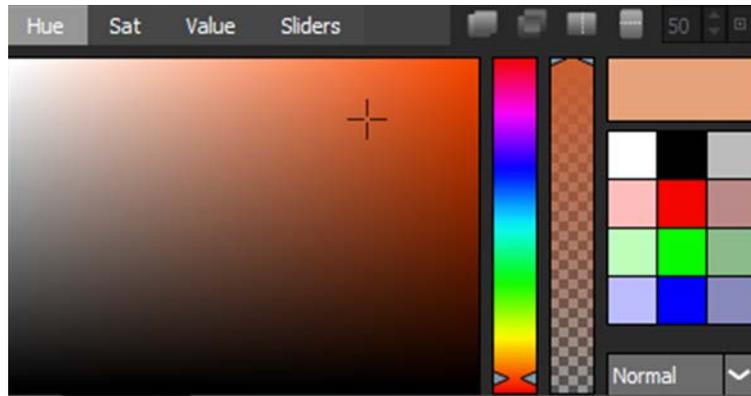
Clear a paint preset by pressing Save, then **Alt**-clicking on the preset.

## Brushes

A number of different brushes are selectable from the Paint toolbar to the left of the Viewer.



Once a brush is selected, its controls appear on the left side of the Paint window.



To paint with a mouse, click and drag on the screen. To paint with a pen and tablet, just press and drag.

### Drawing Straight Lines

If you press **Alt**, click and then click in a different location, a straight line is drawn. This will work with any brush type. If you keep **Alt** depressed while clicking, you will create interconnected straight lines.

### Black & White (B)

The Black & White brush converts color images to black and white simulating the look of black and white photographic filters.



#### Mode

Selects the method by which the color image is converted to a monochrome image.

#### Luminance

Creates a monochrome image using the brightness of the image.

#### Average

Creates a monochrome image using the average of the red, green and blue channels.

**Red**

Simulates a red filter in black and white photography.

**Green**

Simulates a green filter in black and white photography.

**Blue**

Simulates a blue filter in black and white photography.

**Yellow**

Simulates a yellow filter in black and white photography.

**Orange**

Simulates an orange filter in black and white photography.

**Blemish (Shift-B)**

The Blemish brush is useful for removing facial blemishes on film originated footage. It combines the Blur and Grain brushes.

**Blur (Ctrl/Cmd-B)**

Blurs the image.

**Radius**

Sets the amount of blur to be applied.

**Burn (Alt-Shift-B)**

Darkens areas in the image.

**Exposure**

Sets the brightness of the brush.

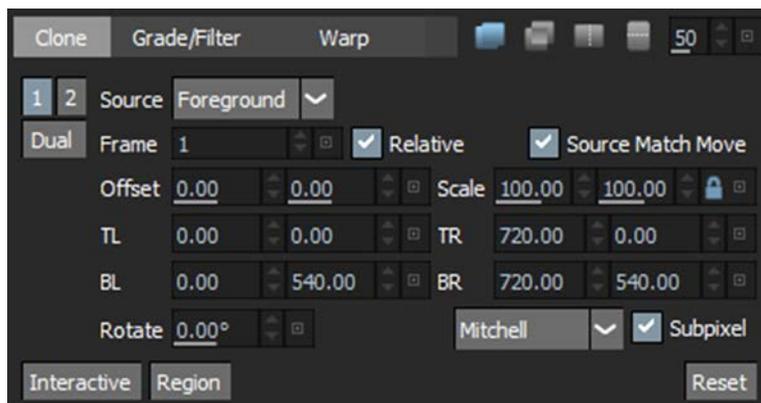
## Range

### Shadows, Midtones, Highlights, Full

Targets the Burn operation to either shadows, midtones or highlights as well as the entire range when set to Full.

## Clone (C)

Paints with sampled pixels from an image with the ability to grade (color correct), blur, sharpen or warp the clone source.



Go to the [Clone Brush](#) tutorial to see how it works.

The controls for the Clone brush are split into three tabs: Clone, Grade/Filter and Warp. The Clone tab deals with the selection, timing and transformation of the clone source. The Grade/Filter tab contains color correction (grade), blur and sharpening parameters. Last, the Warp tab has warp related controls.

## Clone

### Setting the Clone offset on the same image:

- 1 Press and hold down the Shift key and then click, drag and release the mouse and then the Shift key. The first click sets the clone source and where you drag and release is the Clone target.

or

- 2 Press and hold down the Shift key. Click once to set the clone source and click once again in a different location to set the Clone target.

To reset the Clone offset, press Shift and without moving the cursor, click your mouse or tap your pen on the screen once.

### **Setting the Clone offset on different images:**

Oftentimes, you need to align the same feature in two different images of a clip when painting with the Clone brush.

**1 In the Clone controls, select Output, Foreground or Input 1-2 in the Source pop-up menu and then set the Frame parameter to choose which source frame to paint from.**

**2 Press the ' key (located to the left of 1 key).**

The clone source image automatically appears in the Viewer.

**3 Set the Onion Skin mix to 100.**

**4 Click on the clone source feature that you want to paint from.**

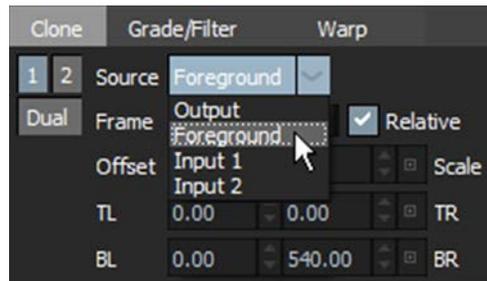
The Clone target image automatically appears in the Viewer.

**5 Click on the Clone target feature that you want to paint on.**

The Clone offset is set.

### **Source**

Picks which image will be used as the clone source.



### **Output**

Clones from the previously painted areas.

### **Foreground**

Clones from the foreground image.

### **Input 1-2**

Clones from the clips assigned to Paint's Optional Clone Sources > Input 1-2 inputs.

## Frame

Choose which frame number of the clone source to paint from. By default, the Frame field displays the actual frame number that you are cloning from. Alternatively, a frame offset can be displayed instead. This behavior is controlled with the Paint > Clone > Absolute Frame Numbers preference.

## Relative

When the Relative box is checked, the clone source Frame value remains relative to the current frame. So, if the Frame value is different than the current frame, the offset between the two is maintained.

When Relative is unchecked, the clone source is painting from a single frame defined by the value entered in the Frame field.

## Transform Controls

The Transform Controls allow you to position, scale, rotate, skew and corner-pin the clone source.



## Source Match Move

Source Match Move allows you to apply the selected tracked layer to the clone source. This is useful for when you have a single frame, clean plate that needs to be tracked to match the motion of the clip you are painting on.

**Note:** To Match Move the clone source during event playback, you will need to:

- 1) In the Tracker, track an object and apply the tracker to a layer.
- 2) Select a tracked layer in the Paint tab's Transform pop-up menu.
- 3) Enable Clone > Source Match Move prior to painting.

For more information on playing back paint strokes, go to the [Auto Paint](#) tutorial.

## Offset

Sets the horizontal and vertical position of the clone source.

## Scale

Sets the horizontal and vertical scale of the clone source. Typing in negative values will flip or flop the clone source.

### Corner-Pin

- **TL**

Sets the horizontal and vertical position of the top left corner point.

- **TR**

Sets the horizontal and vertical position of the top right corner point.

- **BL**

Sets the horizontal and vertical position of the bottom left corner point.

- **BR**

Sets the horizontal and vertical position of the bottom right corner point.

### Rotate

Sets the rotation of the clone source.

### Nudging the Clone Source

The clone source can be nudged using the Arrow keys. One press of the Arrow key moves the clone source 1 pixel. Using the **Shift** key in conjunction with the Arrow keys moves the clone source 10 pixels. **Ctrl** plus the Arrow keys moves the clone source one tenth of a pixel. These nudge values can be changed in the Preferences menu located in File > Preferences > Nudging on Windows and Linux or Silhouette > Preferences > Nudging on Mac. Holding an Arrow key down slides the clone source.

### Q (Translate), W (Rotate), E (Scale)

Pressing **Q**, **W** or **E** and then clicking and dragging will translate, rotate or scale the clone source. Pressing **Q**, **W** or **E** a second time deactivates the mode. Also, the position of the cursor when **W** or **E** is pressed sets the anchor point for the rotation or scale operation.

**Note:** Onion Skin mode is automatically activated once the **Q**, **W** or **E** keys are pressed.

### Corner-Pin

When Interactive mode is enabled, you can corner-pin the clone source by dragging the handles on the corners of the image. Alternatively, you can select and move the corner points without being in Interactive mode by using

**Ctrl/Cmd-1,2,3** or **4** to select the top left, top right, bottom right and bottom left corner points. Then, use the mouse, pen/tablet or **Arrow** keys to move the points. Pressing **Ctrl/Cmd-1,2,3** or **4** a second time deactivates the mode.

### Clone Transform Nudging Keyboard Shortcuts

<u>Shortcut</u>	<u>Action</u>
<b>Arrow</b> keys	Moves the clone source by 1 pixel
<b>Shift-Arrow</b> keys	Moves the clone source by 10 pixels
<b>Ctrl/Cmd-Arrow</b> keys	Moves the clone source by one tenth of a pixel
Hold down <b>Arrow</b> keys	Moves the clone source continuously
<b>Q, W, E</b> then <b>Arrow</b> keys	Translates, Rotates or Scales by 1 pixel
<b>Q, W, E</b> then <b>Shift-Arrow</b> keys	Translates, Rotates or Scales by 10 pixels
<b>Q, W, E</b> then <b>Ctrl/Cmd-Arrow</b> keys	Translates, Rotates or Scales by 1/10 of a pixel
<b>Ctrl/Cmd-1</b> then Arrow Keys	Nudges the top left corner point
<b>Ctrl/Cmd-2</b> then Arrow Keys	Nudges the top right corner point
<b>Ctrl/Cmd-3</b> then Arrow Keys	Nudges the bottom right corner point
<b>Ctrl/Cmd-4</b> then Arrow Keys	Nudges the bottom left corner point

### Clone Transform Keyboard Shortcuts

<u>Shortcut</u>	<u>Action</u>
<b>Q</b>	Activates / Deactivates translation of the clone source
<b>W</b>	Activates / Deactivates rotation of the clone source
<b>E</b>	Activates / Deactivates scaling of the clone source
<b>Q, W, E</b> then <b>Ctrl/Cmd</b>	Translates, Rotates or Scales in finer increments
<b>Ctrl/Cmd-W</b>	Rotates without setting the anchor point
<b>Ctrl/Cmd-E</b>	Scales without setting the anchor point
<b>Ctrl/Cmd-1-4</b>	Selects the top left, top right, bottom right and bottom left corner points so they can be moved
<b>.</b> (Period key)	Sets the anchor point

## Interactive

Activates the on-screen controls.

Interactive

Turn off Interactive mode when you want to Paint. When Interactive is selected, you can position, scale, rotate, corner-pin and skew the clone source using the on-screen controls.



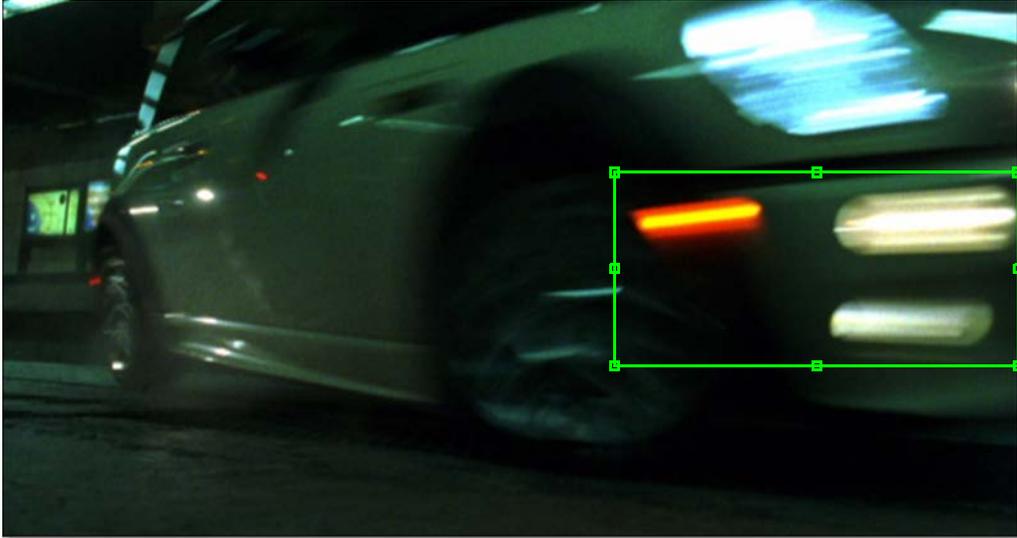
## Clone Transform On-Screen Controls

Shortcut	Action
Drag within large center circle	Moves the clone source
<b>Shift</b> -drag within large center circle	Constrain clone source movement horizontally or vertically
Drag the center square horizontal and vertical halfway points	Scales the clone source horizontally or vertically
Drag a center square corner	Proportionally scale the clone source
Drag large center circle	Rotate the clone source
<b>Ctrl/Cmd</b> -drag large center circle	Rotates the clone source with finer control
Drag handles on corners of image	Corner-pins the clone source
Drag dash above large circle	Skews the clone source horizontally
Drag dash to the right of large circle	Skews the clone source vertically

## Region

Changes the position and size of the on-screen control rectangle which allows the effect of the corner-pin to be controlled from a specific area. The center of the new region also becomes the anchor point for scale and rotation.

Region



### Using a Region

- 1 **Press Region.**
- 2 **Click and drag around an area of interest.**

A region appears.

- 3 **Turn on Interactive and adjust the Clone transform.**

Now, when you adjust the Clone transform, the region is used.

### Region Shortcuts

<u>Shortcut</u>	<u>Action</u>
Click and drag	Creates a region
<b>Alt</b> -click and drag	Creates new region when one already exists
Click and drag inside a region	Moves the region
Drag the region handles	Resizes the region
Tap outside a region box without dragging	Resets the region to full screen

## Clone Transform On-Screen Controls With Region Set

<b>Shortcut</b>	<b>Action</b>
Drag within region	Moves the clone source
<b>Shift</b> -drag region	Constrains the clone source movement horizontally or vertically
Drag edge handle	Scales the clone source horizontally or vertically
<b>Shift</b> -drag corner or edge handle	Proportionally scale the clone source
<b>Ctrl/Cmd</b> -drag on corner handle	Rotate the clone source / Continue holding <b>Ctrl</b> to adjust with finer control
Drag on a corner handle	Corner-pins the clone source
<b>Ctrl/Cmd</b> -drag on edge handle	Skews the clone source

## **Filter**

Chooses the filtering method when transforming the clone source. Mitchell is the default.

### **Triangle**

The Triangle filter is not the highest quality, but fine for scaled images.

### **Quadratic**

Quadratic is like triangle, but more blur with fewer artifacts. It offers a good compromise between speed and quality.

### **Cubic**

Cubic is the default filter in Photoshop. It produces better results with continuous tone images, but is slower than Quadratic. If the image contains fine details, the result may be blurrier than desired.

### **Catmull-Rom**

This produces good results with continuous tone images which are scaled down, producing sharp results with fine detailed images.

### **Gaussian**

Gaussian lacks in sharpness, but is good with ringing and aliasing.

### **Mitchell**

A good balance between sharpness and ringing, Mitchell is a good choice when scaling up.

### **Sinc**

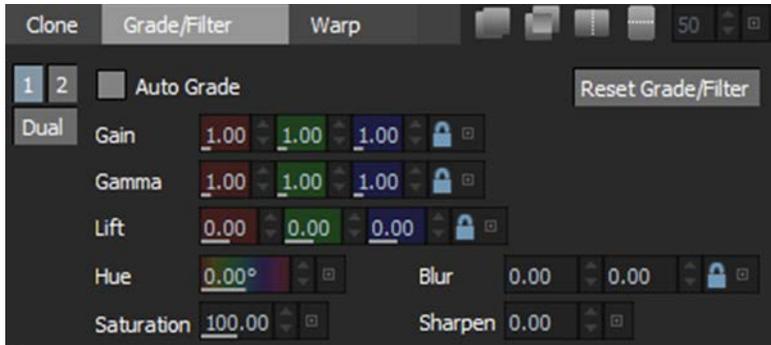
Keeps small details when scaling down with good aliasing.

### **Subpixel**

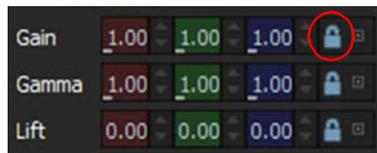
When activated, subpixel positioning is used when moving the clone source.

## Grade/Filter

The clone source can be color corrected (graded), blurred or sharpened.

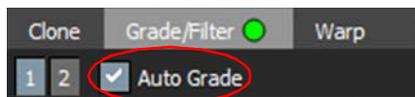


The parameters are ganged together by default. To deactivate Gang, press the Lock icon located to the right of each parameter group.



## Auto Grade

Auto Grade automatically grades the clone source to match the location you are painting.



**Note:** The Gain, Gamma, Lift, Hue and Saturation controls are disabled when using Auto Grade.

## Gain

### Red

Multiplies red values.

### Green

Multiplies green values.

### Blue

Multiplies blue values.

## Gamma

### Red

Adjusts red gamma values.

### Green

Adjusts green gamma values.

### Blue

Adjusts blue gamma values.

## Lift

### Red

Adds red values.

### Green

Adds green values.

### Blue

Adds blue values.

## Hue

Rotates the hue.

## Saturation

Adjusts saturation. Positive values saturate, negative values desaturate.

## Blur

Blurs the clone source.

## Sharpen

Sharpens the clone source.

## Reset Grade/Filter

Resets all Grade/Filter controls.

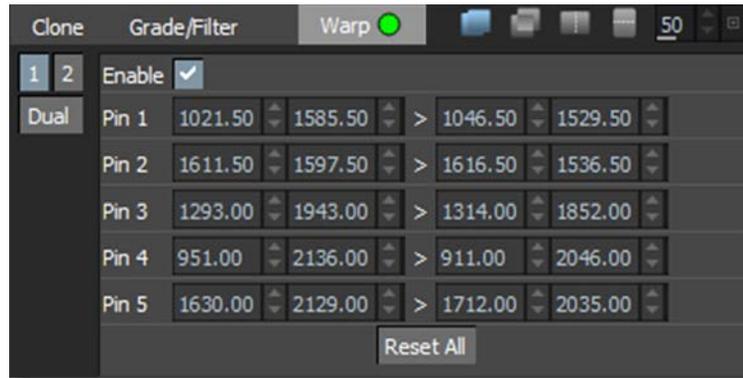
**Note:** Once a Grade/Filter parameter has been adjusted, a green dot appears to the right of the tab to indicate that a change was made.



Grade/Filter

## Warp

Warp allows you to warp specific image areas using pins, while leaving other areas untouched. Adjustments can range from subtle nip and tucks to something more obvious like repositioning an arm or leg.



### Enable

Enables/disables warping. This is useful to turn the warping effect on and off.

### Pin 1 - 20

A total of 20 pins can be added to an image. To create a pin, click-drag on the image. Pins have a source (green circle) and target (red circle). The farther the target is dragged from the source, the more the image warps. Click-releasing on the image sets a tack which constrains the warp.

### Pin and Tack Radius

Each pin and tack has a radius which determines its strength. Hover over a pin to display the radius. **Shift**-drag the radius to adjust it.

### Transform

Selects tracked layers from the Tracker and match moves the pins based on the input tracker data.

**Note:** Once a Warp parameter has been adjusted, a green dot appears to the right of the tab to indicate that a change was made.

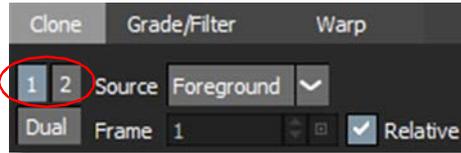


## Clone > Warp Keyboard Shortcuts

<b>Shortcut</b>	<b>Action</b>
Click-drag on image	Creates a pin
Click-release on image	Creates a tack
Click-drag pin (source or target)	Moves the pin (source or target)
<b>Shift</b> -drag pin (source or target)	Moves both pins (source and target)
<b>Ctrl/Cmd</b> -drag pin radius	Adjusts pin radius with all radii displayed
<b>Hover over pin, Shift</b> -drag pin radius	Adjusts pin radius with only selected pin radius displayed
<b>Alt</b> -drag on a tack	Converts a tack to a pin
Right-click > Remove Pin	Deletes the pin
Right-click > Make Tack	Converts a pin to a tack

## Dual Clone

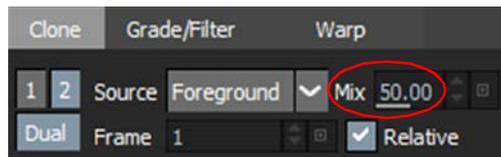
Dual Cloning allows you to paint from two different frames simultaneously, using separate Transform, Grade/Filter and Warp settings. To Dual Clone, create two Clone presets using the 1 and 2 button presets on the left side of the Clone tab.



To save a preset, click on one of the numbered presets and adjust the Clone controls. This includes the Clone Source, Frame Offset, Transform, Grade/Filter, and Warp settings. Once you have different settings for the two presets, press the Dual button to enable both presets simultaneously.



When you do so, a Mix control appears to the right of the Clone controls. Mix sets the relative opacity of the two clone sources.



When you paint, both Clone presets will contribute to the painted result.

**Note:** You can use the **Shift-Alt-1** and **Shift-Alt-2** keyboard shortcuts to quickly select one of the Clone presets.

## Reset

Resets all Clone brush transform controls.

## Color (Shift-C)

Paints the image with the current color.



