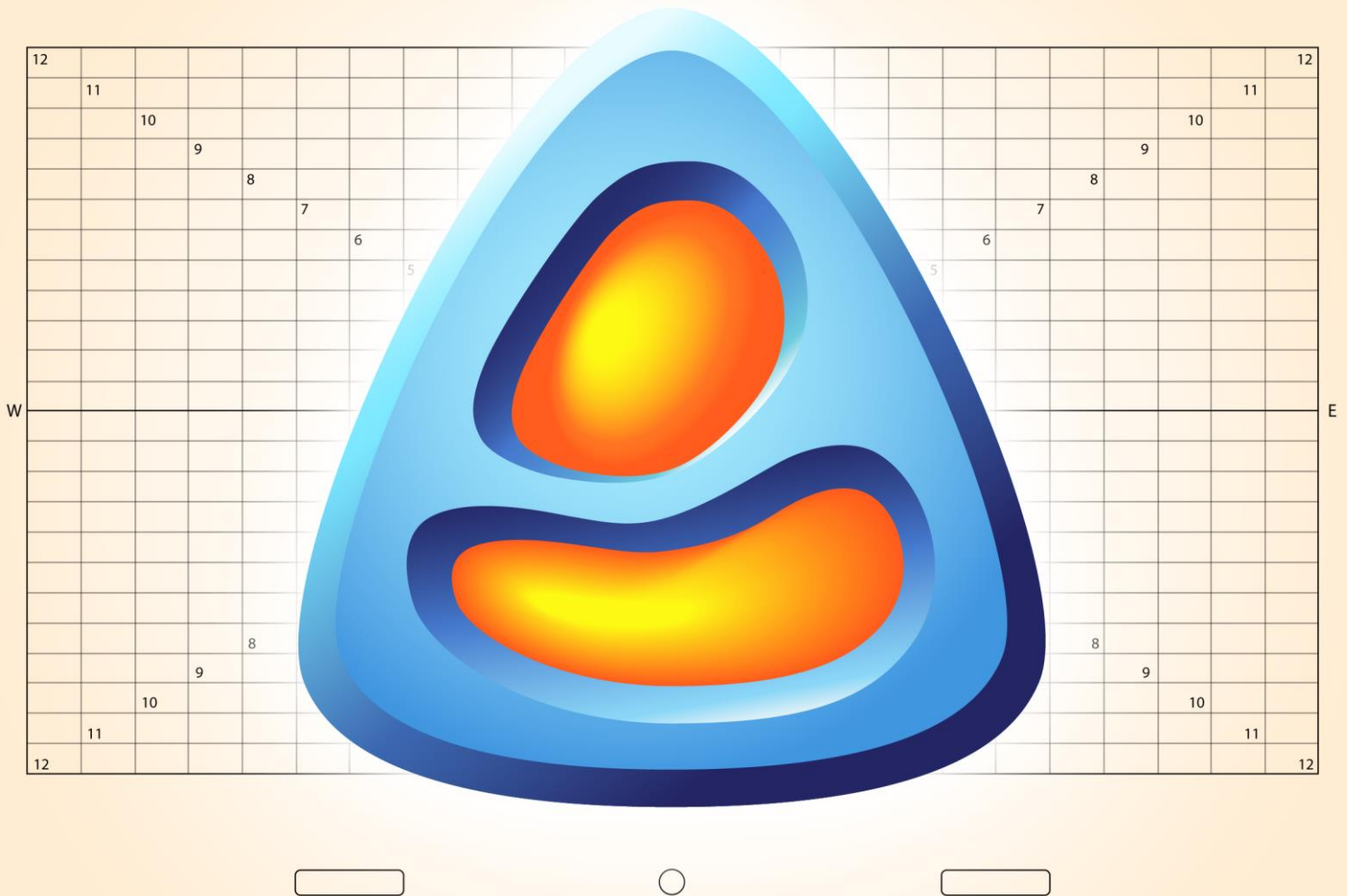


CACANi

A New Era for Traditional Animation

User Manual