## Picking Colors from the Screen

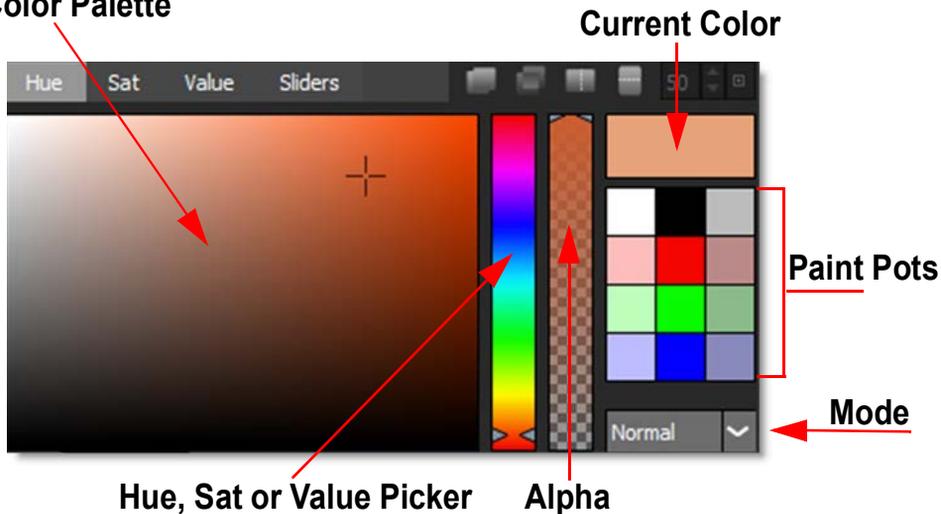
Colors can be picked off of the screen using a couple of different techniques.

- 1 **Hover over an area in the Viewer and press the `.` (period key). The area inside the brush diameter is sampled and averaged when choosing the color.**
- 2 **Right-click picks a color from a single pixel.**
- 3 **Right-click-drag and drawing a box averages the colors within it.**

## Color Palette

Colors can be selected using the Color Palette.

### Color Palette



The Hue, Sat, Value and Sliders tabs provide you with four different methods for selecting a color.

### Hue

The hue is selected from the hue picker while the saturation and value are chosen from the large square color palette.

## Sat

The saturation is selected from the saturation picker while the hue and value are chosen from the large square color palette.

## Value

The value is selected from the value picker while the hue and saturation are chosen from the large square color palette.

## Sliders

Use the Red, Green, Blue, Hue, Sat, Value and Alpha sliders to set a color.

## Hue, Sat or Value Picker

Depending on which tab is selected in the Color Palette, the vertical color bar to the right of the Color Palette controls the hue, saturation or value of the selected color.

## Alpha

The second vertical color bar slider to the right of the Color Palette controls the level of the painted alpha when Paint > A (alpha) is selected. An alpha value of 0 paints black, a value of 100 paints white, while a value in between paints a level of gray.

## Current Color

Displays the currently selected color.

## Mode

Selects how color is applied to the image.

## Normal

The Current Color is added to the image.

## Tint

The Current Color is used to tint the image by replacing hue and saturation.

## Hue

The Current Color is used to tint the image by only replacing hue.

## Luminance

Replaces the luminance of the image while leaving hue and saturation unaffected.

## Lighten

Pixels darker than the paint color are replaced, and pixels lighter than the paint color do not change.

## Darken

Pixels lighter than the paint color are replaced, and pixels darker than the paint color do not change.

## Paint Pots

Favorite colors can be stored in the paint pots by dragging and dropping from the Current Color. Click on one of the paint pots to make it the current color.

## Color Correct (Alt-C)

The image is painted using color adjustments.



## Hue

Rotates the hue.

## Saturation

Adjusts saturation. Positive values saturate, negative values desaturate.

## Brightness

Adjusts brightness. Positive values brighten, negative values darken.

## Contrast

Adjusts contrast. Positive values increase contrast, negative values decrease contrast.

## Center

Adjusts the contrast curve to weigh it more towards shadows or highlights. A lower value means a brighter range.

## Gamma

Adjusts gamma. The gamma adjustment leaves the white and black points the same and only modifies the values in-between. Positive values darken the midtones, negative values lighten the midtones.

## Red

Adds or subtracts red.

## Green

Adds or subtracts green.

## Blue

Adds or subtracts blue.

## Cutout (Alt-Shift-C)

Cuts out a portion of the image based on a rectangular selection, taking into account alpha if it exists, and paints using the cutout.



If one is not defined, you can click-drag to create a source region. When a source region already exists, press **Shift** to display it and then optionally drag to create a new one. The source region can be reset by **Shift**-clicking or right-clicking without dragging.

### Cutout Keyboard Shortcuts

<b>Shortcut</b>	<b>Action</b>
Click-drag	Creates a source region when none exists
<b>Shift</b> -drag or Right-click-drag	Creates a new source region
<b>Shift</b>	Displays source region
<b>Shift</b> -click or Right-click	Resets source region
<b>Ctrl/Cmd</b> -drag boundary	Scales the cutout
<b>Ctrl/Cmd-Shift</b> -drag boundary	Rotates the cutout

### Type

#### **RGBA**

Creates a cutout based on the RGBA channels.

#### **RGB**

Creates a cutout based on the RGB channels.

## Scale

Scales the cutout.

## Rotation

Rotates the cutout.

## Detail (Alt-D)

Sharpens or smooths by decomposing the image into coarse, medium and fine detail layers. This results in selective sharpening, detail enhancement and edge aware smoothing.



### Coarse

Adjusts the coarse detail layer. Increasing the value sharpens while decreasing the value smooths.

### Medium

Adjusts the medium detail layer. Increasing the value sharpens while decreasing the value smooths.

### Fine

Adjusts the fine detail layer. Increasing the value sharpens while decreasing the value smooths.

### Gang

The Coarse, Medium and Fine values can be ganged together. When ganged, adjust the Coarse slider to affect all values simultaneously. This will generate an overall sharpening effect if the numeric fields are increased and an overall smoothing effect if decreased.

### Range

#### Shadows, Midtones, Highlights, Full

Targets the Detail operation to either shadows, midtones or highlights as well as the entire range when set to Full.

## Dodge (Alt-Shift-D)

Lighten areas in the image.



### Exposure

Sets the brightness of the brush.

### Range

#### Shadows, Midtones, Highlights, Full

Targets the Dodge operation to either shadows, midtones or highlights as well as the entire range when set to Full.

## Drag (D)

Smudge or smear an area of the image. When the brush first starts, it makes a copy of the area under the brush, then on subsequent samples it stamps that area down in the new location with a blend.



### Mix

Mix is the initial blend amount of the smudged area.

### Decay

Determines how much of the Mix to use on the next stamp and reduces the Mix percentage with each sample.

The defaults are Mix = 50% and Decay = 90%. So, the first stamp will be a 50/50 mix of the brush start sample and the new sample, then the next will be 50% \* 90% of it, etc. until it eventually fades away entirely.

## Eraser (Shift-E)

Erases previously painted brush strokes.



## Grain (G)

Paints grain onto the image.



### Size

Sets the size of the grain.

### Red Size

Controls the size of the red grain.

### Green Size

Controls the size of the green grain.

### Blue Size

Controls the size of the blue grain.

### Amount

Sets the intensity of the grain.

### Red Amount

Controls the intensity of the red grain.

### Green Amount

Controls the intensity of the green grain.

### Blue Amount

Controls the intensity of the blue grain.

### Softness

Sets the softness of the grain.

### Red Softness

Controls the softness of the red grain.

### Green Softness

Controls the softness of the green grain.

### Blue Softness

Controls the softness of the blue grain.

## Monochrome

When enabled, the grain is monochrome. In this mode, parameters that have no effect are grayed out.

## Mosaic (M)

Divides the picture up into square tiles.



## Size

Controls the size of the square tiles. A small size value will create many square tiles.

## Repair (R)

Paints the image with the color level sampled at the beginning of each stroke.



## Scatter (Shift-S)

Scatters pixels in a random fashion.



## Radius

Sets the amount of scattering.

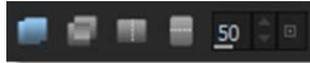
## Stroke (S)

Displays all strokes. Strokes can be selected by clicking or drag selecting in the Viewer. Hold **Shift** to add to the selection and **Ctrl** to toggle the selection. As strokes are selected, they are highlighted in the Viewer and the Paint History.



## Brush Compare Modes

Four brush compare modes preview brush settings prior to painting. You can choose from Onion Skin, Align, Vertical Split and Horizontal Split.



The **Caps Lock** key toggles the compare modes on and off.

**Note:** The compare modes are not available for the Drag, Repair, and Cutout brushes. Onion Skin and Align mode only work with the Clone brush.

### Onion Skin

Onion Skin does a mix, as defined by the Mix value, between the brush preview and source image. When using the Clone brush, it is a mix between the clone source and target. A value of 100 displays the clone source while a value of 0 displays the clone target.

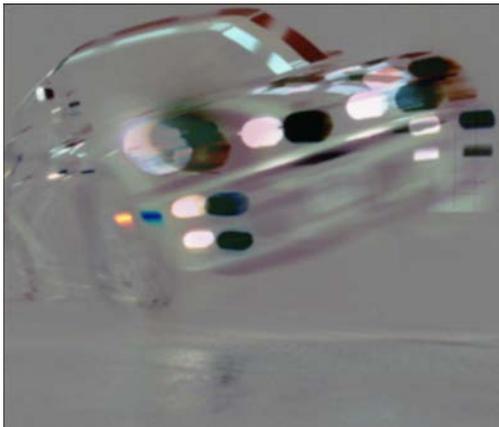


### Align

Align inverts the clone source and mixes it with the foreground, creating an embossed effect when similar images are not aligned. When perfectly aligned, the Viewer appears gray or black depending on the state of the Paint > Clone > Alignment Type preference.



Not Aligned



Aligned



## Vertical Split

Compares the brush preview and source image using a Vertical Split. Move your cursor into the image area over the split line and when the cursor changes to a double-arrow, click and drag to move the split line. The split line may not be obvious, so white triangles on the edges of the Viewer will help you find it.



The split is useful for determining the brush settings prior to painting.

**Note:** The | key (vertical bar) keyboard shortcut snaps the vertical split position to the cursor position.

## Horizontal Split

Compares the brush preview and source image using a Horizontal Split. Move your cursor into the image area over the split line and when the cursor changes to a double-arrow, click and drag to move the split line. The split line may not be obvious, so white triangles on the edges of the Viewer will help you find it.

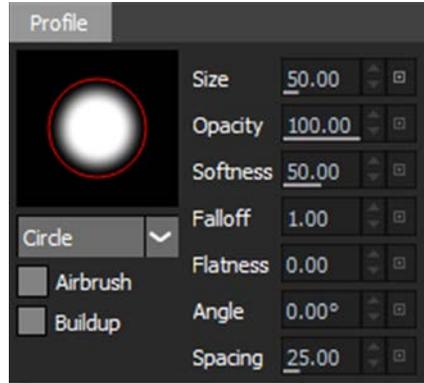


The split is useful for determining the brush settings prior to painting.

**Note:** The | key (vertical bar) keyboard shortcut snaps the horizontal split position to the cursor position.

## Profile

You can customize your brush settings in the Profile tab.



### Profile

A circle or square brush can be selected from the pop-up menu.

### Circle

The brush profile is set to a circle.

### Square

The brush profile is set to a square.

### Airbrush

When on, brush samples are generated at 30 samples/sec as long as the mouse button or pen is held down.

### Buildup

Allows the opacity to accumulate so it doesn't get clamped by the Opacity parameter value.

### Size

Sets the size of the brush. The brush can also be resized in the Viewer with the bracket keys, [ and ], or by holding **Ctrl/Cmd** and dragging the brush outline.

### Opacity

Sets the opacity or transparency of the brush.

## Softness

Sets the brush softness. The brush softness can be changed in the Viewer by holding **Ctrl/Cmd-Shift** and dragging the brush outline.

## Falloff

Controls the feather contour of the brush.

## Flatness

Sets the flatness of the brush.

## Angle

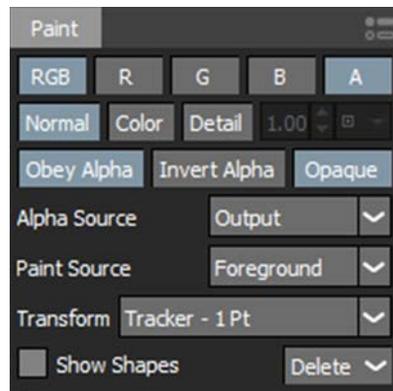
Sets the angle of the brush.

## Spacing

Sets the brush spacing.

## Paint

The Paint tab contains controls that affect how paint is applied to the image.



## RGB

The selected brush paints on the RGB channels.

## R

The selected brush paints on the red channel.

## G

The selected brush paints on the green channel.

## B

The selected brush paints on the blue channel.

## A

The selected brush paints on the alpha channel.

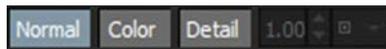
## Detail Separation

Separates the image into color and detail layers. The color and detail layers can be painted separately or simultaneously. Painting on the color layer preserves detail while painting on the detail layer preserves color.

**Note:** With the exception of Cutout and Eraser, all brushes can be used in the Color and Detail modes.

### Normal

Paints on the color and detail layers simultaneously.



### Color

Paints on the color layer. The color layer can be viewed by selecting View > Color Layer or pressing the **8** keyboard shortcut.



### Detail

Paints the detail layer. The detail layer can be viewed by selecting View > Detail Layer or pressing the **9** keyboard shortcut.

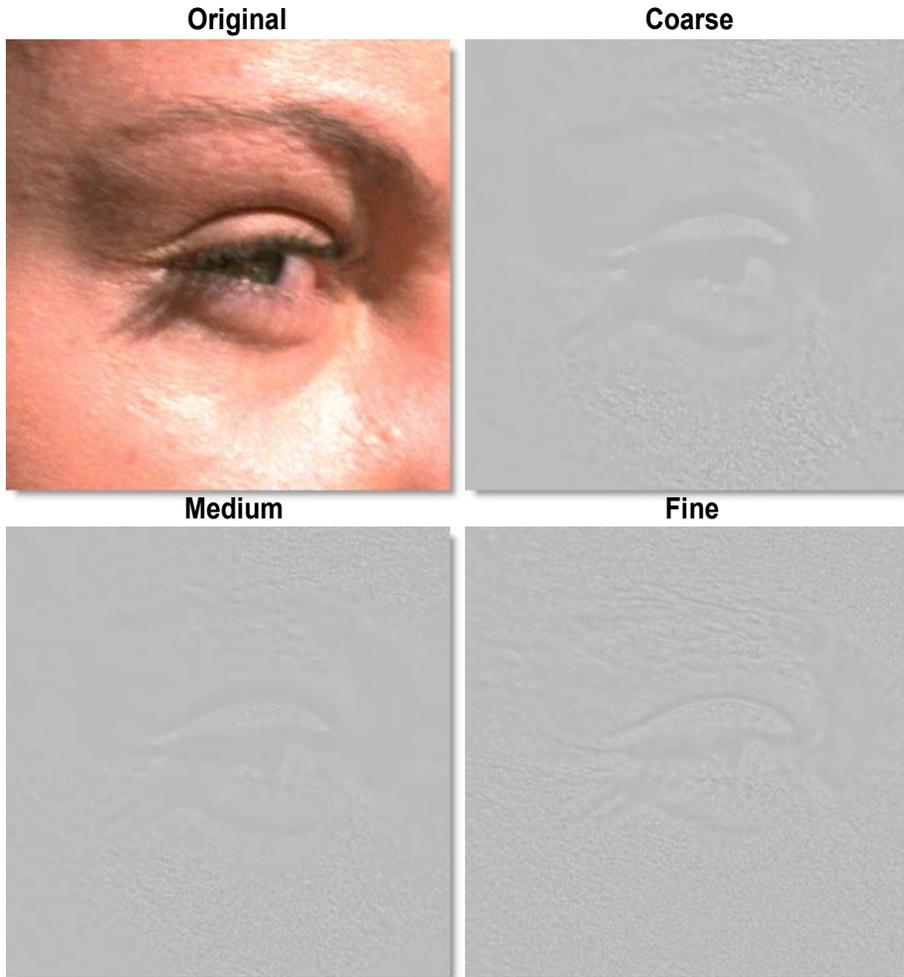


### Detail Level

Determines the detail layer to be used. 0 is coarse, .5 is medium and 1 is fine.

## Detail Preset

The pop-up menu to the right of Detail Level provides coarse, medium and fine detail presets.



### Coarse

Presets the detail to the coarse layer.

### Medium

Presets the detail to the medium layer.

### Fine

Presets the detail to the fine layer. The fine layer typically includes details such as skin blemishes, pores, hair, and wrinkles.

## Alpha

### Obey Alpha

When enabled, the intensity of the alpha channel controls how much the image will be affected by a particular paint operation. At any given pixel in the image, the more transparent the value in the alpha channel, the more transparent the application of the paint operation.

### Invert Alpha

Inverts the alpha channel used for the Obey operation.

### Opaque

Enabled once the **A** button is turned on, the Opaque control ensures that a solid paint stroke is created when painting into the alpha channel. When Opaque is off, the brush will also affect the alpha channel. So, it's possible to blur and drag the alpha channel, for instance.

### Alpha Source

Selects which input source to use when Obey is enabled.

### Foreground, Input 1-2

#### Foreground

Obeys the alpha from the Foreground input or the Roto node's shapes.

#### Input 1-2

Obeys the alpha from the Clone sources.

#### Output

Uses Paint's output alpha as the obey alpha source. This option is handy for painting temporary alpha to control where you paint in the RGB channels.

### Paint Source

Selects either Foreground or Output as the paint source. **Alt-S** toggles between Foreground and Output.

#### Foreground

The brush paints from the Foreground. For instance, this is useful for painting multiple strokes to perform a constant color correction or blur adjustment.

## Output

The brush paints from the Output, with each new stroke affecting what was previously painted.

**Note:** Paint Source is not available for the following brushes: Clone, Cutout, Mosaic, Repair and Scatter.

## Transform

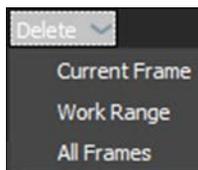
Selects tracked layers from the Tracker, for use in match moving paint strokes or the clone source during event playback.

## Show Shapes

Shape outlines from Roto can be displayed in Paint

## Delete

Delete all paint strokes and restores the original unpainted frames.



### Current Frame

Sets the range to the current frame.

### Work Range

Sets the range to the in and out points in the Timebar.

### All Frames

Sets the range to the entire frame range.

## Paint Preferences

Seldom adjusted Paint controls can be accessed by clicking the Paint Preferences icon.

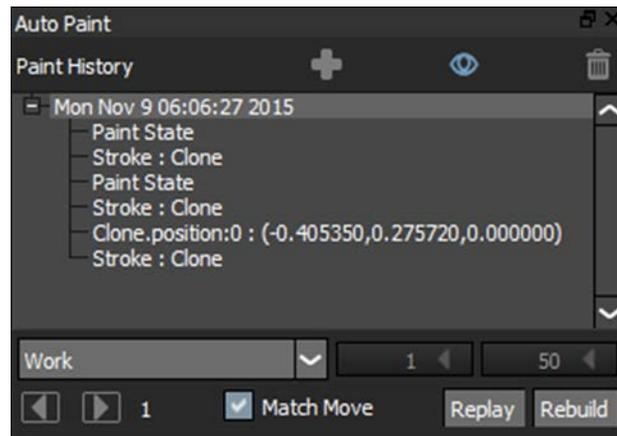


## Auto Paint

Auto Paint is a highly unique automated paint feature that records all paint activity with tight integration of both point and planar trackers. Paint strokes can be match moved or stabilized giving Silhouette the speed of raster paint with the repeatability of vector paint. The beauty of the system lies in the automatic recording of the paint strokes and brush settings. Individual paint strokes can be selected and repeated over many frames, as well as deleted. If the original footage changes, the entire paint history can be used to rebuild the painted shot automatically. Go to the [Auto Paint](#) tutorial to see how it works.

## Paint History

The Paint History contains all of the “events” for the current session. Events are things like paint strokes, brush profile changes, brush parameter changes, other paint states, etc. A selection of events essentially becomes a macro and can be played back over a range of frames.



Groups are created each time painting is started on a frame and are recorded with the current time stamp. So the first time you begin painting on frame 1, for instance, a renameable “event group” containing a current time stamp is created. Then, events are created for the current paint state: channels/flags, brush, brush profile, and brush parameters. And finally, a new stroke event is created for the new stroke. After the first stroke, state changes are stored in their own events (ie. brush size, opacity, etc).

## Add Group

Manually adds a paint event group. Manually creating groups is useful for organizing your painted strokes so that they can easily be identified at a later time.



**Note:** Normally, one paint group is created while painting on a frame. If you leave the frame and come back to it later, another group will be created automatically.

## Show Strokes

When you make a selection in the Paint History, the strokes are highlighted green in the Viewer when Show Strokes is enabled--the default.



## Delete

Press the **Delete** icon or the **Delete** key to delete selected events.



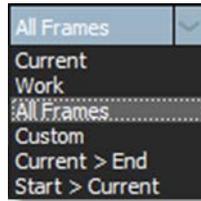
## Groups and Events

- A date and time stamp is an automatically created group that contains the events for frame 1. Later, if you leave and come back to frame 1, there will be a new group created with a new time stamp. This will keep track of what changes were made and when.
- Groups can be renamed by double-clicking, typing a new name and hitting Enter.
- The first time you do something on a frame, events that snapshot the current paint state are recorded. This is so that if you need to rebuild the frame, everything that is needed is in the Paint History for each frame.
- Groups that have + icons indicate you can expand them to see their contents.

## Event Playback

### Frame Range

Defines the frame range for Event Playback and Rebuild operations.



#### Current

Sets the range to the current frame.

#### Work

Sets the range to the in and out points in the Timebar.

#### All Frames

Sets the range to the entire frame range.

#### Custom

Sets a custom range as defined by the numeric entry fields. To quickly set custom in/out points, press the arrows in the numeric fields to enter the currently parked frame.

#### Start>Current

Sets the range to the start frame ending at the current frame.

#### Current>End

Sets the range to the current frame ending at the end frame.

### Play Selected Events Forward/Backward

Plays selected events in the Paint History either forward or backward.

In the Paint History window, select the paint event group or a sub set of the paint events you want to play back. You will see the strokes highlight green in the Viewer. Then, select the desired frame range and press either the Play Selected Events Forward or Backward icon.



The number to the right of the Play Selected Events icons represents the number of selected items in the Paint History.



If a layer with tracking data applied is selected and Match Move is enabled, the selected strokes will be match moved when played back.

**Note:** To Match Move the clone source during playback, you will need to select the layer and enable Clone > Match Move prior to painting.

## Match Move

Match Move allows you to apply the selected tracked layer while playing back paint events.

## Duplicate

Duplicates strokes from one view to another for the current frame. If a layer with a stereo offset is selected prior to duplicating, the stereo offset is taken into account when duplicating the strokes.

**Note:** Duplicate only appears when in a stereo project.

## Replay (Ctrl/Cmd-Alt-R)

Replays the last stroke. This can be used to apply the last stroke with changed settings and/or on a different frame.

## Rebuild

Rebuilds the paint events for all frames defined in the Frame Range in the order in which they were painted. This is useful if you replace your footage with a different color correction than the original and want the result of painting with the Clone brush to match the new footage.

## Paint Brush Shortcuts

<b>Shortcut</b>	<b>Action</b>
<b>B</b>	Selects the Black and White brush
<b>Shift-B</b>	Selects the Blemish brush
<b>Ctrl/Cmd-B</b>	Selects the Blur brush
<b>Alt-Shift-B</b>	Selects the Burn brush
<b>C</b>	Selects the Clone brush
<b>Shift-C</b>	Selects the Color brush
<b>Alt-C</b>	Selects the Color Correct brush
<b>Alt-Shift-C</b>	Selects the Cutout brush
<b>Alt-D</b>	Selects the Detail brush
<b>Alt-Shift-D</b>	Selects the Dodge brush
<b>D</b>	Selects the Drag brush
<b>Shift-E</b>	Selects the Eraser brush
<b>G</b>	Selects the Grain brush
<b>M</b>	Selects the Mosaic brush
<b>R</b>	Selects the Repair brush
<b>Shift-S</b>	Selects the Scatter brush
<b>S</b>	Selects the Stroke tool

## Paint Settings Shortcuts

<b>Shortcut</b>	<b>Action</b>
<b>Ctrl/Cmd</b> -drag left/right	Sizes the brush
[ and ]	Sizes the brush
<b>Ctrl/Cmd-Shift</b> -drag	Sets the brush softness
<b>Shift-Alt-1</b> and <b>Shift-Alt-2</b>	Selects the Dual Clone brush setups
<b>Shift+Ctrl+1</b>	Toggle Dual Clone mode on/off
' (located to the left of <b>1</b> key)	Displays the Clone source and then the Clone target so that you can click on each to set the Clone offset
<b>Caps Lock</b>	Toggles Onion Skin mode on and off
▪ (period key)	Picks colors off of the screen
Right-click	Picks a color off of the screen from a single pixel
Right-click-drag	Picks a color off of the screen by drawing a box and averages the colors within it
<b>Alt</b> -click-click	Draws a straight line
<b>Alt-S</b>	Toggles between Paint Source > Foreground or Output
key (vertical bar)	Snaps the vertical or horizontal split compare position to the cursor position

## Paint View Menu

<b>Shortcut</b>	<b>Action</b>
1	View the Output
2	View the Foreground
3-7	View Input's 1-5
8	View Color Layer
9	View Detail Layer
P	View Paint Only

# ROTO

## Roto

### Description

Rotoscoping or “Roto” for short has become a generic term for drawing shapes to extract, isolate or affect a portion of an image. It is tedious work, but it’s one of the most important parts of the visual effects process. Within Roto, there are all the tools needed to make quick work of any roto job.

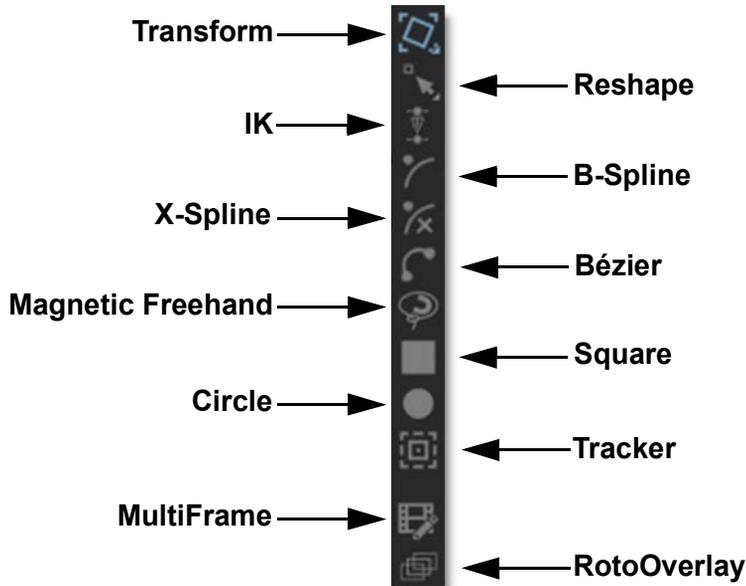
The Roto node is where you create shapes and trackers to be used in Paint for tracking paint strokes as well as holdout mattes for painting.

**Note:** The shapes from the Silhouette Paint plug-in can’t be exported or rendered.

Go to the [Roto](#) tutorials to see how it works.

### Toolbar

When Roto is selected, a number of different tools are selectable from the Toolbar to the left of the Viewer.



## Toolbar Keyboard Shortcuts

<b>Shortcut</b>	<b>Action</b>
<b>T</b>	Selects Transform Shape Mode
<b>TT</b>	Selects Transform Points Mode
<b>R</b>	Selects Reshape Normal Mode
<b>RR</b>	Selects Reshape Magnet Mode
<b>Y</b>	Selects IK (Inverse Kinematics)
<b>B</b>	Selects B-Spline
<b>S</b>	Selects X-Spline
<b>Shift-B</b>	Selects Bézier
<b>Shift-F</b>	Selects Magnetic Freehand
<b>Shift-S</b>	Selects Square
<b>Shift-C</b>	Selects Circle
<b>Shift-T</b>	Selects Tracker
<b>M</b>	Selects MultiFrame
<b>Shift-O</b>	Selects RotoOverlay
<b>Alt-F</b>	Toggles the shape feather handle on/off
<b>Alt-K</b>	Adds weighted keyframe

## Bézier (Shift-B)

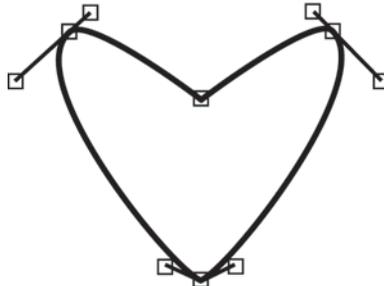
Creates a Bézier spline.



Go to the [Bézier](#) tutorial to see how it works.

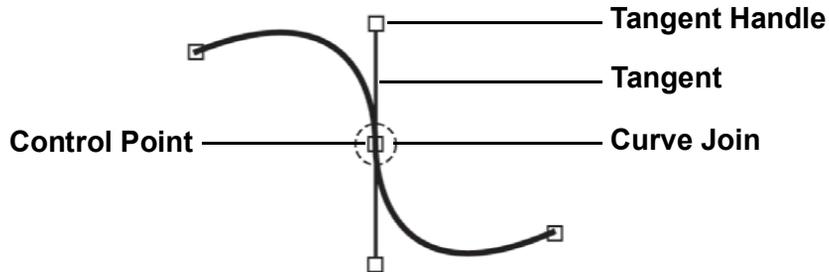
To draw a Bézier spline, click on the image to place the first control point and drag the cursor while keeping the mouse pressed to extend the control point's tangents. Click on the screen to add more control points and when finished adding points, click the first control point that you added to close the shape.

To create an open shape, add points and press the **Esc** key or switch to a different tool to finish the shape. Then in the Reshape tool, select the open shape, adjust the Stroke Width to set its thickness and choose either a flat or round Cap Style in the Object Parameters.



Originally developed by Pierre Bézier in the 1970's for CAD/CAM operations, Bézier splines became the foundation of the entire Adobe drawing model. If you're a user of Adobe products, you've probably used Bézier's. Bézier splines are defined by control points and tangents. The position of the two tangent handles control the amount of a point's curvature.

A shape is created by drawing a Bézier curve path. This path contains control points and tangents that define the form of the curve.

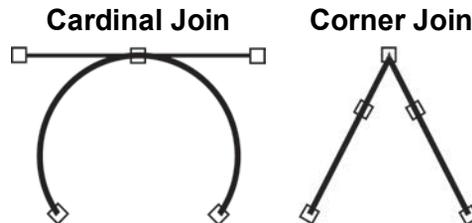


## Control Points

Control points are locations on the curve that determine its shape. When a control point is selected, two tangents extend from the control point. These tangents guide the shape of the curve.

## Joins

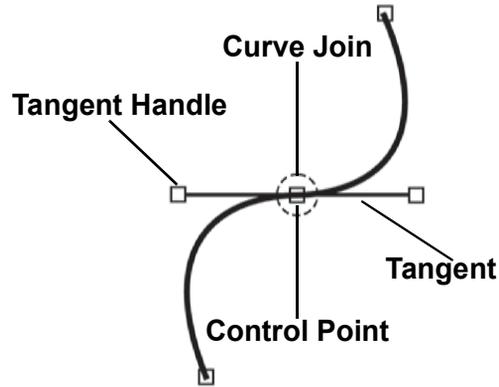
The area of the curve at the control point is called the curve join.



Joins can either be corner or cardinal (smooth) joins. When control point tangents are positioned in opposite directions, the join is cardinal. In contrast, corner joins have their tangents positioned at an angle to each other.

## Adjusting Bézier Curves

The length and direction of a control point's tangents direct the curve through that control point.



Control points have two tangents that can extend from it. The path of the curve through the control point is determined by the length and orientation of the tangents. When you drag one tangent's handle, the adjacent tangent moves as well. Using keyboard shortcuts while dragging allows you to control how the curve passes through a control point.

## Bézier Keyboard Shortcuts

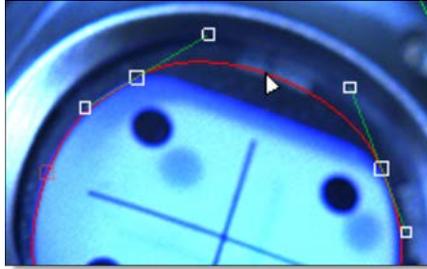
Shortcut	Action	Curve
No key needed	Adjust the length of one tangent while retaining a fixed angle between two tangents	
Ctrl/Cmd	Adjust both tangents simultaneously while retaining a fixed angle between two tangents	
Alt	Adjusts only one tangent to create corners	
Shift	Adjusts only the length of one tangent (similar to the “No key needed” shortcut)	
Ctrl/Cmd-Alt-1	Sets the point tension to Corner	
Ctrl/Cmd-Alt-2	Sets the point tension to Cardinal	

### Extending Short Tangents

Sometimes a control point's tangents are so close together that trying to modify the tangent results in movement of the control point. If this is the case, you can force the tangents to move without affecting the control point by pressing the **Alt** key while dragging the tangent. Only the tangent will move, leaving the control point unaffected.

## Moving Curve Segments

Normally, you move control points to adjust the form of a shape, but you can also move the portion of the curve between control points. To move a curve segment, deselect all control points by clicking somewhere off the shape and then **Ctrl/Cmd**-drag a curve segment between control points.



Once you start dragging, the **Ctrl/Cmd** key can be released.

**Note:** The surrounding tangents remain smooth, but if you want to keep adjacent tangents from moving, hold down the **Alt** key while dragging.

## B-Spline (B)

Creates a B-Spline shape.



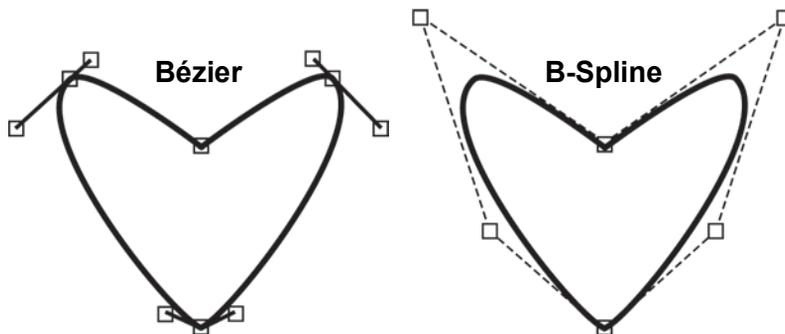
Go to the [B-Spline](#) tutorial to see how it works.

To create a B-Spline, click on the screen to create a control point and add as many points as you like. When you are finished adding points, click the first control point that you added to close the shape.

To create an open shape, add points and press the **Esc** key or switch to a different tool to finish the shape. Then in the Reshape tool, select the open shape, adjust the Stroke Width to set its thickness and choose either a flat or round Cap Style in the Object Parameters.

In contrast to Béziers, B-Splines don't use tangents and are created by only using control points. The position of the points, their tension settings as well as their proximity to each other determine the curvature of the shape. B-Splines are somewhat similar to NURBS (non-uniform rational B-Splines) that are used in many 3D modeling packages.

The images below show how the same shape can be created with either Béziers or B-Splines.



Because the two spline types have significant strengths and differences, artists are religiously loyal to one or the other. B-Splines create natural curves but are terribly inefficient at defining square corners and require more points to define than a similar Bézier shape. On the other hand, Béziers can easily create corners and use fewer points, but can have an unnatural curved path

caused by overly malleable “split” handles. Depending upon your expertise, you may find Bézier splines are more appropriate for square and angular shapes while B-Splines will work better for objects with a lot of curves like a person’s face. Just to upset the status quo, there is a new kid on the block called X-Splines which is explained in the next section. This spline type brings together the best of both B-Splines and Béziars.

## Adjusting B-Splines

In contrast to Béziars, B-Splines don’t use tangents and are created by only using control points and are simple to adjust. The position of the points, their weight settings as well as their proximity to each other determine the curvature of the shape. The weight (amount of pull on a point) decides how sharp or smooth it is. Silhouette employs variable weight intensities on a point by point basis. The weight can be adjusted by hovering over a point and **Alt**-dragging to the right to create a corner point or **Alt**-dragging to the left to create a smooth point. Alternatively, you can **Alt**-click on one of the selected points to cycle through the preset weight settings.

**Note:** Do not use extreme, variable weight adjustments if you are planning on converting the B-Spline to a Bézier Spline.

## B-Spline Keyboard Shortcuts

<u>Shortcut</u>	<u>Action</u>
<b>Alt</b> -drag control point right	Creates a corner point
<b>Alt</b> -drag control point left	Creates a smooth point
<b>Alt</b> -clicking control point	Cycles through the preset weight settings of the point
<b>Ctrl/Cmd-Alt-1</b>	Sets the point tension to Corner
<b>Ctrl/Cmd-Alt-3</b>	Sets the point tension to B-Spline

**Note:** The **Alt**-click and pop-up menu preset weight settings for Corner and B-Spline can’t be animated.

## X-Spline (S)

Creates a X-Spline shape.



Go to the [X-Spline](#) tutorial to see how it works.

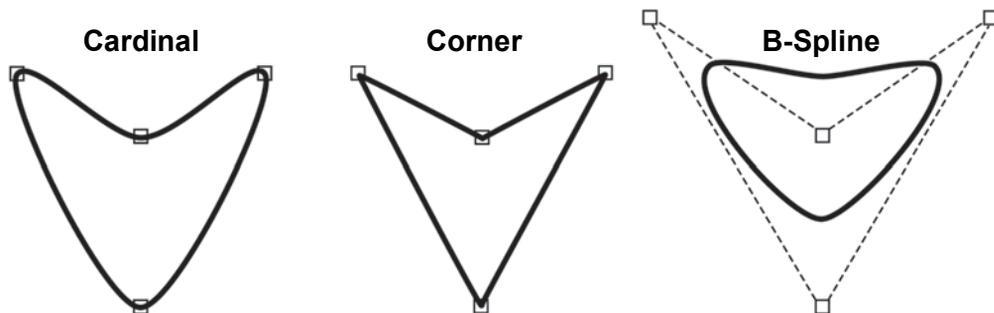
To create a X-Spline, click on the screen to create a control point and add as many points as you like. When you are finished adding points, click the first control point that you added to close the shape.

To create an open shape, add points and press the **Esc** key or switch to a different tool to finish the shape. Then in the Reshape tool, select the open shape, adjust the Stroke Width to set its thickness and choose either a flat or round Cap Style in the Object Parameters.

A X-Spline is an intuitive and easily editable spline format whereby its points can be of three different types: Cardinal, Corner or B-Spline.

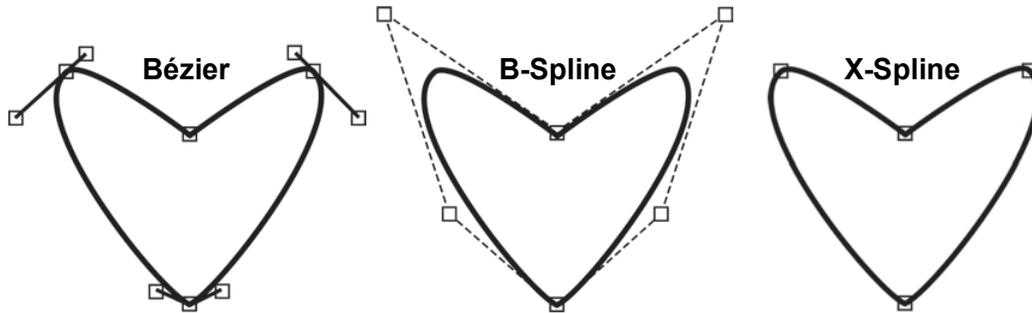
- **Cardinal** creates a path that passes smoothly through each point.
- **Corner** makes a path that consists of angular corner points.
- **B-Spline** creates a smooth path that is determined by the surrounding points.

Look at how the same set of points can yield entirely different shapes based on the point type setting.



The point type can be changed at anytime as well as animated from one type to another. You'll find that the beauty of X-Splines is that the shape's points can be a mix of Cardinal, Corner or B-Splines.

The images below show how the same shape can be created with either Bézier splines, B-Splines or X-Splines.



## Adjusting X-Splines

X-Splines are created by using control points and then adjusting their weight to coincide with one of the point types: Cardinal, Corner or B-Spline. The point type can even be somewhere in between one point type and another. The weight can be adjusted by hovering over a selected point and **Alt**-dragging to the right. The weight of the point goes from Cardinal to Corner to B-Spline. Alternatively, you can **Alt**-click to cycle through the different point types.

## Edge Snapping

You can snap the control points of an X-Spline to edges of an object by using the Edge Snapping tool. Select the points you want to move and press the **Alt-S** key.

Alternatively, start dragging the points, hold the **Alt-S** key down and they will snap to the nearest detectable edge. In some cases, the points may not snap to where you want them to. If this happens, adjust the points manually.

## X-Spline Keyboard Shortcuts

<b>Shortcut</b>	<b>Action</b>
<b>Alt-drag</b> control point right	Adjusts the weight of the point from Cardinal to Corner to B-Spline
<b>Alt-drag</b> control point left	When the weight is set to B-Spline, it adjusts the weight of the point from B-Spline to Corner to Cardinal
<b>Alt-clicking</b> control point	Cycles through preset weight settings of the point
<b>Ctrl/Cmd-Alt-1</b>	Sets the point tension to Corner
<b>Ctrl/Cmd-Alt-2</b>	Sets the point tension to Cardinal
<b>Ctrl/Cmd-Alt-3</b>	Sets the point tension to B-Spline
<b>Alt-S</b>	Snap selected control points to the nearest detectable edge
<b>Drag Points-Hold Alt-S</b>	Snap selected control points to the nearest detectable edge

## Magnetic Freehand (Shift-F)

Creates freehand shapes with or without magnetic properties. A magnetic freehand shape snaps the shape boundary to the nearest object edge.



Go to the [Magnetic Freehand](#) tutorial to see how it works.

### Magnetic Shape

Creates a freehand shape with magnetic properties. There are two methods of creating a magnetic shape: Tracing or Strokes.

#### Tracing

Click once near the edge you want to start with and move your cursor along the edge you want to follow. The shape boundary snaps to the nearest edge to where the cursor lies, tracing the shortest path from any previous click. When you are done tracing, click the first control point that you added to close the shape.

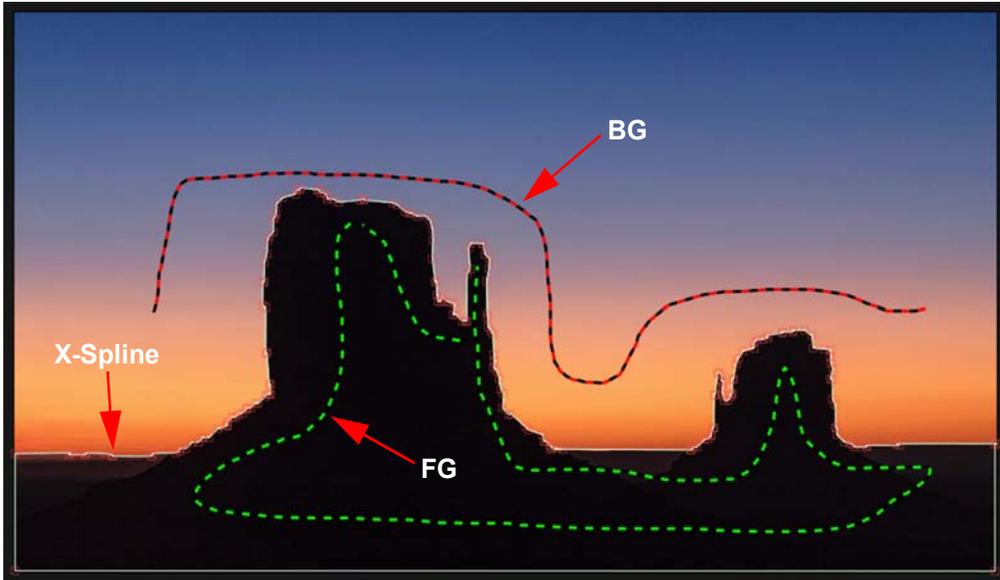


#### Magnetic Tracing Shortcuts

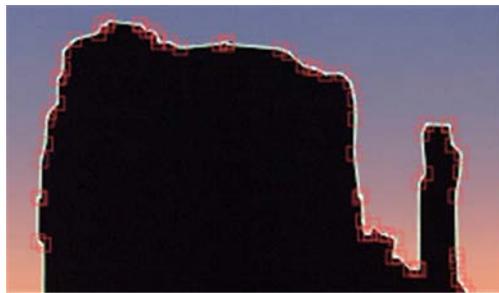
<u>Shortcut</u>	<u>Action</u>
<b>Click while tracing</b>	Anchors the currently drawn path by adding a shape point
<b>Shift-click</b>	Draws a straight line between the new and previous shape points

## Strokes

Temporary foreground (inside the shape) and background (outside the shape) strokes are drawn for the object you want to create a shape around. **Shift**-click and drag to create foreground strokes. With each click and drag of the mouse, a green line is drawn. **Alt**-click and drag to create background strokes. With each click and drag of the mouse, a red line is drawn.