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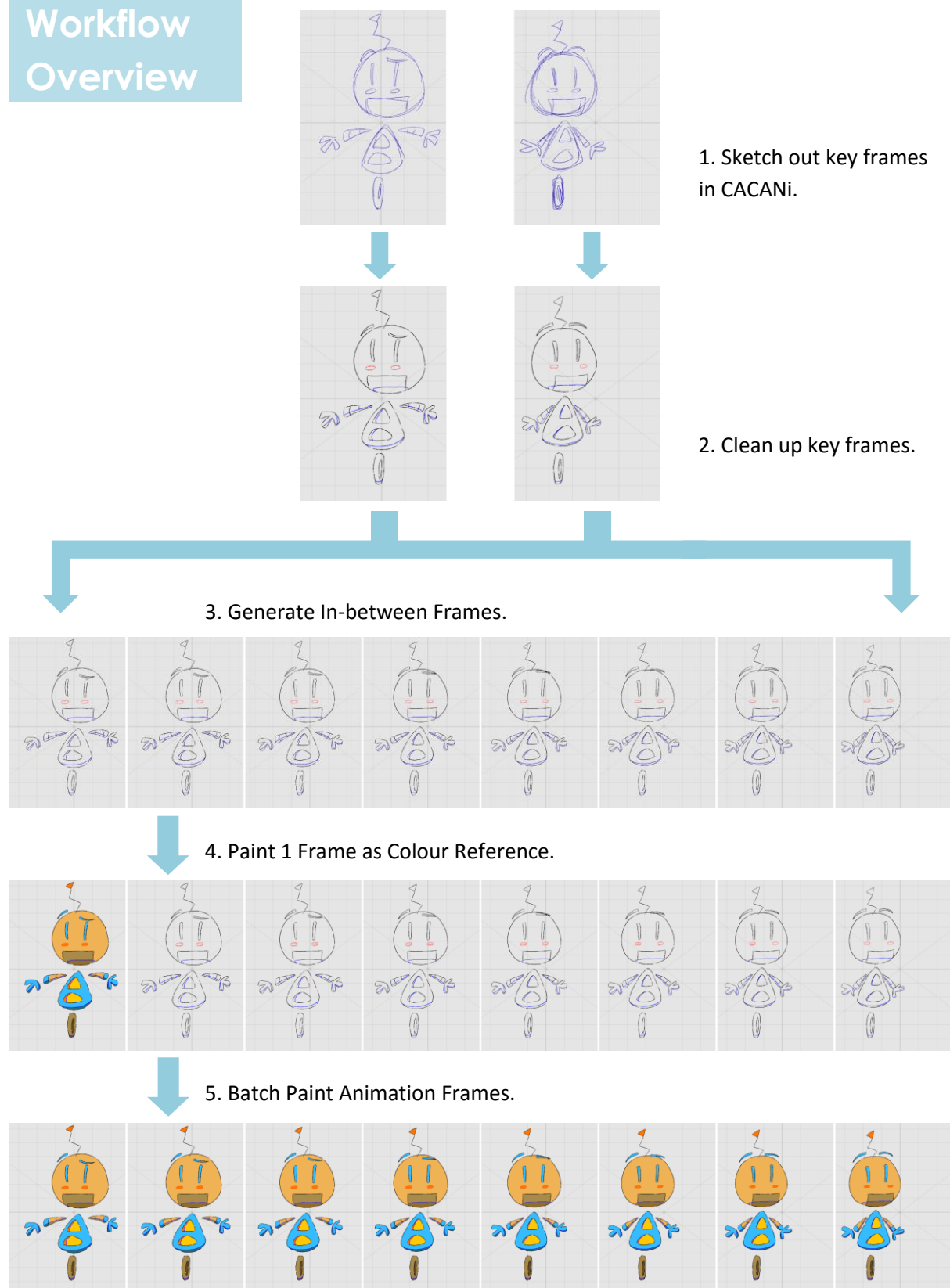
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