As soon as the first background stroke is drawn, an X-Spline is created around the object.



Add additional foreground and background strokes as needed so that the shape properly surrounds the object.

Press **Esc** to clear the foreground and background strokes as well as deselect the current shape. You can now create a new magnetic shape or new foreground/background strokes.

### Magnetic Stroke Marking Shortcuts

<u>Shortcut</u>	<u>Action</u>
<b>Shift-click-drag</b>	Creates a foreground stroke
<b>Alt-click-drag</b>	Creates a background stroke
<b>Esc</b>	Clears foreground and background strokes / Deselects current shape

## Freehand Shape

Click and drag to create a freehand shape. A freehand shape is exactly like a magnetic shape, minus the magnetic properties. When you are done drawing, click the first control point that you added to close the shape.

**Note:** Anytime you press and hold the mouse down, a freehand shape is drawn.

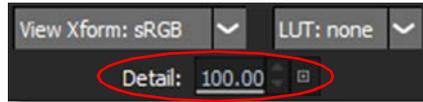
## Finalizing Magnetic and Freehand Shapes

When a magnetic or freehand shape is completed, an X-Spline that follows the originally drawn line is created.



## Adjusting Detail

X-Splines generated by the Magnetic Freehand tool have a fairly high point count to match the subtle changes in the line. To reduce the number of points, select an X-Spline in the Object List while in the Magnetic Freehand tool and adjust the Detail parameter directly above the Viewer.



Adjusting the Detail reduces points for X-Splines created with the Magnetic Freehand tool, while increasing points for normal X-Splines.

## Square (Shift-S)

Creates a square or rectangular spline.



To create a Square, click and drag in the shape of a square and release the mouse.

Go to the [Square](#) tutorial to see how it works.

## Circle (Shift-C)

Creates a circular spline.



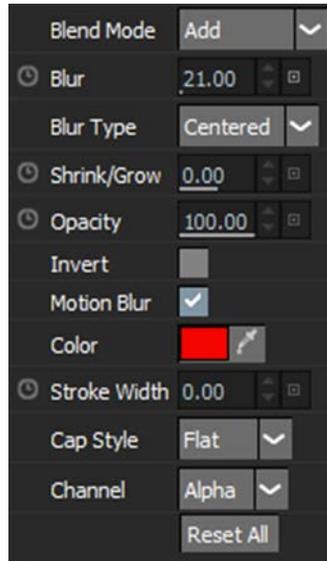
To create a Circle, click and drag in the shape of a circle and release the mouse.

Go to the [Circle](#) tutorial to see how it works.

## Shape and Layer Parameters

### Shape Parameters

All of the editable parameters of a shape can be adjusted in the Object Parameters. When a shape is selected, you will see the parameters listed below.



### Blend Mode

Controls how objects are blended together.

#### Add

Adds the object to other objects.

#### Subtract

Subtracts the object from other objects.

#### Multiply

Produces a result where there is a union of pixels from two objects.

#### Difference

Produces a result where a value exists in each object, but not in both.

## Max

Looks at the luminance information for each object and selects the value—whichever is brighter—as the result. Darker pixels are replaced while brighter pixels do not change.

## Inside

Places the object inside the alpha generated by the objects below it.

## Blur

Sets the blur level of the selected shape or shapes. The Blur range is from 0-100 and defaults to 0.

## Blur Type

Determines the type of blur.

- **Centered**

The blur is centered on the edge of the shape, equally blurring inward and outward.

- **Inner**

The shape is blurred inward from the edge of the shape.

- **Outer**

The shape is blurred outward from the edge of the shape.

## Shrink/Grow

Shrinks or grows the shape's alpha channel. Negative values shrink and positive values grow.

## Opacity

Sets the opacity of the selected shape. The opacity range is from 0-100 and defaults to 100. The interpolation type is set to Hold by default making it easy to turn shapes on and off at particular frames.

**Note:** You can change the Opacity interpolation type from Hold to Linear at any time. To do so, select the shape's Opacity keyframes in the Timeline, right-click and select Interpolation > Linear.

## Invert

Inverts the shape values. The default is off.

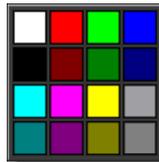
## Motion Blur

Motion blur is the directional blurring of rapidly moving shapes. This parameter turns motion blur on or off for the selected shape or shapes. The default is off. To affect a shape, Motion Blur also needs to be enabled in the Node window. See the **Motion Blur** section of the Roto Node parameters for more information.

**Note:** Normally, motion blur is calculated going forward, so if there is no shape motion beyond the end of a clip, there won't be motion blur on the last frame. To work around this, add an extra frame or two to the end of the work range in the Timebar and move the shape's last keyframe to be outside of the session range.

## Color

Sets the color of the shape outline. Left-clicking the color pot opens a standard color picker while right-clicking on the color pot opens a pop-up color menu with 16 primaries.



When the Roto node's Color > Enable parameter is on, this sets the color of the filled shape.

## Stroke Width

Sets the thickness of an open shape. When used on a closed shape, an outline is created.

## Cap Style

Sets the end cap style for open shapes. You can choose from Flat or Round styles.

## Channel

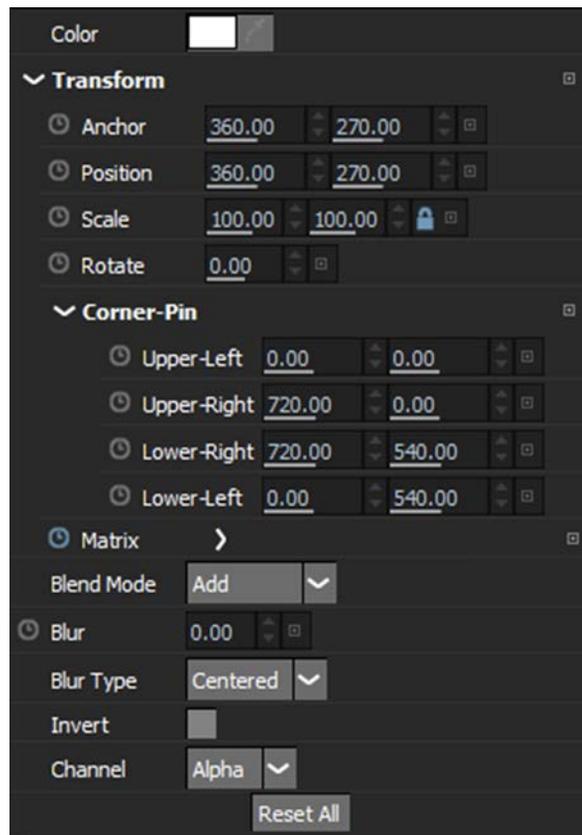
Determines what channel the shape is rendered into. You can set each shape to Red, Green, Blue, or Alpha. To visualize the results prior to rendering, use View > Channels in conjunction with the **Alt-R**, **G**, **B** and **A** shortcut keys. When ready, render shapes into the assigned channels with the Actions > Render Shapes to Channels action.

## Reset All

Resets all parameters to their default state.

## Layer Parameters

Layers are used to organize shapes, but more importantly they are used to contain the motion information from trackers. All of the editable parameters of a layer can be adjusted in the Object Parameters. When a layer is selected, you will see the parameters listed below. The Transform, Blend Mode, Blur and Invert state of a layer can be adjusted.



## Transform

The Position, Scale, Rotation, Corner-Pin and Anchor Point can be adjusted and animated.

## **Anchor**

Sets the anchor point for the layer transformation. Scaling and rotation operations center around the anchor point.

## **Position**

Sets the horizontal and vertical position of the layer.

## **Scale**

Sets the horizontal and vertical scale of the layer. Typing in a negative value will flip or flop the shapes in the layer.

## **Rotate**

Sets the rotation of the layer.

## **Corner-Pin**

The layer can be corner pinned by adjusting the Corner-Pin values.

### **Upper-Left**

Controls the X and Y position of the Upper Left Point.

### **Upper-Right**

Controls the X and Y position of the Upper Right Point.

### **Lower-Right**

Controls the X and Y position of the Lower Right Point.

### **Lower-Left**

Controls the X and Y position of the Lower Left Point.

## **Matrix**

When tracking data is applied to a layer, the Matrix parameter is used to store the tracker keyframes.

## **Blend Mode**

Controls how layers are blended together. See the [Blend Mode](#) section for more information.

## Blur

Sets the blur level of all shapes within the layer. The Blur range is from 0-100 and defaults to 0.

## Blur Type

Determines the type of blur.

- **Centered**

All shapes in the layer are blurred equally inward and outward centered on the edge of the shapes.

- **Inner**

All shapes in the layer are blurred inward from the edge of the shapes.

- **Outer**

All shapes in the layer are blurred outward from the edge of the shapes.

## Invert

Inverts all shapes within the layer. The default is off.

## Channel

Determines which channel the shapes in the layer are rendered into. You can set a layer to Red, Green, Blue, or Alpha. To visualize the results prior to rendering, use View > Channels in conjunction with the **Alt-R**, **G**, **B** and **A** shortcut keys.

## Reset All

Resets all parameters to their default state.

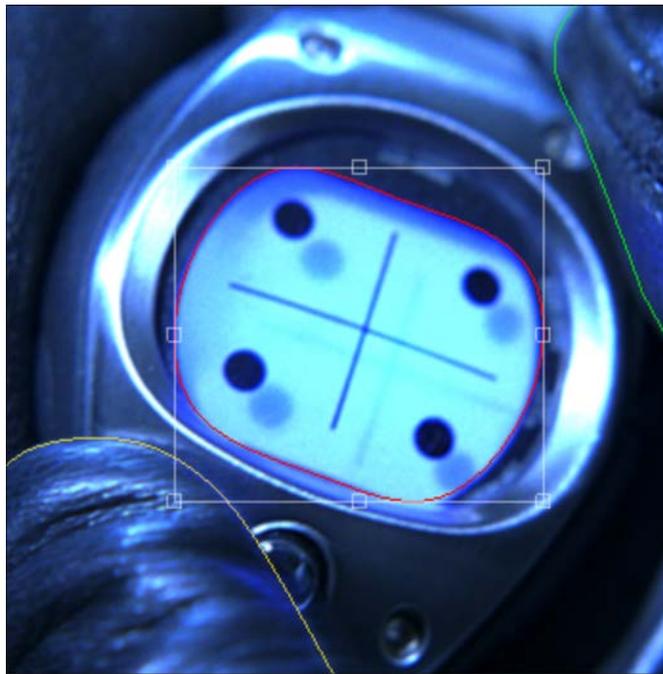
## Transform

Once you draw a shape, there are various ways to modify it. As the object that you are attempting to Roto changes over time, you will need to adjust the shape so that it exactly matches the object. While the Transform tool affects an entire shape or a group of shapes, you can use Reshape to modify individual points on a shape. See [Reshape](#) for more information.

Go to the [Transform](#) tutorial to see how it works.

### Transform - Shape Mode (T)

Transform Shape Mode allows you to position, move, scale, rotate, shear or corner-pin a shape or selection of shapes using the on-screen controls. To enter this mode, press either Transform in the Toolbar or the **T** key once. Then, select a shape and use the on-screen controls to modify it.



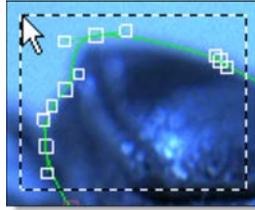
## Transform On-Screen Controls

<b>Shortcut</b>	<b>Action</b>
Drag shape	Moves the shape
<b>Shift</b> -drag shape	Constrain shape movement horizontally or vertically
Drag bounding box corner or edge handle	Scales a shape
<b>Shift</b> -drag bounding box corner or edge handle	Proportionally scale a shape
<b>Ctrl/Cmd</b> -drag on a bounding box corner handle	Rotate a shape
<b>Alt</b> -drag on a bounding box corner handle	Corner-pin a shape
<b>Alt-Shift</b> -drag on a bounding box corner handle	Constrains the corner-pin movement to one axis
<b>Ctrl/Cmd</b> -drag on a bounding box edge handle	Shear a shape
<b>.</b> (period key)	Turns the Anchor Point on or off
Drag on Anchor Point	Moves the Anchor Point
<b>Shift-.</b> (period key)	Moves the Anchor Point to the mouse location
<b>Q</b>	Activates / Deactivates translation of selected shapes or layers
<b>W</b>	Activates / Deactivates rotation of selected shapes or layers
<b>E</b>	Activates / Deactivates scaling of selected shapes or layers
<b>Q, W, E</b> then <b>Ctrl/Cmd</b>	Translates, Rotates or Scales in finer increments
<b>Ctrl/Cmd-W</b>	Rotates without setting the anchor point
<b>Ctrl/Cmd-E</b>	Scales without setting the anchor point

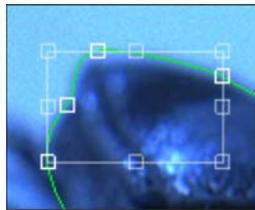
If there are any selected layers while in the Transform tool, pressing **Q**, **W** or **E** and then clicking and dragging will translate, rotate or scale the selected layers. If there are no selected layers, you must select a shape or group of shapes before clicking and dragging. Also, the position of the cursor when **W** or **E** is pressed sets the anchor point for the rotation or scale operation.

## Transform - Points Mode (TT)

Transform Points Mode allows you to position, move, scale, rotate, shear or corner-pin a selection of points using the on-screen controls. To utilize this mode, use Reshape to first select some points



and then press either Transform twice in the Toolbar or the **T** key twice.



Instead of a bounding box with on-screen controls around the shape, the bounding box is around the selected points.

## Moving Shapes

Selected shapes are moved using one of three methods:

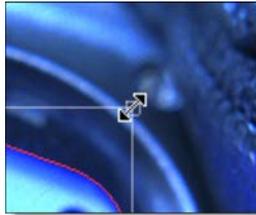
- 1** Drag on the outline of a shape.
- 2** Nudge the shapes using the arrow keys. See [Nudging](#) for more information.
- 3** Press the Q key to activate translation mode and click and drag to move the selected shapes. You must press the Q key a second time to deactivate translation mode.



In either case, you can constrain movement along an axis by pressing the **Shift** key while dragging the outline of a shape. The movement is constrained by the first direction (horizontal or vertical) that you drag in.

## Scaling Shapes

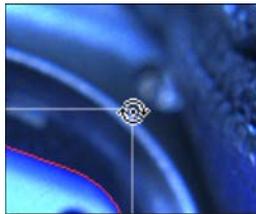
Scaling changes the size of the shapes. Selected shapes are scaled using one of two methods: 1) Drag any of the points on the shape bounding box or 2) Press the **E** key to activate scaling mode and click and drag to scale the selected shapes. You must press the **E** key a second time to deactivate scaling mode.



**Note:** The position of the cursor when **E** is pressed sets the anchor point for the scaling. To proportionately scale, hold down the **Shift** key when resizing.

## Rotating Shapes

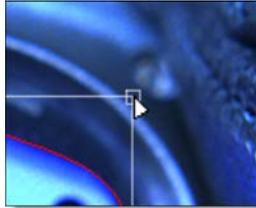
Rotating changes the angle of the shapes. Selected shapes are rotated using one of two methods: 1) **Ctrl/Cmd**-drag on a shape bounding box corner handle or 2) Press the **W** key to activate rotation mode and click and drag to rotate the selected shapes. You must press the **W** key a second time to deactivate rotation mode.



**Note:** The position of the cursor when **W** is pressed sets the anchor point for the rotation.

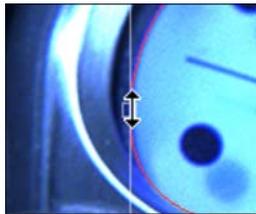
## Corner-Pinning Shapes

The corner points of a shape's bounding box can be corner-pinned. For instance, you could fit the corners of a shape into the corners of a billboard. **Alt**-drag the corners of the shape's bounding box to corner-pin the shape.



## Shearing Shapes

Shapes can be sheared resulting in the shape being skewed horizontally or vertically. To shear a shape, **Ctrl/Cmd**-drag on the midpoints of a shape bounding box on either the horizontal or vertical axis.



## Anchor Point

A shape rotates around its center point, but scales from the opposite handle. Moving the anchor point changes the center of rotation and scaling when using the on-screen controls. To position the Anchor Point, press the **.** (period key) and the Anchor Point is displayed on the screen. Then, click and drag the Anchor Point to the desired location.



Now, when you rotate or scale the shape, notice how the shape rotates and scales around the Anchor Point.

**Note:** If more than one shape is selected, they will both rotate and scale around the Anchor Point.

## Cutting, Copying and Pasting Shapes

Shapes can be cut(**Ctrl/Cmd-X**), copied(**Ctrl/Cmd-C**) and pasted(**Ctrl/Cmd-V**).

## Deleting Shapes

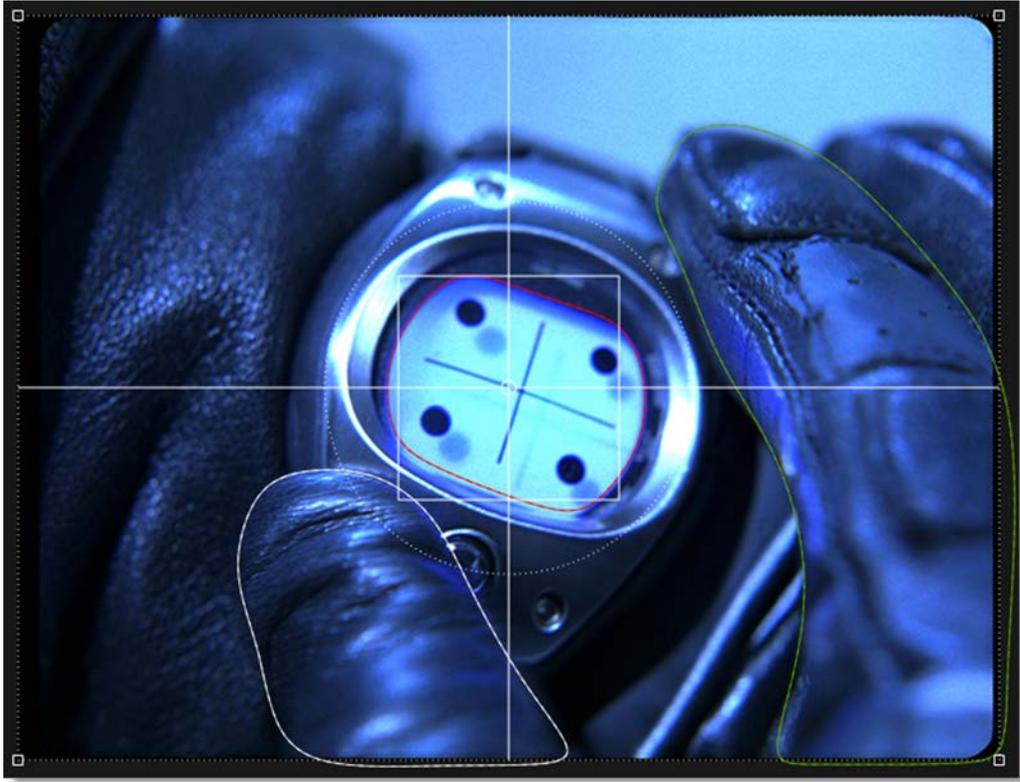
A shape or selection of shapes can be easily deleted using none other than the **Delete** key.

## Selecting Shapes

<b>Shortcut</b>	<b>Action</b>
Click on a shape	Selects the shape
<b>Shift</b> -click a shape or drag select multiple shapes	Selects multiple shapes
<b>Ctrl/Cmd</b> -click on a shape	Toggles the shape selection
Click anywhere off the shape	Deselects all shapes
<b>Shift</b> -click color pot in the Object List	Selects shapes of same color

## Transform - Layers

When a layer is selected and the Transform tool is active, you can set the Position, Scale, Rotation, Corner-Pin and Anchor Point of the layer using the on-screen controls.



## Layer Transform On-Screen Controls

<b>Shortcut</b>	<b>Action</b>
Drag within large center circle	Moves the layer
<b>Shift</b> -drag within large center circle	Constrain layer movement horizontally or vertically
Drag the intersection of the center square and the horizontal and vertical lines	Scales the layer horizontally or vertically
Drag the center square corner	Proportionally scale the layer
Drag large center circle	Rotate the layer
<b>Ctrl/Cmd</b> -drag large center circle	Rotates the layer with finer control
Drag handles on corners of image	Corner-pins the layer
Drag small center circle	Moves the Anchor point
<b>Q</b>	Activates / Deactivates translation of selected layers
<b>W</b>	Activates / Deactivates rotation of selected layers
<b>E</b>	Activates / Deactivates scaling of selected layers
<b>Q, W, E</b> then <b>Ctrl/Cmd</b>	Translates, Rotates or Scales in finer increments

You can also use the arrow keys to nudge the layer. See [Nudging](#) for more information.

## Reshape

Reshape modifies shapes by adjusting their control points and tangents. In this mode, the shape's control points and tangents are visible. You must first select a control point before it can be modified.