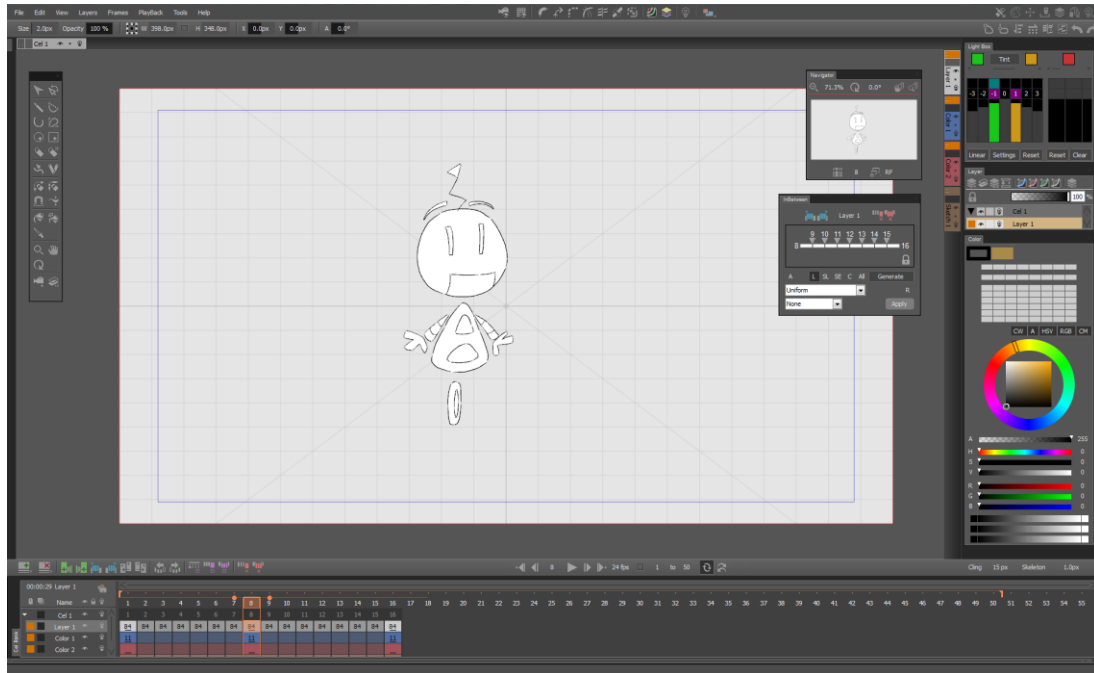
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01