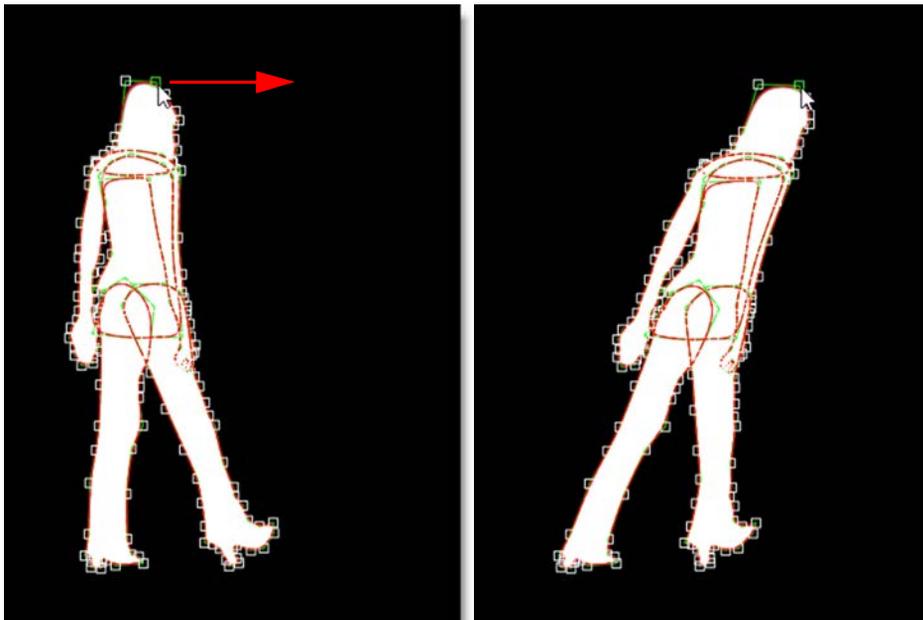
### Reshape - Normal Mode (R)

Selected points all move the same amount.



### Reshape - Magnet Mode (RR)

Points near the cursor move more than points farther away.



While in Magnet mode with multiple selected control points, you can **Shift-Alt** click in the Viewer, not on any control points or shapes, and that becomes the magnet pull position instead of using a point.

**Note:** If you prefer, use the Shape > Default Reshape Tool preference to set Magnet mode as the default mode.

## Selecting Control Points

Click on a single point to select it, **Shift**-click to add to the selection or **Ctrl/Cmd**-click to toggle the point selection.

### Rectangular Selection

Click and drag a rectangle over the control points to be selected. This is the default behavior.

### Freehand Selection

Control points can be selected by drawing a freehand polygon. **Ctrl/Cmd**-drag in the Viewer to begin the selection. Once the selection is started, release **Ctrl/Cmd** and complete the selection.

**Note:** A Shape > Freehand Point Selection preference controls whether freehand selection is used by default. Pressing **Ctrl/Cmd** and dragging uses the non-default method of selection. See the [Shape Preferences](#) for more information.

## Control Point Selection Keyboard Shortcuts

Shortcut	Action
Click on a control point. If the control point is part of a Bézier curve, its tangents appear	Selects the control point
<b>Shift</b> -click the control points or drag select multiple control points	Selects multiple control points
<b>Ctrl/Cmd</b> -drag in the Viewer to begin the selection. Once the selection is started, release <b>Ctrl/Cmd</b> - and complete the selection	Freehand select multiple control points
<b>Ctrl/Cmd-Alt-I</b>	Inverts the point selection
<b>Alt-Shift-A</b>	Selects all control points
<b>Alt-Ctrl/Cmd-A</b>	Deselects all control points
<b>Ctrl/Cmd</b> -click on a control point	Toggles the point selection
Click anywhere off the shape	Deselects all control points

**Note:** When in the Left/Right View of a stereo project, changing point selection on one shape will match the point selection on the linked shape.

Go to the [Reshape](#) tutorial to see how it works.

## Adding Control Points

Adding control points assists in tracing more detailed images. To add a control point, **Alt**-click on the selected shape. Don't click on an existing control point because it will move it instead.

**Note:** In a stereo project, adding points is only allowed when in the Left/Right View when both shapes are selected.

## Deleting Control Points

You can delete control points in one of two ways. Select the control point and press the **Delete** key or right-click on the control point and select Delete from the Reshape pop-up menu.

**Note:** In a stereo project, deleting points is only allowed when in the Left/Right View when both shapes are selected and when both shapes have the same selected control points.

## Moving Control Points

Control points are easily moved. Just select one or more control points and drag one of the selected points to a new location. You can also use the arrow keys to nudge the points. See [Nudging](#) for more information.

## Numbering Points

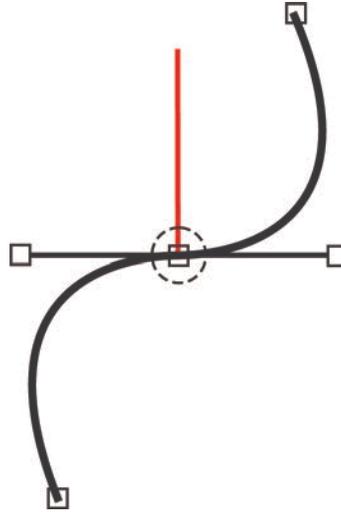
All points or a selection of points can be numbered. To number one point or a selection of points, right-click on a selected control point and select Tag. To see all points numbered, go to File > Preferences > Shape on Windows and Linux or Silhouette > Preferences > Shape on Mac and set the Number Points preference to All.

## Feather

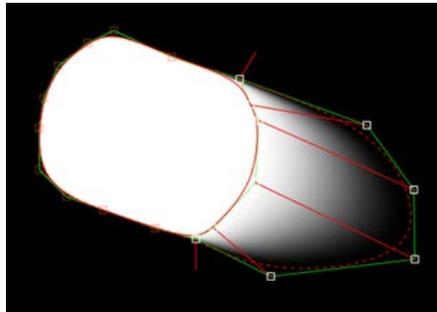
A shape's points can be feathered to create variable edged blurs on a point by point basis.

### Closed Shapes

In the Reshape tool, selected points display a red, outward feather handle. Dragging this handle outward will pull the feather out.



After the initial drag, the outer feather point can be dragged around independently.



To drag shape and feather points simultaneously, press **Shift** while dragging the shape point.

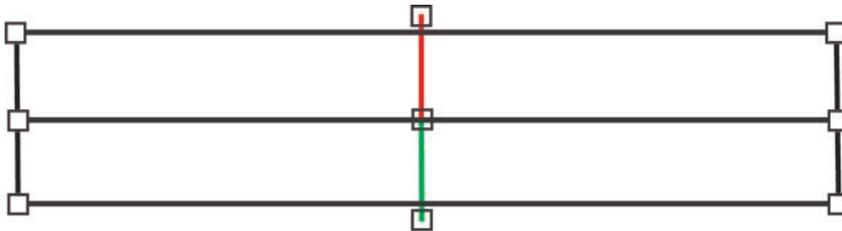
The display of the feather handles can be hidden using **Alt-F**.

## Feather Shortcuts

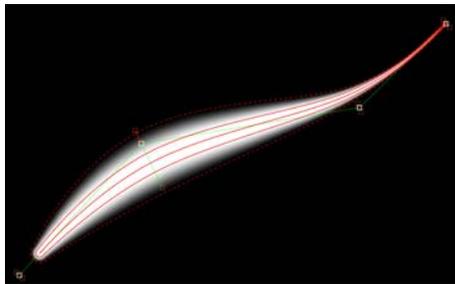
Shortcut	Action
<b>Alt-F</b>	Toggles the shape feather handle on/off
<b>Shift-Drag Shape Point</b>	Moves shape and feather points simultaneously

### Open Shapes

In the Reshape tool, select an open shape, adjust the Stroke Width to set its thickness and choose either a flat or round Cap Style in the Parameters window. Once you've done this, additional per-point feather handles appear--a red one for the Stroke Width and a green one for the Feather.



Just drag on the handles to make adjustments.

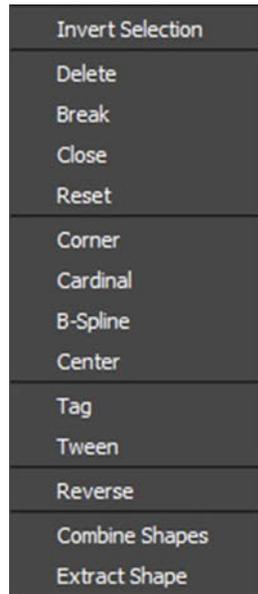


Multiple selected points can be dragged simultaneously and by a proportionate amount. To move the shape and feather points simultaneously, press **Shift** while moving the shape point.

Go to the [Feather](#) tutorial to see how it works.

## Shape Pop-up Menu

Right-click over a control point to open the Reshape pop-up menu and select one of the options. The options will change depending on the type of shape that is selected.



To modify multiple selected points simultaneously, do not right-click on one of the selected points. Right-click on an open area of the Viewer instead.

### Invert Selection

Inverts control point selection state.

### Delete

Deletes the selected control point.

### Break

Breaks the shape at the selected control point.

### Close

Closes an open shape.

### Reset

Resets the attributes of the selected control point.

## Bézier Options

### Linear

Both tangents are adjusted to one quarter the distance and in the direction of their adjoining control points.

### Corner

Creates a corner point.

### Cardinal

Creates a smooth point where the curve passes smoothly through it.

## B-Spline Options

### Corner

Creates a corner point.

### B-Spline

Creates a smooth point that is determined by the surrounding points.

## X-Spline Options

### Corner

Creates a corner point.

### Cardinal

Creates a smooth point where the curve passes smoothly through it.

### B-Spline

Creates a smooth point that is determined by the surrounding points.

### Center

Centers the control point between its adjoining control points.

## Tag

Tags control points for point numbering. For point numbers to be displayed, the Shape > Number Points preference must be set to Tagged.

## Tween

Takes the point and “re-tweens” it using the surrounding keyframes, and puts them where they would be if you hadn’t moved them on that frame. Useful for simulating an “unkey” of selected points (the shape remains keyed of course).

## Reverse

Reverses the order of all control points on all keyframes. Useful for warping and morphing, Reverse is used when you are trying to join two shapes where the control points go clockwise in one and counter-clockwise in the other. In this case, the correspondence points would iterate in different directions and the lines would cross each other. Reversing the points of one of the shapes would make them go in the same direction and the correspondence would be correct.

## Combine Shapes

Copies selected points from a source shape between the selected points of a target shape.

### Combining Shapes

- **Select the points from a source shape to be copied into a target shape.**
- **Ctrl/Cmd-click the target shape in the Object List.**
- **Select two adjacent selected points in the target shape.**
- **Right-click and choose Combine Shapes.**

## Extract Shape

Extracts the selected points of a shape into a new closed shape.

## Breaking Shapes

In the Reshape tool, closed shapes can be opened using the Break option from the control point pop-up menu. To break a shape, select a point and right-click on it to open the pop-up menu. Choose Break and the shape opens at the selected control point.

**Note:** Feather information will be removed once you break a shape.

## Closing and Extending Shapes

Shapes can be closed or extended with just a few mouse clicks. It is necessary to use the Reshape tool to perform the following actions.

### Closing Open Shapes

Select one of the control points at the end of the shape and **Alt**-click on the other end point to close the shape.

## Extending Shapes

Select a control point at either end of the shape and **Alt**-click somewhere off the shape.

## Joining Open Shapes

In the Reshape tool, open shapes can be joined together. To join open shapes, select one of the end points of the source shape by clicking on it. Next, make sure both shapes are selected in the Object window. Finally, **Alt**-click on one of the end points of the target shape. The two shapes are now joined together as one.

**Note:** The target shape inherits the attributes of the source shape.

## Converting B-Splines or X-Splines to Bézier Splines

You may convert your B-Splines or X-Splines to Bézier splines at any time. To convert a B-Spline to a Bézier spline, select a B-Spline or X-Spline and choose the Edit > Spline > Convert to Bézier menu item.

Once you select Convert to Bézier, a couple of things happen. The visibility of the B-Spline or X-Spline is toggled to off. A new Bézier spline is created and is named the same as the B-Spline or X-Spline but has an \* at the end of the name.

**Note:** The Bézier conversion of B-Splines that use extreme, variable weight adjustments will not exactly match the original B-Spline. Do not use extreme, variable weight adjustments if you are planning on converting the B-Spline to a Bézier.

## Nudging

Shapes, control points and layers can be nudged using the Arrow keys. One press of the Arrow key moves 1 pixel. Using the **Shift** key in conjunction with the Arrow keys moves 10 pixels. **Ctrl** plus the Arrow keys moves one tenth of a pixel. These nudge values can be changed in the Preferences menu located in File > Preferences > Nudging on Windows and Linux or Silhouette > Preferences > Nudging on Mac. Holding the Arrow keys down moves the selection continuously.

## Nudging Keyboard Shortcuts

Shortcut	Action
<b>Arrow</b> keys	Moves by 1 pixel
<b>Shift-Arrow</b> keys	Moves by 10 pixels
<b>Ctrl/Cmd-Arrow</b> keys	Moves by one tenth of a pixel
Hold down <b>Arrow</b> keys	Moves continuously
<b>Q, W, E</b> then <b>Ctrl/Cmd-drag</b>	Translates, Rotates or Scales in finer increments
<b>Q, W, E</b> then <b>Arrow</b> keys	Translates, Rotates or Scales by 1 pixel
<b>Q, W, E</b> then <b>Shift-Arrow</b> keys	Translates, Rotates or Scales by 10 pixels
<b>Q, W, E</b> then <b>Ctrl/Cmd-Arrow</b> keys	Translates, Rotates or Scales by 1/10 of a pixel

**Note:** Nudging of the layer transform is only available if one layer is selected, and no shapes are selected. This is to avoid confusion in case nested layers or objects in them are also selected.

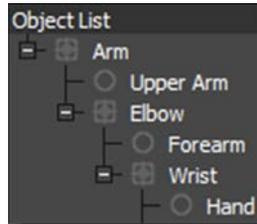
## IK-Inverse Kinematics (Y)

In computer graphics, inverse kinematics (IK) is a technique that provides automatic movement of objects. It allows elements of an object to be linked, such as the parts of an arm or leg, and causes them to move in a prescribed, realistic manner. IK simplifies the process of rotoscoping jointed, segmented figures by making the motion of each part related to the motion of the linked parts. That way, you simply have to animate the starting and ending joints, and the ones in between will adjust themselves and create more natural looking movement.



Go to the [IK](#) tutorial to see how it works.

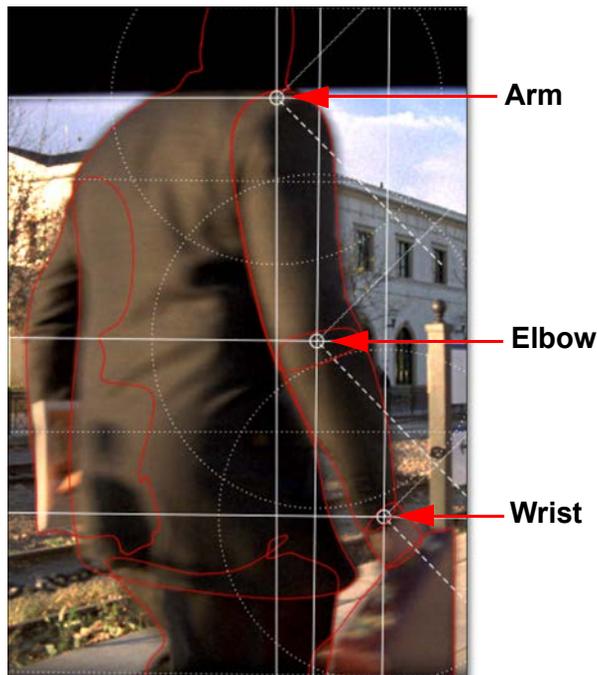
Silhouette implements IK within its existing infrastructure by using layers to model joints with one or more shapes in each layer to represent the pieces of the object. To do an arm, you would have this layout:



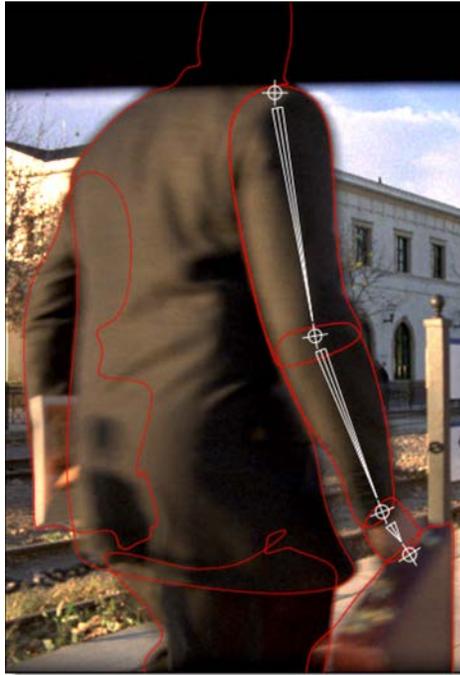
Arm, Elbow and Wrist are layers while Upper Arm, Forearm and Hand are shapes located in the appropriate layer.

Once the layers and shapes have been setup, the joints need to be placed by positioning the Anchor Point of each layer using the Transform tool.

### Joints



With the IK tool selected, select the shapes and an IK chain is built on the fly that flows up the shape's layer tree to the top-most layer. Each layer's Anchor Point becomes a joint in the IK chain. The “bones” are just the connections between the layer anchors.



Click-drag a bone or shape to rotate the shape around the parent's anchor point. Click-dragging a joint uses IK to rotate all joints up the chain. **Alt**-click-drag a joint to move the joint while attempting to keep other joints in place.

When animated, keyframes are automatically set for each layer's rotation parameter. However, you can explicitly set the layer rotation keyframes by right-clicking on a selected bone and choosing Add Key.

**Note:** To quickly jump between the Reshape, Transform, and IK tools while editing a shape, use the shortcut keys: **R** for Reshape, **T** for Transform and **Y** for IK. **R**, **T** and **Y** are very convenient since they are right next to each other.

## IK Editing

Action	Result
Click-drag bone or shape	Rotates the shape around the parent's anchor point
Click-drag joint	Uses IK to rotate all joints up the chain
<b>Alt</b> -click-drag joint	Moves the joint but tries to keep other joints in place
Right-click bone-Add Key	Sets keyframes for the selected bones

## Tracker

Tracking is a technique that involves analyzing the motion of an image over time. In Silhouette, images can be tracked using an automatic image tracking system called Planar Tracking or Point Tracking which utilizes either one, two or four track points. Silhouette includes two Planar Trackers: Silhouette's Planar Tracker and the Mocha Planar Tracker.

Go to the [Tracker](#) to see how it works.

## MultiFrame (M)

Normally, adjusting a shape or points on a shape are keyframed only on that particular frame. When MultiFrame is activated, it modifies the Transform and Reshape tools to allow you to make adjustments across all previously set keyframes or a selection of keyframes. A red outline is drawn around the Viewer to let you know that MultiFrame is active.



To use MultiFrame, select it in the Toolbar. Then, drag the red ends of the MultiFrame range bar at the top of the Timeline to limit the keyframes affected by MultiFrame.

**Note:** The MultiFrame range is displayed in the status bar while it is being edited.



The Transform or Reshape tools will now only affect keyframes within the MultiFrame selection.

Go to the [MultiFrame](#) tutorial to see how it works.

**Note:** When using MultiFrame, attempts to edit a shape outside the MultiFrame work range will be ignored. If you try to, for example, transform a shape and nothing happens, check to see if the MultiFrame range is active at that particular point in time.

## Add Weighted Key (Alt-K)

Add Weighted Key creates a keyframe at the current position which changes the timing of the animation between two surrounding keyframes. Park between two keyframes, select a shape, press **Alt-K**, and drag the slider to adjust the weight.

## RotoOverlay (Shift-O)

The RotoOverlay tool provides three options to visualize the selected shape's animation and motion blur: Motion Path, Motion Blur and Onion Skin.

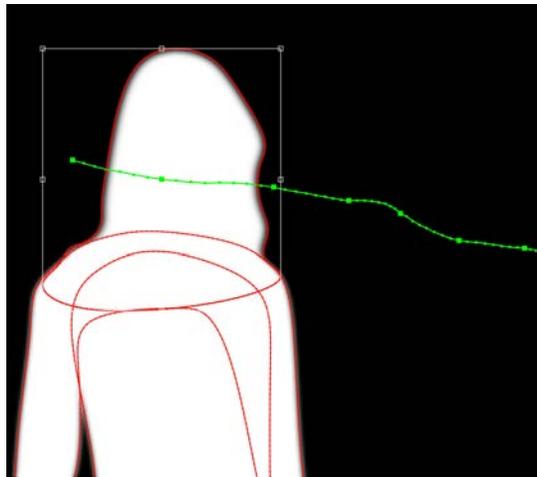


Once selected, a Roto Overlay window opens allowing you to select or deselect various options.



### Motion Path

Displays the shape's motion path with visual indicators for frames and keyframes.



Hold **Alt** over a motion path marker and the frame number is displayed in the status bar. Click on the marker and the Timebar will jump to that frame.

## Motion Blur

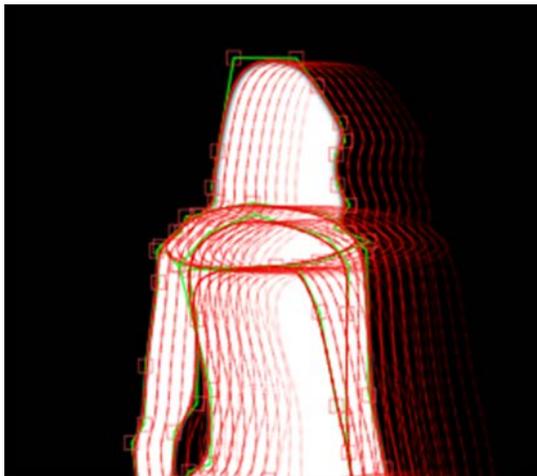
Displays a dashed line to show the width of the motion blur.



**Note:** When the Viewer is set to Foreground, this option allows you to visualize the motion blur without rendering it. This provides a significant speed increase when using many shapes with motion blur.

## Onion Skin

Shows the shape outline on previous and future frames.



Hold **Alt** over an onion skin shape and the frame number is displayed in the status bar. Click on the shape and the Timebar will jump to that frame.

## Onion Skin Frame Range

Determines the amount of frames used in the onion skin.

### Backward

The Onion Skin Frame Range Backward numeric field (the first one) displays the frames before the current frame.

### Forward

The Onion Skin Frame Range Forward numeric field (the second one) displays the frames after the current frame.

**Note:** By default, the Backward and Forward numeric fields are ganged together. Click the lock icon to decouple them.

## Use Shape Color

As an alternative to using the pre-defined colors for the Motion Path, Motion Blur and Onion Skin, you can use the default shape colors.

## Shape Import

### Importing Shapes

Silhouette, Mocha Pro, Commotion, Elastic Reality and Shake 4.x SSF shapes can all be imported into Silhouette using the File > Import > Shapes menu.

**Note:** Mocha Pro shapes and layers are imported into Silhouette using the Silhouette Shapes format. If Copy to Clipboard was used in Mocha Pro instead of saving to a file, the shapes and layers are copied to the system clipboard and can then be pasted into Roto.

Go to the [Import](#) tutorial to see how it works.

## Node Parameters

When the Roto is selected, parameters specific to Roto, such as Motion Blur, can be adjusted in the Node parameters.

### Alpha

#### Invert

Inverts the alpha channel.

#### Blur

Blurs the alpha Channel. The blur range is from 0-100 and defaults to 0.

## Color

Renders shapes as outlines or filled with color in the RGB output. The color is set using the Shape > Color parameter.

### Enable

Activates the color parameters.

### Outline Size

Sets the thickness of the shape outline.

### Fill Opacity

Sets the opacity of the color fill. You can also change the opacity of each shape separately using the Shape > Opacity control.

## Motion Blur

Motion blur is the directional blurring of rapidly moving shapes. Enables Motion Blur for Roto.

Go to the [Motion Blur](#) tutorial to see how it works.

### Enable

Turns Motion Blur on or off. The default is off. Leave this turned off for faster interaction while editing shapes.

**Note:** The Motion Blur parameters will not affect shapes unless you first activate Motion Blur for each shape in the Object Parameters. See the [Motion Blur](#) section in the Shape Parameters for more information.

### Shutter Angle

Determines how long the camera shutter stays open when a picture is taken--higher values create more motion blur. The range of the Shutter Angle is 0-720 and defaults to 180. Measured in degrees, it simulates the exposure of a rotating camera shutter. The shutter angle uses the footage frame rate to determine the simulated exposure. For example, a shutter angle of 180 degrees (50% of 360 degrees) for 24fps footage creates an effective exposure of 1/48 of a second. Typing 1 degree applies almost no motion blur, and typing 720 degrees applies a high degree of motion blur.

## Shutter Phase

Offsets the point in time, either forward or reverse, when the shutter opens. The range of the Shutter Phase is -360 to 360 and defaults to -90.

## Motion Samples

Renders intermediate frames equal to the Motion Samples value and accumulates them, one over the other, on a single frame. The higher the number, the smoother the motion. The Motion Samples range is from 1-256 and defaults to 16.

**Note:** Normally, motion blur is calculated going forward, so if there is no shape motion beyond the end of a clip, there won't be motion blur on the last frame. To work around this, add an extra frame or two to the end of the work range in the Timebar and move the shape's last keyframe to be outside of the session range.

## Antialias

Controls whether roto shapes are antialiased on their edges.

# Tracker (Shift-T)

## Description

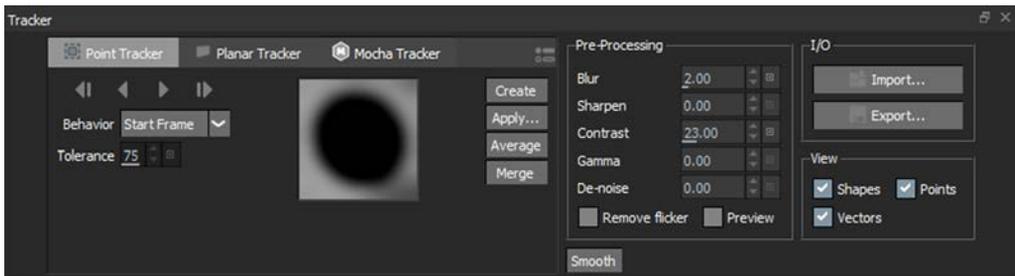
Tracking is a technique that involves analyzing the motion of an image over time. Images can be tracked using an automatic image tracking system called planar tracking using either Silhouette's Planar Tracker or the Mocha Planar Tracker. In addition, you can use a Point Tracker which utilizes either one, two or four track points. One point tracking obtains horizontal and vertical movement. Two point tracking analyzes scaling and rotation in addition to horizontal and vertical movement. Lastly, four point tracking evaluates and applies perspective movement using a corner-pin transformation.

However the tracking data is obtained, it can then be applied in one of two ways: match moving or stabilization. Match moving applies the motion of the trackers to an object so that it follows the motion of the clip. Stabilization inverts the tracking data so that the clip appears to be stable.

The Tracker tool is located in the Roto node and when selected displays various tracking features and controls.

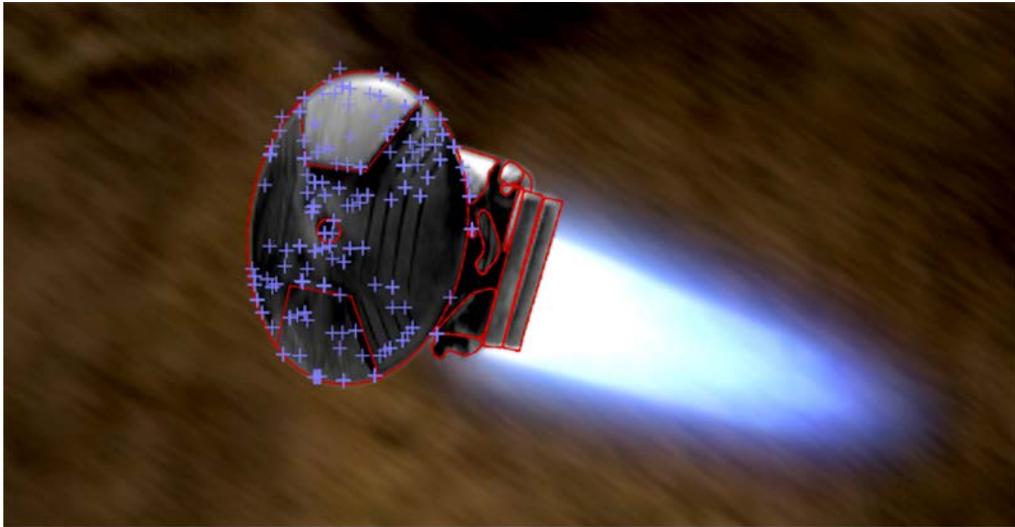
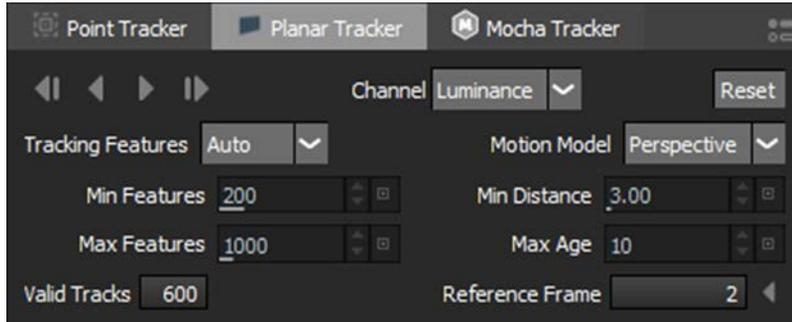


When the Tracker (**Shift-T**) is selected, various non-animateable controls appear in a Tracker Tool Tab located at the bottom portion of the screen. You have the choice of using either the Point Tracker, Planar Tracker or Mocha Tracker.



## Planar Tracker

Silhouette's Planar Tracker tracks several points (corners, edges and ridges) on the image while automatically handling partial occlusions of the tracked object, producing excellent results even with textureless objects.



### Using the Planar Trackers

The key to getting the most out of the Planar and Mocha trackers is to learn to find planes of movement in your shot which coincide with the object that you want to track. Sometimes it will be obvious--other times you may have to break your object into different planes of movement. For instance, if you were tracking a tabletop, you would want to draw the spline to avoid a flower arrangement in the center of the table, since it is not on the same plane and will make your track less accurate.

## Planar Trackers Setup

Both the Planar and Mocha trackers require a selected layer with at least one shape in it to drive the tracker.

**Note:** If shapes are selected and not in a layer, clicking the Track Forward/Backward buttons will create a new layer, make it active and begin tracking.

If shapes are selected in an unselected layer, clicking the Track Forward/Backward buttons will make the layer active and begin tracking.

The shape should surround the object you are tracking, but it does not have to be exact and it is best to leave a little extra room around it. In addition, you can use more than one shape as long as they are on the same geometric plane.

## Handling Occlusions

In some cases, there are parts of an image that can interfere with the effectiveness of the Planar and Mocha trackers. To handle this, you can create an exclusion zone in the area you are tracking. For instance, a computer screen with strong reflections could cause the track to jump. To exclude an area while tracking, create a subtractive shape above the primary tracking shape. Then, select both the shapes prior to tracking.

Go to the [Planar Trackers](#) tutorial to see how it works.

## Tracker Direction

The Tracker Direction buttons are used to track backwards and forwards and are enabled when a layer has been selected.



### Track Backward One Frame

Tracks backward one frame at a time.



### Track Backward

Tracks backward to the beginning of the Timebar.



## Track Forward

Tracks forward to the end of the Timebar.



## Track Forward One Frame

Tracks forward one frame at a time.



As you track, the tracker's transform data is automatically applied to the selected layer.

**Note:** When a layer is selected prior to tracking, the per-shape blend mode, invert state, on/off state and opacity are all obeyed. This allows you to use multiple shapes while tracking.

## Channel

Determines which image channel the tracker uses to analyze the image.

### Luminance

The tracker analyzes the luminance or brightness of the image.

### Red

The tracker analyzes the image's red channel.

### Green

The tracker analyzes the image's green channel.

### Blue

The tracker analyzes the image's blue channel.

## Reset

Resets the tracking points.



## Tracking Features

### Auto

Tracks corners, edges and ridges and automatically selects the best result.

## Corners

Tracks corners, crosses or points.

## Edges

Tracks edges of a solid object.

## Ridges

Tracks lines appearing as a strips or bands.

## Motion Model

### Perspective

Tracks perspective changes. Good for large shapes.

### Affine

Tracks translation, rotation, scale, and skew. Good for medium shapes.

### Translation

Tracks the XY offset. Good for small shapes.

## Min Features

The minimum number of trackers to generate.

## Max Features

The maximum number of trackers to generate.

## Min Dist

The minimum distance between trackers.

## Max Age

The maximum number of frames a specific tracker will live until it is removed and a new tracker is generated.

**Note:** If you have really good tracks, you can increase the Max Age to cover the entire sequence and the trackers will live for the entire time and will result in a smoother transform. However, this value has to remain low to handle automatic occlusion handling.

## Valid Tracks

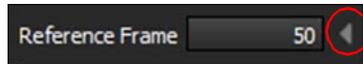
The number next to Valid Tracks is a running total of the number of trackers that are viable as the tracker progresses.

## Reference Frame

Displays the reference frame number. The reference frame is the frame you first started tracking on and it locks in the picked set of track points at that frame.

### Jump to Reference Frame

When clicked, the Timebar is positioned at the reference frame.



## Group Tracking

Multiple layers containing non-overlapping shapes are tracked as separate planar surfaces.



## Part Tracking

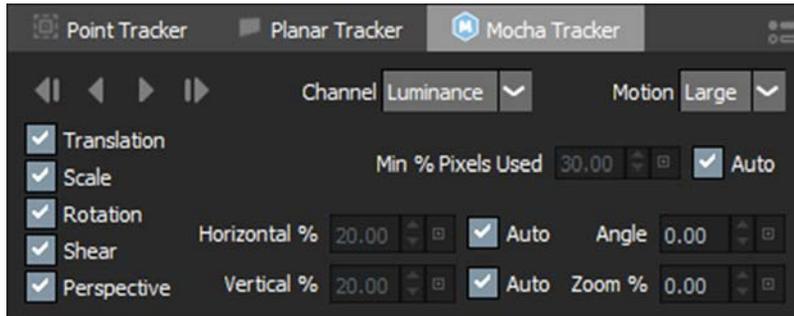
With multiple layers containing overlapping shapes, there is an interaction between them whereby they share coarse motion, but have individual motion at the fine scale. This is helpful when tracking non-planar surfaces.



## Mocha Planar Tracker

The Mocha Planar Tracker provides 2D transformation data by tracking planes rather than points.

Go to the [Planar Trackers](#) tutorial to see how it works.



As with Silhouette's Planar Tracker, the Mocha Planar Tracker requires that you create a layer in the Object List and have at least one shape within it to drive the tracker. The shape should surround the object you are tracking, but it does not have to be exact and it is best to leave a little extra room around it. In addition, you can use more than one shape as long as they are on the same geometric plane.

### Tracker Direction

The Tracker Direction buttons are used to track backwards and forwards and are enabled when a layer has been selected.



### Track Backward One Frame

Tracks backward one frame at a time.



### Track Backward

Tracks backward to the beginning of the Timebar.



## Track Forward

Tracks forward to the end of the Timebar.



## Track Forward One Frame

Tracks forward one frame at a time.



As you track, the tracker's transform data is automatically applied to the selected layer.

**Note:** When a layer is selected prior to tracking, the per-shape blend mode, invert state, on/off state and opacity are all obeyed. This allows you to use multiple shapes while tracking.

## Channel

Determines which image channel the tracker uses to analyze the image.

### Luminance

The tracker analyzes the luminance or brightness of the image.

### Red

The tracker analyzes the image's red channel.

### Green

The tracker analyzes the image's green channel.

### Blue

The tracker analyzes the image's blue channel.

## Min % Pixels Used

Min % is one of the most important parameters to look at for tracking. By default, the minimum percentage of pixels used is dynamic. When you draw a shape, the Mocha Planar Tracker tries to determine the optimal amount of pixels to look for in order to speed up tracking. If you draw a very large shape, the percentage will be low. If you draw a small shape, the percentage will be high.

In many cases, the cause of a drifting or slipping track is a low percentage of pixels. If you want a more solid and accurate track, try setting the Min % Pixels Used value to a higher amount. Keep in mind, however, that a larger percentage of pixels can mean a slower track.

Min % Pixels Used is set to Auto by default.

## **Motion**

These Motion parameters control what motion you are looking for when you track.

### **Translation**

The position of the object.

### **Scale**

Whether the object gets larger or smaller.

### **Rotation**

The angle of rotation of the object.

### **Shear**

How the object is skewing relative to the camera.

### **Perspective**

How the object is moving in perspective relative to the camera.

The main difference between shear and perspective is the relative motion. Shear is defined as the object warping in only two corners, whereas perspective is most often needed where the object is rotating away from the viewer significantly in space.

As an example, if someone is walking towards you, their torso would be showing shear as it rotates slightly back and forth from your point of view.

The front of a truck turning a corner in front of you would be showing significant perspective change.

### **Large Motion**

This is the default. It searches for motion and optimizes the track as it goes. Small Motion is also applied when you choose Large Motion.

## Small Motion

Small Motion only optimizes. You would use Small Motion if there were very subtle changes in the movement of the object you are tracking.

## Search Area

The Search Area defines ranges for the tracker to search within.

## Horizontal/Vertical

Determines the distance in pixels within the footage to search for the next object position. This is set to Auto by default.

## Angle

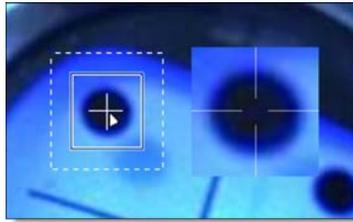
If you have a fast rotating object, like a wheel, you can set an angle of rotation to help the tracker to lock onto the detail correctly. The tracker will handle a small amount of rotation, less than  $10^{\circ}$  per frame, with Angle set to zero.

## Zoom %

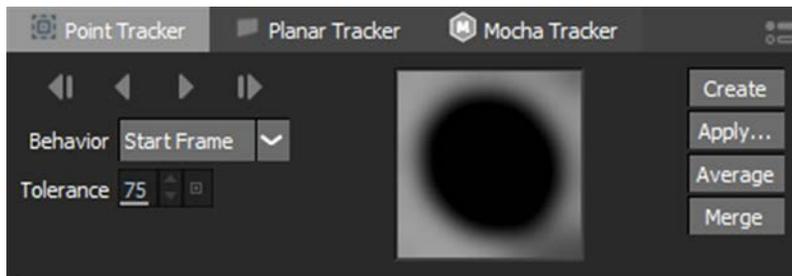
If you have a fast zoom, you can add a percentage value here to help the tracker. Again, the tracker will still handle a small amount of zoom with this set to zero.

## Point Tracker

The Point Tracker uses trackers which are placed on distinguishable image features.

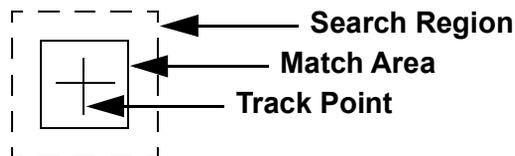


Go to the [Point Tracker](#) tutorial to see how it works.



### Tracker Components

Each tracker has a Match Area, Search Region, and Track Point.



### Match Area

The inner box is the Match Area. It defines a pattern that will be searched for from frame to frame. It's a good idea to choose a region with good contrast and detail. Corners with sharp contrast are usually good areas to track as movement can easily be detected in any direction. The Match Area can be scaled to the desired size.

## Search Region

The outer, dashed box is the Search Region, which should be the maximum amount your tracking point will move between frames. The larger the size, the slower the processing. The trick is to make the Search Region as small as possible, yet still large enough to cover the area the tracker will move from frame to frame. The Search Region can be sized in the same fashion as the Match Area.

## Track Point

The center cross is the track point. It represents the position of the motion track. Normally, the Track Point is at the center of the tracker, but can be offset if the Match Area becomes obscured.

## Tracker Direction

The tracker can track both forward and backward one frame at a time or for the entire duration. The controls are enabled once a tracker has been selected.



### Track Backward One Frame

Tracks backward one frame at a time.



### Track Backward

Tracks backward to the beginning of the Timebar.



### Track Forward

Tracks forward to the end of the Timebar.



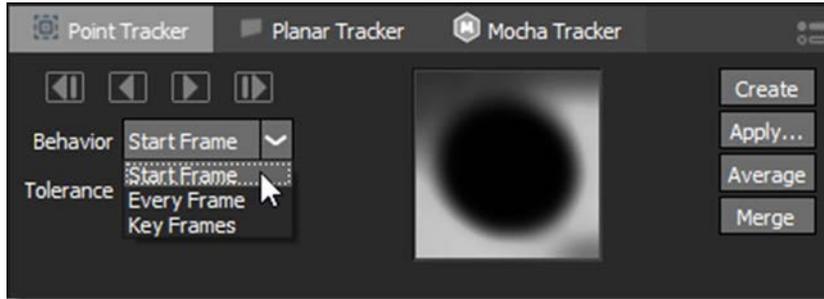
### Track Forward One Frame

Tracks forward one frame at a time.



## Behavior

Behavior decides what frame should be used as the reference to check the accuracy of the Match Area. By default, the reference is the first frame at which you started the track.



### Start Frame

At each frame, the Match Area is compared to the first frame at which you started tracking. If you stop tracking halfway through your clip, and start up again at a later frame, the later frame will be used as the reference.

### Every Frame

The Match Area is compared to the previous frame. This method will cause inherent drift in your track, but is useful for clips that have drastic changes in perspective and scale.

### Key Frames

For difficult shots, it is helpful to pre-set keyframes for the tracker at various points in the clip. The Match Area will use these keyframes as a reference while tracking.

### Tolerance

Describes the level of accuracy between the Match Area that the Tracker is searching for and the area it actually finds when searching from frame to frame. A perfect match would be a value of 100. If the error that is calculated is below the Tolerance value, no keyframe will be set on that particular frame. The Tolerance is preset to a value of 75.

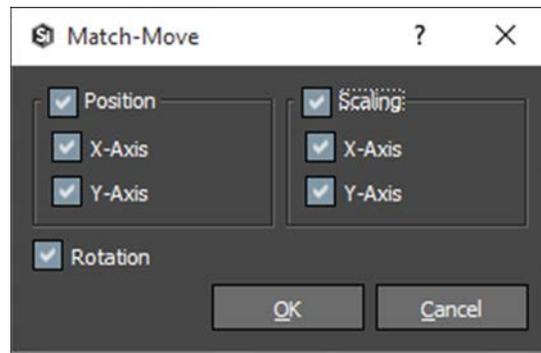
## Create

Clicking on the Create button places a new tracker in the center of the screen. You can also add a new tracker at any time by **Alt**-clicking the image when the Tracker is activated.



## Apply

Selecting the Apply button opens the Match Move window where you determine how the tracking data will be applied.

When OK is clicked, the tracking data is transferred to the Layer's > Transform > Matrix parameter.

**Note:** With only trackers selected, clicking Apply creates a new layer and the tracking data is applied to that layer.

If a layer is selected along with the trackers, the tracking data will be applied to the selected layer.

Go to the [Applying Trackers](#) tutorial to see how it works.

### Position

Applies X/Y position data to the layer.

### Scaling

Applies X/Y scaling data to the layer. Requires two trackers.

## Rotation

Applies rotation data to the layer. Requires two trackers.

## Average

Averages multiple tracks into a new destination track. A common technique is to track forwards from the first frame to the last, and then create a second track, tracking backwards from the last frame to the first. These two trackers are then averaged together to derive a more accurate track.

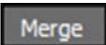


To average trackers, select more than one tracker and click the Average button. A new averaged tracker is created.

Go to the [Averaging Trackers](#) tutorial to see how it works.

## Merge

If you have multiple trackers that cover different frame ranges, they can be merged into one tracker, automatically compensating for the different offsets.



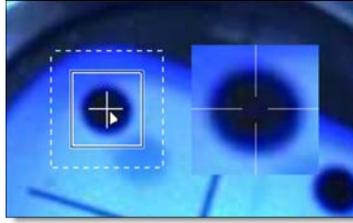
Ideally, the trackers should overlap in time by at least one keyframe.