What is **CACANi**?

CACANi's Animation Workflow Overview





CACANi is a revolutionary application developed with hand drawn animators in mind. With our proprietary tools and workflow, CACANi helps reduce the work required by generating in-between frames based on the key frames and automatically painting the frames, creating a smooth and realistic animation sequences in a fraction of the time.

Features of CACANi

- **Unique Pressure Sensitive Sketching and Tracing Capabilities**

With the use of graphic tablets or tablet displays, animators can choose to create their drawings with clean, uniform lines, or organic, pressure-sensitive strokes, directly in the software.

- **Colour Separation Line Layers**

To add more depth to the drawings, Colour Separation Lines can be drawn to create highlight or shaded regions. These special layers can then be hidden so that the final painted drawings do not show the separation lines.

- **Automatic Generation of In-between Frames**

Animators can now make use of CACANi's unique animation engine to automatically generate in-between frames after the key frames are drawn.

- **In-between Timing Adjustments**

Mimicking the hand drawn animation workflow, in-between timing can be easily adjusted via the Timing Panel.

- **Automatic Colouring of Animation Frames**

Using a single painted frame as reference, painters can auto-colour all the frames of an animation sequence.

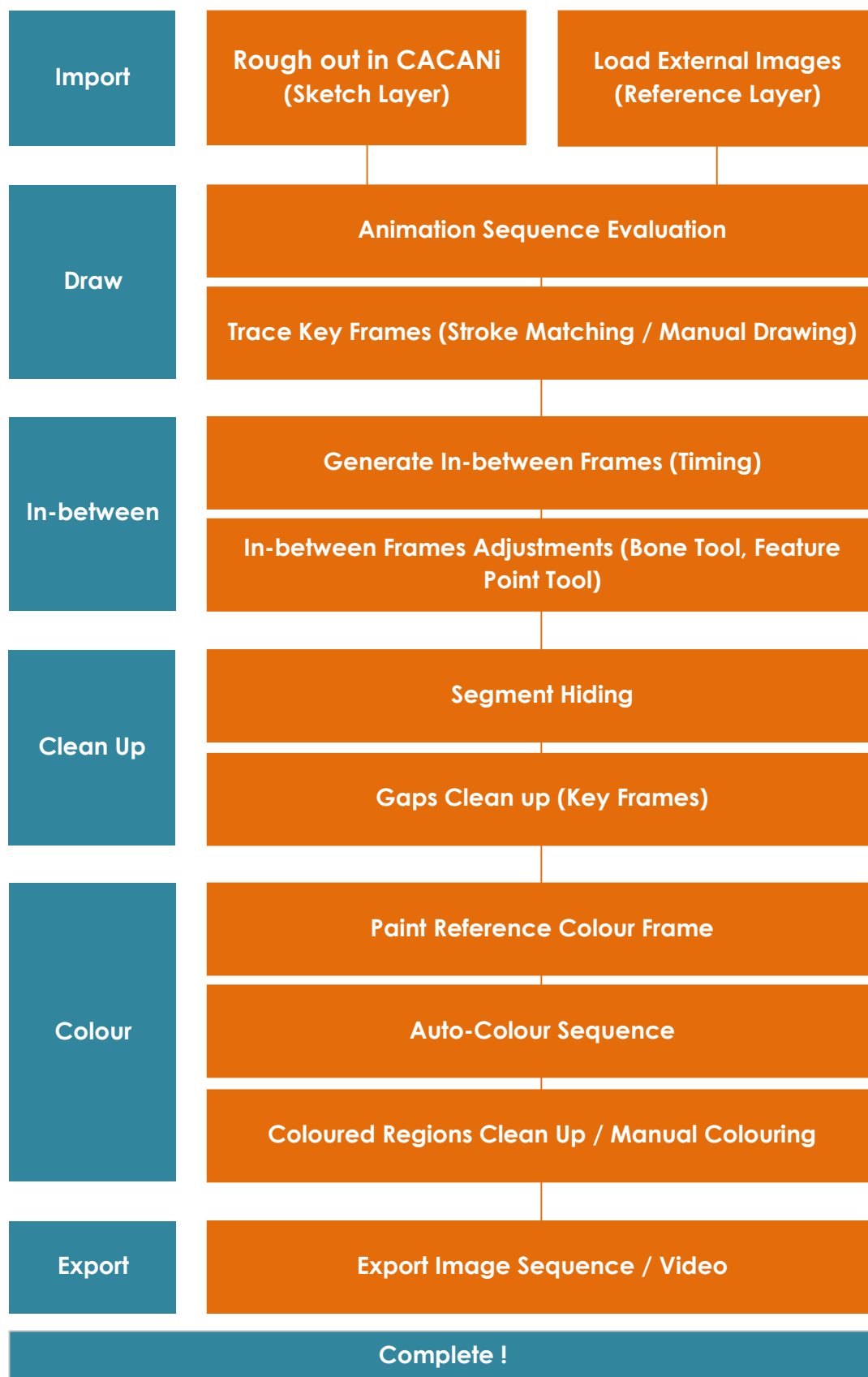
- **Unique Digital Workflow for Hand Drawn Animation**

We have developed an alternative digital production pipeline to make full use of the many advantages of CACANi. It will improve or eliminate several tedious processes that are traditionally required in the hand drawn animation industry.

- **High Quality, Scalable Vector Output**

CACANi is able to export animation sequence of any size and quality. Because all graphics are vector-based, CACANi gives artists the freedom to distribute their creations on multiple platforms with ease, from large HDTVs to mobile devices.