Go to the [Merging Trackers](#) tutorial to see how it works.

## Tracker Parameters

Most tracker parameters are interactively set while moving the tracker in the Viewer. When a point tracker is selected, its parameters are displayed in the Object Parameters.

## Magnify Window



A magnified version of the Match Area is displayed to aid in the placement of a tracker. It is activated when you click the Create button or when you move an existing tracker. The magnified area is displayed in the color space selected from the Mode pop-up menu.

### Position

Sets the position of the Track Point. This parameter is automatically set when using the on-screen tracker controls.

### Nudging Trackers

Trackers can be nudged using the Arrow keys. One press of the Arrow key moves the tracker 1 pixel. Using the **Shift** key in conjunction with the Arrow keys moves the tracker 10 pixels. **Ctrl** plus the Arrow keys moves the tracker one tenth of a pixel. These nudge values can be changed in the Preferences menu located in File > Preferences > Nudging on Windows and Linux or Silhouette > Preferences > Nudging on Mac. Holding the Arrow keys down slides the tracker.

## Tracker Nudging Keyboard Shortcuts

<u>Shortcut</u>	<u>Action</u>
<b>Arrow</b> keys	Moves the tracker by 1 pixel
<b>Shift-Arrow</b> keys	Moves the tracker by 10 pixels
<b>Ctrl/Cmd-Arrow</b> keys	Moves the tracker by one tenth of a pixel
Hold down <b>Arrow</b> keys	Moves the tracker continuously

### Channel

Determines which image channel the tracker uses to analyze the image.

## RGB

The tracker analyzes the red, green and blue channels of the image.

## Luminance

The tracker analyzes the luminance or brightness of the image.

## Red

The tracker analyzes the image's red channel.

## Green

The tracker analyzes the image's green channel.

## Blue

The tracker analyzes the image's blue channel.

## Match Offset

Offsets the Match Area from the tracker. This parameter is automatically set when using the on-screen tracker controls.

## Search Offset

Offsets the Search Region from the tracker. This parameter is automatically set when using the on-screen tracker controls.

## Match Size

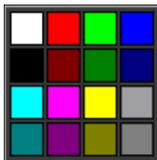
Sets the size of the Match Area. This parameter is automatically set when using the on-screen tracker controls.

## Search Size

Sets the size of the Search Region. This parameter is automatically set when using the on-screen tracker controls.

## Path Color

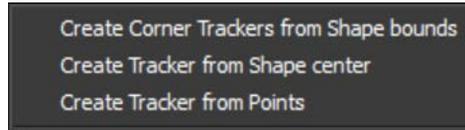
Sets the color of the tracker's path. Left-clicking the color pot opens a standard color picker while right-clicking on the color pot opens a pop-up color menu with 16 primaries.



## Tracker Pop-Up Menu

### Point Tracker

With the Tracker tool enabled, right-click over a shape or a selected control point to open the Tracker pop-up menu.



Trackers can be created based on a shape's points, the center point of a shape or the shape's bounding box. Trackers created in this manner are a concatenation of the shape and layer transformation data. So, why do this? Because, it is a handy way of creating trackers with all of this combined data for use in other programs.

#### **Create Corner Trackers from Shape Bounds**

Creates four trackers around the four corners of the shape bounding box.

#### **Create Tracker from Shape Center**

Creates one tracker in the center of the shape.

#### **Create Tracker from Points**

Creates trackers from selected points.

### Planar Tracker

#### **Create Point Tracker**

Planar Tracker track points can be converted to point trackers which can then be treated like any other point tracker; they can be merged, smoothed, averaged, and applied to layers. Right-click on a planar track point, choose Create Point Tracker and a new point tracker is created.

## Pre-Processing

Images that contain film grain or video noise, lack contrast or sharpness as well as images that have flicker can be tracked more accurately by applying certain filters during the tracking process. Filters such as Blur, Sharpen, Contrast, Gamma, De-Noise and Remove Flicker will increase tracker accuracy for problematic images.

## Blur

Applies a blur to the image features.

## Sharpen

Sharpens image features.

## Contrast

Increases contrast.

## Gamma

Increases brightness by leaving the white and black points the same and only modifies the values in-between.

## De-Noise

Applies a de-noise algorithm to smooth out noise while retaining detail.

## Remove Flicker

Corrects image flicker or brightness variation over time, which has a habit of interfering with tracker accuracy.

## Preview

Shows the effect of the Pre-Processing parameters on the entire image in the Viewer.

## Smooth

Smooths out inaccuracies in the tracking data.

A rectangular button with a dark grey background and the word "Smooth" in white text.

To smooth, select a point tracker or planar tracked layer and click the Smooth button. Adjust the slider when it pops-up and adjust it to the desired level of smoothing.

Go to the [Smoothing Point Trackers](#) or the [Smoothing Planar Tracked Layers](#) tutorials to see how it works.

## I/O

Importing and exporting tracking data takes place in the I/O section of the Tracker tab.

## Import

After Effects Corner-Pin, Nuke, Shake or Simple Format formatted trackers can be imported into Silhouette. If you would like to import trackers from non-supported applications, simply export a Silhouette tracker in Simple Format to see how it should be formatted.

Go to the [Importing Tracking Data](#) tutorial to see how it works.

## Export

Trackers can be exported to the After Effects, Autodesk, Nuke and Shake tracker formats. In addition, the tracking data applied to a layer, either by the Point Tracker or Planar Tracker, can be exported as a four point corner-pin track.

To create trackers for export that are a concatenation of the shape and layer transformation data, see the [Tracker Pop-Up Menu](#) section for more information.

Go to the [Exporting Tracking Data](#) tutorial to see how it works.

## View

Shapes, points or tracker vectors can be toggled on or off.

### Shapes

Toggles the display of shapes in the Viewer.

### Points

Toggles the display of Planar Tracker track points in the Viewer.

### Vectors

Toggles the display of tracking vectors in the Viewer. This option is not available for use with the Planar Tracker.

## Preferences

Seldom adjusted tracker controls can be accessed by clicking the Tracker Preferences icon.

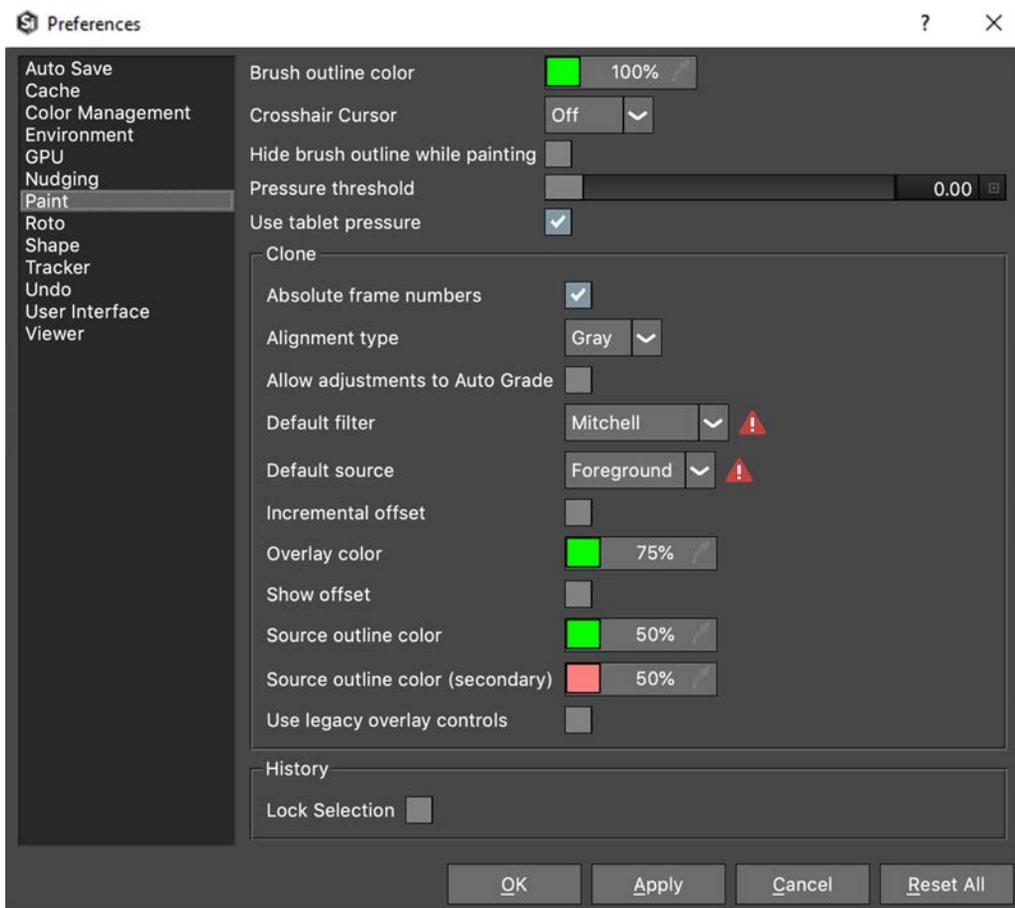


See the [Tracker Preferences](#) for information on their use.



## PREFERENCES

Preferences allow you to customize default settings and can be accessed by selecting File > Preferences on Windows and Linux or Silhouette > Preferences on Macintosh.



# Autosave

## Interval (minutes)

Sets the default time for autosaving the project. Set interval to 0 to disable autosave.

## Maximum # of Backups

Controls how many backup files are created. Each time a project is saved, a copy is stored in the project folder.

## Cache

### % ROI Overscan

Sets the amount of extra pixels to save around the ROI in the Cache.

### % Total Physical RAM

Sets the amount of RAM to be used for playback. The default is 50% and the range is 10-90%.

**Note:** A program restart is needed to enable % Total Physical RAM changes.

# Color Management

## Cineon/DPX Working Colorspace

Controls whether or not Cineon and DPX images are converted to scene linear.

### Linear

Converts the Cineon/DPX images to scene linear.

### Log

Cineon/DPX images are kept in log space.

**Note:** After changing this preference, you must restart Silhouette for changes to take effect as the value is cached.

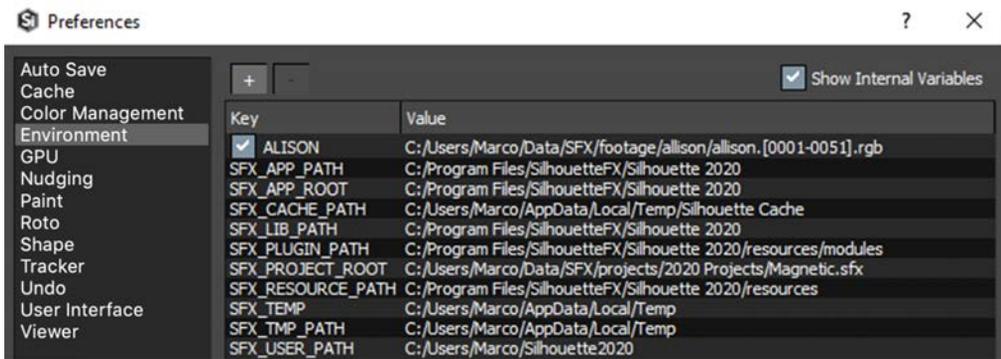
**Warning:** It is not a good idea to change this preference in the middle of a paint session, since when in Linear mode, it physically alters the pixels on import/export.

## OCIO Configuration

This preference is a path to a global configuration file to use. The default is “\$(OCIO)”. Silhouette will initially look for \$SFX\_OCIO and will use that first. Otherwise, it will use whatever the configuration preference is set to and finally it will check for \$OCIO. If it still can't find a configuration, it will fall back to the embedded configuration in the resources/ocio folder.

# Environment

The Environments preference sets environment variables directly inside Silhouette without having doing so in the operating system. Once applied, variables are immediately available in Silhouette, sub-processes, and scripts.



+

Adds a new variable

-

Remove the selected variable.

## Show Internal Variables

Display the internal variables used by Silhouette. These cannot be changed.

**Note:** Variables can contain references to other variables.

**Note:** Variables are changed when Apply is pressed. Reset has no effect for this page.

# GPU

The GPU preference determines whether or not GPU acceleration is enabled.

## Auto

Automatically chooses either GPU or CPU acceleration based on your graphics card.

## GPU

Forces GPU acceleration on. If your graphics card is not capable of GPU acceleration, this setting will have no effect.

## CPU

Forces CPU acceleration on.

**Note:** The GPU preference doesn't actually change until there is a frame or processing update.

# Nudging

## Distance (pixels)

Sets how many pixels an object moves when the **Arrow** keys are used.

## Extended (Shift) Distance (pixels)

Sets how many pixels an object moves when the **Arrow** keys are used in conjunction with the **Shift** key.

## Precise (Ctrl/Cmd) Distance (pixels)

Sets how many fractional pixels an object moves when the **Arrow** keys are used in conjunction with the **Ctrl/Cmd** key.

## Paint

### Brush Outline Color

Sets the color of the brush outline.

### Crosshair Cursor

Controls the display of the cursor crosshair while painting.

#### Off

The cursor crosshair is not displayed.

#### On

The cursor crosshair is always displayed.

#### On/Off

The cursor crosshair disappears while painting a stroke, but is visible otherwise.

### Hide Brush Outline While Painting

Hides the brush outline while painting.

### Pressure Threshold

Controls how hard the pen has to be pressed before opacity kicks in. The preference is from 0-1. When the threshold has been reached, the calculated pressure is scaled into the new range from threshold to 1.

### Use Tablet Pressure

Turn tablet pressure sensitivity on or off.

### Clone

#### Absolute Frame Numbers

When activated (the default), displays the actual frame number in the Clone > Frame field. When turned off, it uses the old Silhouette v2.3 behavior where an offset in relation to the current frame was shown instead of the actual frame.

## Alignment Type

### Black

When in Align mode, the Viewer appears black when the Clone source and destination are perfectly aligned.

### Gray

When in Align mode, the Viewer appears gray when the Clone source and destination are perfectly aligned.

## Allow Adjustments to Auto Grade

Allows the other grade controls to be used in conjunction with Auto Grade. With this preference off, turning on Auto Grade will reset the other grade controls to their defaults and disable them.

## Default Filter

Sets the default filter for new paint nodes.

## Default Source

Sets the clone source default.

## Incremental Clone Offset

Controls whether the Clone offset starts at last offset or at click location.

## Overlay Color

Sets the color of the Clone transform on-screen controls.

## Show Offset

Forces the Clone Offset connecting line to always be displayed.

## Source Outline Color

Sets the color of the Clone brush outline.

## Source Outline Color (Secondary)

Sets the color of the secondary Clone brush outline. This is the color of the second Clone source activated by using Dual in the Clone presets.

## Use Legacy Overlay Controls

Enables the Silhouette v6 and below Clone transform on-screen controls.

## History

### Lock Selection

If paint strokes are selected in the Paint History, they become un-selected when you change frames. If you enable Lock Selection, the strokes stay selected when changing frames.

# Roto

## Composite Color

Sets the default color background when viewing Color Comp in the Roto node.

# Shape

## Active Point Color

Sets the default color of the active point (the point that the cursor is hovering over) through the use of a standard color picker.

## Auto Switch to Reshape Tool

After closing a new shape, you will switch to the Reshape tool automatically.

## Blur Type

Sets the default blur type: Center, Inner, Outer.

## Bounding Box Color

Sets the default color of shape bounding boxes through the use of a standard color picker.

## Control Handle Size

Sets the size of control point handles.

## Control Point Color

Sets the default color of control points through the use of a standard color picker.

## Default Interpolation

Sets the default keyframe interpolation type.

### Hold

There is no interpolation and abrupt switches in value occur at keyframes.

### Linear

When values change, a straight line with sharp, abrupt angles from one keyframe to the next is drawn.

### Ease In

Eases in to the selected keyframe.

### Ease Out

Eases out of the selected keyframe.

## Ease In/Out

Eases in and out of a selected keyframe.

## Smooth (Catmull-Rom)

Smooth (Catmull-Rom) creates a smooth curve between keyframes.

## Default Outline Color

Sets the default color of the shape outline through the use of a standard color picker.

## Default Reshape Tool

Sets the default mode for the Reshape tool.

### Normal

Selected points all move the same amount.

### Magnetic

Points near the cursor move more than points farther away.

## Enable Legacy Feathering

Enables the Silhouette v5 and below Feather tool. Once enabled, the Feather tool appears in the user interface.

## Fade Outline with Opacity

Draws unselected/inactive shape outlines using the shape opacity value. The **V** key toggles this preference so that you can easily see any shapes that are at 0% opacity.

## Freehand Point Selection

When enabled, point selection is done by freehand selection. Press **Ctrl** while dragging for rectangular selection.

When disabled, point selection is done by rectangular selection. Press **Ctrl** while dragging for freehand selection.

## Hide Hulls During Edit

When activated, tangents/hulls hide when editing.

## Hide Outlines During Edit

When activated, the shape outline is hidden when editing.

## Hull Color

Sets the default color of the hull (lines that connect tangents) through the use of a standard color picker.

## Interpolation Engine

### Temporal

Enables all interpolation types except for Smooth (Catmull-Rom).

### Spatial (Nuke-compatible)

Interpolation types are limited to Smooth (Catmull-Rom), Hold and Extrapolate. This ensures that shapes using Smooth (Catmull-Rom) interpolation in Silhouette exactly match the result in Nuke when exported.

## Number Points

### None

Control points are not numbered.

### Tagged

Only control points that have been tagged using the Reshape tool > control point pop-up menu are numbered.

### All

All control points are numbered.

## Primitive Type

Sets what shape type is used when circles and squares are created.

### Bézier

Bézier shapes are used for circle and square creation.

### B-Spline

B-Splines are used for circle and square creation.

## X-Spline

X-Splines are used for circle and square creation.

## Recursive Subdivide

Drastically improves the curvature of shapes and reduces artifacts when using feathering. You can return to the previous behavior of v4.0.4 and below which used a fixed-step iterator by turning this preference off, if for some reason it causes shape artifacts.

## Rotate from Center of Selection Bounding Box

Controls whether the automatic anchor point is set to the center of the collective bounding box or to the opposite handle.

## Selected Point Color

Sets the default color of selected points through the use of a standard color picker.

## Show Feather Handles

Displays feather handles on shape points. **Shift-F** toggles this setting.

## Show Shape Name

Displays the shape name in the center of the shape.

## Show Tangent Vectors

Turns Bézier tangents on or off. Turns B-Spline and X-Spline hull drawing on or off.

## Template Color

Sets the color and opacity of unselected shapes. This Viewer Template feature is enabled by using **Shift-W**.

## Transform from Center of Selection Bounding Box

Controls whether the automatic anchor point is set to the center of the collective bounding box or to the opposite handle.

## X-Spline Point Type

Controls the default weighting of X-Spline points when they are created.

## **B-Spline**

X-Spline points have B-Spline weighting.

## **Cardinal**

X-Spline points have Cardinal weighting.

## **Corner**

X-Spline points have Corner weighting.

## **X-Spline Tension Factor**

This is a weight from -10 to 10 that is multiplied by the mouse delta when manipulating the X-Spline point tension. You can reverse the sense of the weight by making this value negative. Also, you can boost the amount the tension is adjusted based on mouse movement by making the value larger, for example closer to -10 or 10.

# Tracker

## Create Point Trackers in Root

When enabled, point trackers are placed in the root of the Object list, rather than the selected layer.

## Default Path Color

Sets the default color of the tracker path.

## Default Point Track Tolerance

Sets the default tracker tolerance. Describes the level of accuracy between the Match Area that the Tracker is searching for and the area it actually finds when searching from frame to frame.

## Point Tracking Behavior

Sets the default tracker behavior. Behavior decides what frame should be used as the reference to check the accuracy of the Match Area.

## Show Path Points

Displays tracker points along the path of the track.

## mocha

### Drift Compensation

Enables mocha's Drift Compensation feature where surrounding frames are used to decrease tracker drift.

### Use GPU If Available

Enables GPU acceleration if a compatible graphics card is found.

## Planar Tracker

### Drift Compensation

Enables Silhouette's Drift Compensation feature where surrounding frames are used to decrease tracker drift.

# Undo

## Max Undo Events

Sets the maximum number of undos.

## User Interface

### Allow Nested Docks

Allows all nested docks to be moved at the same time. Disabling this preference moves individual docks only.

### Automatically Raise Dock Preference

Added a User Interface > Automatically Raise Dock Views On Selection Change preference. For instance, when the Paint node is selected, relevant tabs like the Paint History automatically appear.

### Check for New Versions

Checks for new versions and displays an alert on startup.

### Colored Timeline Tracks

Colors the timeline tracks the same as the Roto node's shape colors.

### Invert Mouse Wheel in Editors

Inverts the numerical direction when adjusting sliders with the mouse wheel.

### Show Object Properties on Selection

When you select an item in the Object List, the controls for that item are automatically shown in the Parameters window. If you select an item in the Node List, the controls for that item are automatically shown in the Node window. This behavior can be disabled with this preference.

### Show What's New After Installing A New Version

On startup, if this is the first time launching a new version of Silhouette, it will open the What's New. It will only do this once.

## Viewer

### Alpha Overlay Color

Sets the color of the alpha overlay.

### Anchor Color

Sets the color of the Transform tool anchor point.

### Anti-Alias Overlay Controls

Anti-aliases lines and overlay controls.

### Auto-Show Overlay

If Overlay is turned off, Auto-Show Overlay automatically turns Overlay back on when clicking in the Viewer.

### Background Color

Sets the border color in the Viewer.

### Display ROI Outline

Displays the ROI outline.

### Handle Mode

Controls how handles are drawn.

#### **Blend**

Uses a normal blend mode to display layer and shape handles.

#### **XOR**

Uses an XOR blend mode to display layer and shape handles.

### Layer Transform Color

Sets the color of the layer's on-screen controls.

### Line Width

Sets the thickness of overlay lines.

## Mask Fill Color

### Color

Sets the color of the mask.

### Opacity

Set the opacity of the Mask Fill Color by clicking on the percentage field (to the right of the color picker) and typing in a new number.

## Mask Outline Color

### Color

Sets the color of the mask outline.

### Opacity

Set the opacity of the Mask Outline Color by clicking on the percentage field (to the right of the color picker) and typing in a new number.

## Picking Tolerance

Sets the radius of the threshold for picking points.

## Premultiply Background Color

Sets the background color for premultiplied display modes. You can premultiply the image in the Viewer by using **Shift-0**.

## Restore Focus After Editing preference

Restores focus to the viewer after editing parameters. This ensures that the arrow keys, for instance, continue to work for nudging objects.

## Synchronize Viewers

Synchronizes the zoom and pan of multiple viewers from the same node.

Synchronization is one way from the main viewer to the additional viewers.

## Template Mode

Turns template mode on or off. See [Template Color](#) for more information.

## Zoom Factor

Controls the **I/O** zoom factor keyboard shortcuts. Default is 2. Range is 1.05 > 2.0.

## Zoom Filter

### Linear

Interpolates pixels when zoomed into the image. This results in a smoother, but softer image.

### Nearest

Replicates pixels when zoomed into the image. This results in a sharper, but chunkier image.



# KEYBOARD SHORTCUTS

## Paint

### Brushes

<b>Shortcut</b>	<b>Action</b>
<b>B</b>	Selects the Black and White brush
<b>Shift-B</b>	Selects the Blemish brush
<b>Ctrl/Cmd-B</b>	Selects the Blur brush
<b>Alt-Shift-B</b>	Selects the Burn brush
<b>C</b>	Selects the Clone brush
<b>Shift-C</b>	Selects the Color brush
<b>Alt-C</b>	Selects the Color Correct brush
<b>Alt-Shift-C</b>	Selects the Cutout brush
<b>Alt-D</b>	Selects the Detail brush
<b>Alt-Shift-D</b>	Selects the Dodge brush
<b>D</b>	Selects the Drag brush
<b>Shift-E</b>	Selects the Eraser brush
<b>G</b>	Selects the Grain brush
<b>M</b>	Selects the Mosaic brush
<b>R</b>	Selects the Repair brush
<b>Shift-S</b>	Selects the Scatter brush
<b>S</b>	Selects the Stroke tool

## Clone > Pin Warp

<b>Shortcut</b>	<b>Action</b>
Click-drag on image	Creates a pin
Click-release on image	Creates a tack
Click-drag pin (source or target)	Moves the pin (source or target)
<b>Shift</b> -drag pin (source or target)	Moves both pins (source and target)
<b>Ctrl/Cmd</b> -drag pin radius	Adjusts pin radius with all radii displayed
<b>Hover over pin, Shift</b> -drag pin radius	Adjusts pin radius with only selected pin radius displayed
<b>Alt</b> -drag on a tack	Converts a tack to a pin
Right-click > Remove Pin	Deletes the pin
Right-click > Make Tack	Converts a pin to a tack

## Clone > Region

<b>Shortcut</b>	<b>Action</b>
Click and drag	Creates a region
<b>Alt</b> -click and drag	Creates new region when one already exists
Click and drag inside a region	Moves the region
Drag the region handles	Resizes the region
Tap outside a region box without dragging	Resets the region to full screen

## Clone > Transform Keyboard Shortcuts

<b>Shortcut</b>	<b>Action</b>
<b>Q</b>	Activates / Deactivates translation of the clone source
<b>W</b>	Activates / Deactivates rotation of the clone source
<b>E</b>	Activates / Deactivates scaling of the clone source
<b>Q, W, E then Ctrl/Cmd</b>	Translates, Rotates or Scales in finer increments
<b>Ctrl/Cmd-W</b>	Rotates without setting the anchor point
<b>Ctrl/Cmd-E</b>	Scales without setting the anchor point
<b>Ctrl/Cmd-1-4</b>	Selects the top left, top right, bottom right and bottom left corner points so they can be moved
<b>. (Period key)</b>	Sets the anchor point

## Clone > Transform Nudging

<b>Shortcut</b>	<b>Action</b>
<b>Arrow keys</b>	Moves the clone source by 1 pixel
<b>Shift-Arrow keys</b>	Moves the clone source by 10 pixels
<b>Ctrl/Cmd-Arrow keys</b>	Moves the clone source by one tenth of a pixel
Hold down <b>Arrow keys</b>	Moves the clone source continuously
<b>Q, W, E then Arrow keys</b>	Translates, Rotates or Scales by 1 pixel
<b>Q, W, E then Shift-Arrow keys</b>	Translates, Rotates or Scales by 10 pixels
<b>Q, W, E then Ctrl/Cmd-Arrow keys</b>	Translates, Rotates or Scales by 1/10 of a pixel
<b>Ctrl/Cmd-1 then Arrow Keys</b>	Nudges the top left corner point
<b>Ctrl/Cmd-2 then Arrow Keys</b>	Nudges the top right corner point
<b>Ctrl/Cmd-3 then Arrow Keys</b>	Nudges the bottom right corner point
<b>Ctrl/Cmd-4 then Arrow Keys</b>	Nudges the bottom left corner point

## Clone > Transform On-Screen Controls

<b>Shortcut</b>	<b>Action</b>
Drag within large center circle	Moves the clone source
<b>Shift</b> -drag within large center circle	Constrain clone source movement horizontally or vertically
Drag the center square horizontal and vertical halfway points	Scales the clone source horizontally or vertically
Drag a center square corner	Proportionally scale the clone source
Drag large center circle	Rotate the clone source
<b>Ctrl/Cmd</b> -drag large center circle	Rotates the clone source with finer control
Drag handles on corners of image	Corner-pins the clone source
Drag dash above large circle	Skews the clone source horizontally
Drag dash to the right of large circle	Skews the clone source vertically

## Clone > Transform On-Screen Controls With Region Set

<b>Shortcut</b>	<b>Action</b>
Drag within region	Moves the clone source
<b>Shift</b> -drag region	Constrains the clone source movement horizontally or vertically
Drag edge handle	Scales the clone source horizontally or vertically
<b>Shift</b> -drag corner or edge handle	Proportionally scale the clone source
<b>Ctrl/Cmd</b> -drag on corner handle	Rotate the clone source / Continue holding <b>Ctrl</b> to adjust with finer control
Drag on a corner handle	Corner-pins the clone source
<b>Ctrl/Cmd</b> -drag on edge handle	Skews the clone source

## Cutout Brush

<b>Shortcut</b>	<b>Action</b>
Click-drag	Creates a source region when none exists
<b>Shift</b> -drag or Right-click-drag	Creates a new source region
<b>Shift</b>	Displays source region
<b>Shift</b> -click or Right-click	Resets source region
<b>Ctrl/Cmd</b> -drag boundary	Scales the cutout
<b>Ctrl/Cmd-Shift</b> -drag boundary	Rotates the cutout

## Settings

<b>Shortcut</b>	<b>Action</b>
<b>Ctrl/Cmd</b> -drag left/right	Sizes the brush
[ and ]	Sizes the brush
<b>Ctrl/Cmd-Shift</b> -drag	Sets the brush softness
<b>Shift-Alt-1</b> and <b>Shift-Alt-2</b>	Selects the Dual Clone brush setups
<b>Shift+Ctrl+1</b>	Toggle Dual Clone mode on/off
‘ (located to the left of 1 key)	Displays the Clone source and then the Clone target so that you can click on each to set the Clone offset
<b>Caps Lock</b>	Toggles Onion Skin mode on and off
▪ (period key)	Picks colors off of the screen
Right-click	Picks a color off of the screen from a single pixel
Right-click-drag	Picks a color off of the screen by drawing a box and averages the colors within it
<b>Alt</b> -click-click	Draws a straight line
<b>Alt-S</b>	Toggles between Paint Source > Foreground or Output
key (vertical bar)	Snaps the vertical or horizontal split compare position to the cursor position

## View Menu

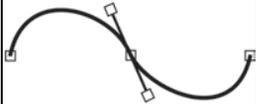
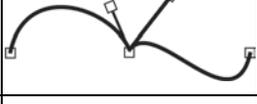
<b>Shortcut</b>	<b>Action</b>
<b>1</b>	View the Output
<b>2</b>	View the Foreground
<b>3-7</b>	View Input's 1-5
<b>8</b>	View Color Layer
<b>9</b>	View Detail Layer
<b>P</b>	View Paint Only

# Roto

## Tools

<b>Shortcut</b>	<b>Action</b>
<b>T</b>	Selects Transform Shape Mode
<b>TT</b>	Selects Transform Points Mode
<b>R</b>	Selects Reshape Normal Mode
<b>RR</b>	Selects Reshape Magnet Mode
<b>Y</b>	Selects IK (Inverse Kinematics)
<b>B</b>	Selects B-Spline
<b>S</b>	Selects X-Spline
<b>Shift-B</b>	Selects Bézier
<b>Shift-F</b>	Selects Magnetic Freehand
<b>Shift-S</b>	Selects Square
<b>Shift-C</b>	Selects Circle
<b>Shift-T</b>	Selects Tracker
<b>M</b>	Selects MultiFrame
<b>Shift-O</b>	Selects RotoOverlay
<b>Alt-F</b>	Toggles the shape feather handle on/off
<b>Alt-K</b>	Adds weighted keyframe

## Bézier Splines

Shortcut	Action	Curve
No key needed	Adjust the length of one tangent while retaining a fixed angle between two tangents	
Ctrl/Cmd	Adjust both tangents simultaneously while retaining a fixed angle between two tangents	
Alt	Adjusts only one tangent to create corners	
Shift	Adjusts only the length of one tangent (similar to the “No key needed” shortcut)	
Ctrl/Cmd-Alt-1	Sets the point tension to Corner	
Ctrl/Cmd-Alt-2	Sets the point tension to Cardinal	

## B-Spline Shapes

Shortcut	Action
Alt-drag control point right	Creates a corner point
Alt-drag control point left	Creates a smooth point
Alt-clicking control point	Cycles through the preset weight settings of the point
Ctrl/Cmd-Alt-1	Sets the point tension to Corner
Ctrl/Cmd-Alt-3	Sets the point tension to B-Spline

## Cut / Copy / Paste

<b>Shortcut</b>	<b>Action</b>
<b>Ctrl/Cmd-X</b>	Cuts an object
<b>Ctrl/Cmd-C</b>	Copies an object
<b>Ctrl/Cmd-V</b>	Pastes an object

## Feather

<b>Shortcut</b>	<b>Action</b>
<b>Alt-F</b>	Toggles the shape feather handle on/off
<b>Shift-Drag Shape Point</b>	Moves shape and feather points simultaneously

## IK (Inverse Kinematics) Tool

<b>Action</b>	<b>Result</b>
Click-drag bone or shape	Rotates the shape around the parent's anchor point
Click-drag joint	Uses IK to rotate all joints up the chain
<b>Alt</b> -click-drag joint	Moves the joint but tries to keep other joints in place
Right-click bone-Add Key	Sets keyframes for the selected bones

## Layer Transform On-Screen Controls

<b>Shortcut</b>	<b>Action</b>
Drag within large center circle	Moves the layer
<b>Shift</b> -drag within large center circle	Constrain layer movement horizontally or vertically
Drag the intersection of the center square and the horizontal and vertical lines	Scales the layer horizontally or vertically
Drag the center square corner	Proportionally scale the layer
Drag large center circle	Rotate the layer
<b>Ctrl/Cmd</b> -drag large center circle	Rotates the layer with finer control
Drag handles on corners of image	Corner-pins the layer
Drag small center circle	Moves the Anchor point
<b>Q</b>	Activates / Deactivates translation of selected layers
<b>W</b>	Activates / Deactivates rotation of selected layers
<b>E</b>	Activates / Deactivates scaling of selected layers
<b>Q, W, E</b> then <b>Ctrl/Cmd</b>	Translates, Rotates or Scales in finer increments

## Magnetic Freehand Shapes

### Tracing

<b>Shortcut</b>	<b>Action</b>
<b>Click while tracing</b>	Anchors the currently drawn path by adding a shape point
<b>Shift-click</b>	Draws a straight line between the new and previous shape points

### Stroke Marking

<b>Shortcut</b>	<b>Action</b>
<b>Shift-click-drag</b>	Creates a foreground stroke
<b>Alt-click-drag</b>	Creates a background stroke
<b>Esc</b>	Clears foreground and background strokes / Deselects current shape

## Nudging

<b>Shortcut</b>	<b>Action</b>
<b>Arrow</b> keys	Moves by 1 pixel
<b>Shift-Arrow</b> keys	Moves by 10 pixels
<b>Ctrl/Cmd-Arrow</b> keys	Moves by one tenth of a pixel
Hold down <b>Arrow</b> keys	Moves continuously
<b>Q, W, E</b> then <b>Ctrl/Cmd</b> -drag	Translates, Rotates or Scales in finer increments
<b>Q, W, E</b> then <b>Arrow</b> keys	Translates, Rotates or Scales by 1 pixel
<b>Q, W, E</b> then <b>Shift-Arrow</b> keys	Translates, Rotates or Scales by 10 pixels
<b>Q, W, E</b> then <b>Ctrl/Cmd-Arrow</b> keys	Translates, Rotates or Scales by 1/10 of a pixel

## Object List

<b>Shortcut</b>	<b>Action</b>
Click on an object	Selects the object
<b>Shift</b> -click an object	Adds an object to the current selection
<b>Ctrl/Cmd</b> -click on an object	Toggles the object selection
<b>Shift</b> -click color pot	Selects shapes of same color
<b>Alt</b> -click the Visibility icon	Solos an object
<b>Alt-Ctrl/Cmd</b> -click the Visibility icon	Forces the visibility of all objects to the on position
<b>Shift</b> -click the +/- icon	Expands or collapses all nested layers inside that layer
Double-click an object	Selects the object so it can be renamed

## Selecting / Deselecting Control Points

Shortcut	Action
Click on a control point. If the control point is part of a Bézier curve, its tangents appear	Selects the control point
<b>Shift</b> -click the control points or drag select multiple control points	Selects multiple control points
<b>Ctrl/Cmd</b> -drag in the Viewer to begin the selection. Once the selection is started, release <b>Ctrl/Cmd</b> and complete the selection	Freehand select multiple control points
<b>Ctrl/Cmd-Alt-I</b>	Inverts the point selection
<b>Alt-Shift-A</b>	Selects all control points
<b>Alt-Ctrl/Cmd-A</b>	Deselects all control points
<b>Ctrl/Cmd</b> -click on a control point	Toggles the point selection
Click anywhere off the shape	Deselects all control points

## Selecting / Deselecting Shapes

Shortcut	Action
Click on a shape	Selects the shape
<b>Shift</b> -click a shape or drag select multiple shapes	Selects multiple shapes
<b>Ctrl/Cmd</b> -click on a shape	Toggles the shape selection
Click anywhere off the shape	Deselects all shapes
<b>Shift</b> -click color pot in the Object List	Selects shapes of same color

## Tracker

Shortcut	Action
<b>Alt</b> -click in Viewer	Creates a new tracker

## Transform Tool

Shortcut	Action
Drag shape	Moves the shape
<b>Shift</b> -drag shape	Constrain shape movement horizontally or vertically
Drag bounding box corner or edge handle	Scales a shape
<b>Shift</b> -drag bounding box corner or edge handle	Proportionally scale a shape
<b>Ctrl/Cmd</b> -drag on a bounding box corner handle	Rotate a shape
<b>Alt</b> -drag on a bounding box corner handle	Corner-pin a shape
<b>Alt-Shift</b> -drag on a bounding box corner handle	Constrains the corner-pin movement to one axis
<b>Ctrl/Cmd</b> -drag on a bounding box edge handle	Shear a shape
<b>.</b> (period key)	Turns the Anchor Point on or off
Drag on Anchor Point	Moves the Anchor Point
<b>Shift-.</b> (period key)	Moves the Anchor Point to the mouse location
<b>Q</b>	Activates / Deactivates translation of selected shapes or layers
<b>W</b>	Activates / Deactivates rotation of selected shapes or layers
<b>E</b>	Activates / Deactivates scaling of selected shapes or layers
<b>Q, W, E</b> then <b>Ctrl/Cmd</b>	Translates, Rotates or Scales in finer increments
<b>Ctrl/Cmd-W</b>	Rotates without setting the anchor point
<b>Ctrl/Cmd-E</b>	Scales without setting the anchor point

## Transform On-Screen Controls



<b>Shortcut</b>	<b>Action</b>
Drag small center cross	Moves the image's X/Y Position
Drag on the large cross's horizontal and vertical lines	Scales the image horizontally or vertically
Drag large center circle	Proportionally scales the image
Drag small circle at 3 o'clock position	Rotates the image
Drag crosses on corners of image	Corner-pins the image
Drag bars at 9 and 12 o'clock positions	Shears the image
<b>Alt-click-drag</b>	Moves the anchor point to a different area of the image

## X-Spline Shapes

<b>Shortcut</b>	<b>Action</b>
<b>Alt-drag control point right</b>	Adjusts the weight of the point from Cardinal to Corner to B-Spline
<b>Alt-drag control point left</b>	When the weight is set to B-Spline, it adjusts the weight of the point from B-Spline to Corner to Cardinal
<b>Alt-clicking control point</b>	Cycles through preset weight settings of the point
<b>Ctrl/Cmd-Alt-1</b>	Sets the point tension to Corner
<b>Ctrl/Cmd-Alt-2</b>	Sets the point tension to Cardinal
<b>Ctrl/Cmd-Alt-3</b>	Sets the point tension to B-Spline
<b>Alt-S</b>	Snap selected control points to the nearest detectable edge
<b>Drag Points-Hold Alt-S</b>	Snap selected control points to the nearest detectable edge

## View Menu

<b>Shortcut</b>	<b>Action</b>
<b>1</b>	View the Output
<b>2</b>	View the Foreground
<b>3</b>	View the Background
<b>4</b>	View the Color Comp
<b>5</b>	View Composite
<b>6</b>	View Channels

# Timeline

<b>Shortcut</b>	<b>Action</b>
Scroll wheel	Zooms the Timeline in and out
<b>Shift</b> -Middle-mouse drag	Zooms the Timeline in and out
<b>Space Bar</b> -move mouse	Pans the Timeline
<b>Middle</b> -mouse drag	Pans the Timeline
Single-click keyframe	Selects one keyframe
<b>Ctrl/Cmd</b> -click keyframe	Toggle the keyframe selection
<b>Shift</b> -click keyframes	Selects a range of keyframes
<b>Alt</b> -click	Inserts a keyframe
Right-click keyframe	Opens Timeline pop-up menu
Click-drag keyframe	Moves the keyframe
<b>Ctrl/Cmd</b> -drag the ends of work range bar	Changes the start and end of the work range
<b>Ctrl/Cmd</b> -drag the work range bar	Slides the work range forward and back
Click top left corner of the Timeline	Centers the timeline on the current frame

## Curve Editor

<b>Shortcut</b>	<b>Action</b>
<b>Alt</b> -click on curve	Inserts a point on the curve
Click-drag curve point	Moves the curve point
+ or =	Zooms the Curve Editor in
-	Zooms the Curve Editor out
<b>Space Bar</b> -move mouse	Pans the Curve Editor
Hover cursor over curve	Displays the current curve value
Right-click curve point	Opens Curve pop-up menu

# Viewer

## General

<b>Shortcut</b>	<b>Action</b>
<b>F1</b>	The composite workspace is displayed
<b>F2</b>	The Viewer is displayed full screen
<b>F3</b>	The Viewer and Timeline are displayed
<b>F4</b>	The Viewer and Trees window are displayed
<b>F5</b>	The dual monitor workspace is displayed
<b>0</b>	Toggles the display of overlays which are lines, shapes or objects
<b>1-7 (Number Keys)</b>	Switches the Viewer > View menu
<b>~</b>	Cycles through the update modes
<b>A</b>	Cycles the display between the full color image, the alpha channel superimposed over the image, and the alpha channel by itself
<b>Shift-A</b>	Toggles the View to Output, superimposes the alpha channel over the image and deactivates the Overlay
<b>Alt-R/G/B/A</b>	Toggles the red, green, blue and alpha channels on and off
<b>Alt-O</b>	Toggles the Roto node's view mode to Output and displays the alpha. Pressing <b>Alt-O</b> again returns the Viewer to its previous state.
<b>Shift-Ctrl/Cmd-R</b>	Toggles the Viewer rotation mode on/off
<b>Shift-R</b>	Toggles the Viewer rotation editing mode on/off
<b>Shift-0</b>	Premultiplies the image in the Viewer by the alpha
<b>Alt-]</b>	Cycles to next node in the Node pop-up menu

## Pan/Zoom

<b>Shortcut</b>	<b>Action</b>
Middle-mouse drag	Pans the image
<b>Space Bar</b> -move mouse	Pans the image
+ or =	Zooms the image in
-	Zooms the image out
<b>Shift</b> -Middle-mouse drag	Zooms the image in and out
Scroll wheel	Zooms the image in and out
<b>Space Bar-Shift</b> -move mouse up/down	Zooms the image in and out
<b>F</b>	Fits the image in the Viewer
<b>H</b> or Middle-mouse double click	Centers the image in the Viewer at 100%
<b>Ctrl/Cmd-F</b>	Centers selected object in the Viewer
'	Opens a context menu over pen/mouse location

## Playback Controls

<b>Shortcut</b>	<b>Action</b>
<b>Z</b>	Step backward 1 frame
<b>Shift-Z</b>	Moves to the previous keyframe
<b>X</b>	Step forward 1 frame
<b>Shift-X</b>	Moves to the next keyframe
<b>J</b>	Plays backward
<b>K</b>	Stops or starts playback
<b>L</b>	Plays the forward
<b>Space Bar</b>	Stops playback
<b>Home</b>	Moves to the first frame
<b>End</b>	Moves to the last frame
Click and drag in the shuttle area	Shuttles through the clip
<b>Shift-Alt</b> -click and drag a keyframe marker	Moves the keyframe in time

## ROI

<b>Shortcut</b>	<b>Action</b>
<b>Initial click-drag bounding box</b>	Sets the ROI
<b>Click-drag bounding box points</b>	Scales the ROI
<b>Click-drag bounding box</b>	Positions the ROI
<b>Ctrl/Cmd-Shift-drag</b>	Draws a new ROI

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July 15, 2018

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# libz

## License

zlib.h -- interface of the 'zlib' general purpose compression library

version 1.2.11, January 15th, 2017

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yaml-cpp

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# xml.io

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Version 2.1, February 1999

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