The CACANi Animation Pipeline



User Manual Icon Guide

Throughout the user manual, you will encounter some icons describing specific interactions that you'll need to perform with either the mouse or the digital stylus. They are listed as below:



Left Click

Press Left Mouse Button once (Mouse) or Tap Pen Tip on screen once (Stylus)



Left Click Twice

Press Left Mouse Button twice / Double Click (Mouse) or Tap Pen Tip on screen twice (Stylus)



Left Click + Drag

Press and Hold Down Left Mouse Button and Move in Indicated Direction (Mouse) or Press and Hold Down Pen Tip on screen and Move in Indicated Direction (Stylus)



Right Click

Press Right Mouse Button once (Mouse) or Press Pen Button once (Stylus)

System Requirements

Minimum Configuration

2 GHz Intel® / AMD® processor

Microsoft Windows XP

512 MB RAM

Video card supporting OpenGL 3.0 with at least 128 MB of RAM

Monitor with at least 1024x768 resolution

Mouse device

Recommended Configuration

3 GHz Intel® / AMD® processor

Microsoft Windows 7 / 8

At least 2 GB RAM

Video card supporting OpenGL 3.0 with at least 1 GB of RAM

Monitor with at least 1440x900 resolution

Graphics Tablet or Tablet Monitor device

Internet Connection will also be required for activation of software.

02

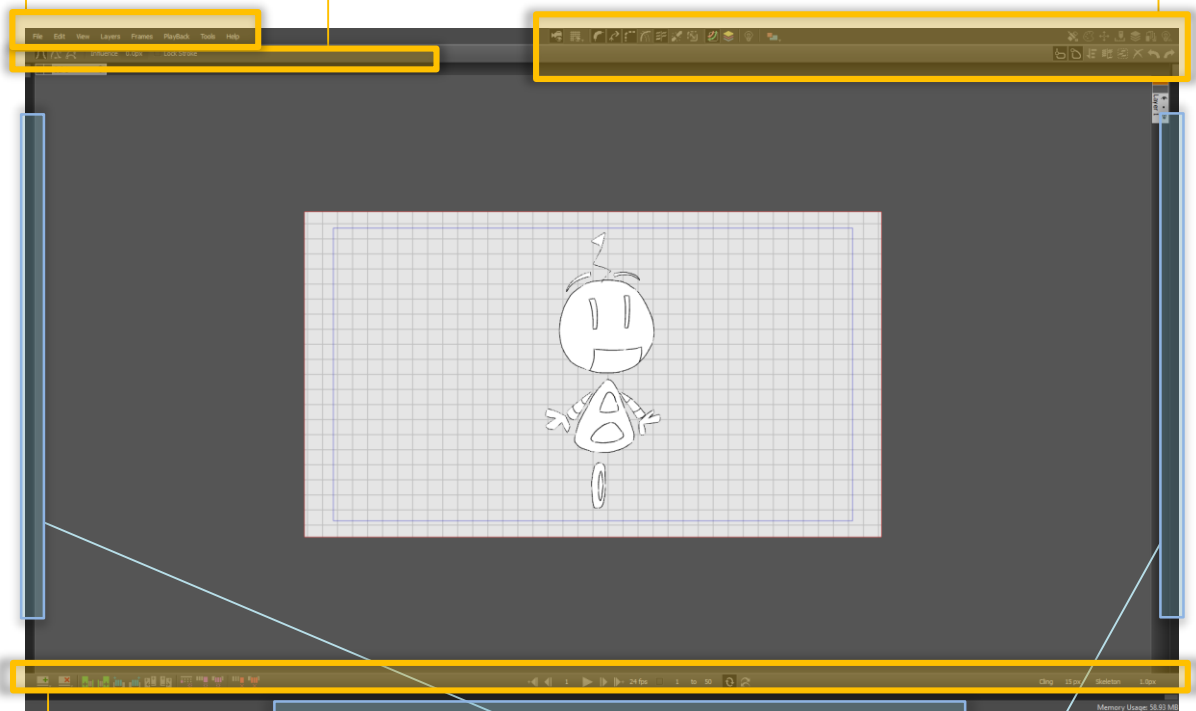
CACANi USER INTERFACE

Understanding CACANi's Interface

The Menu Bar is where you can find all the functions available in CACANi.

The Property Bar lists the properties of the various tools in the Tool Panel.

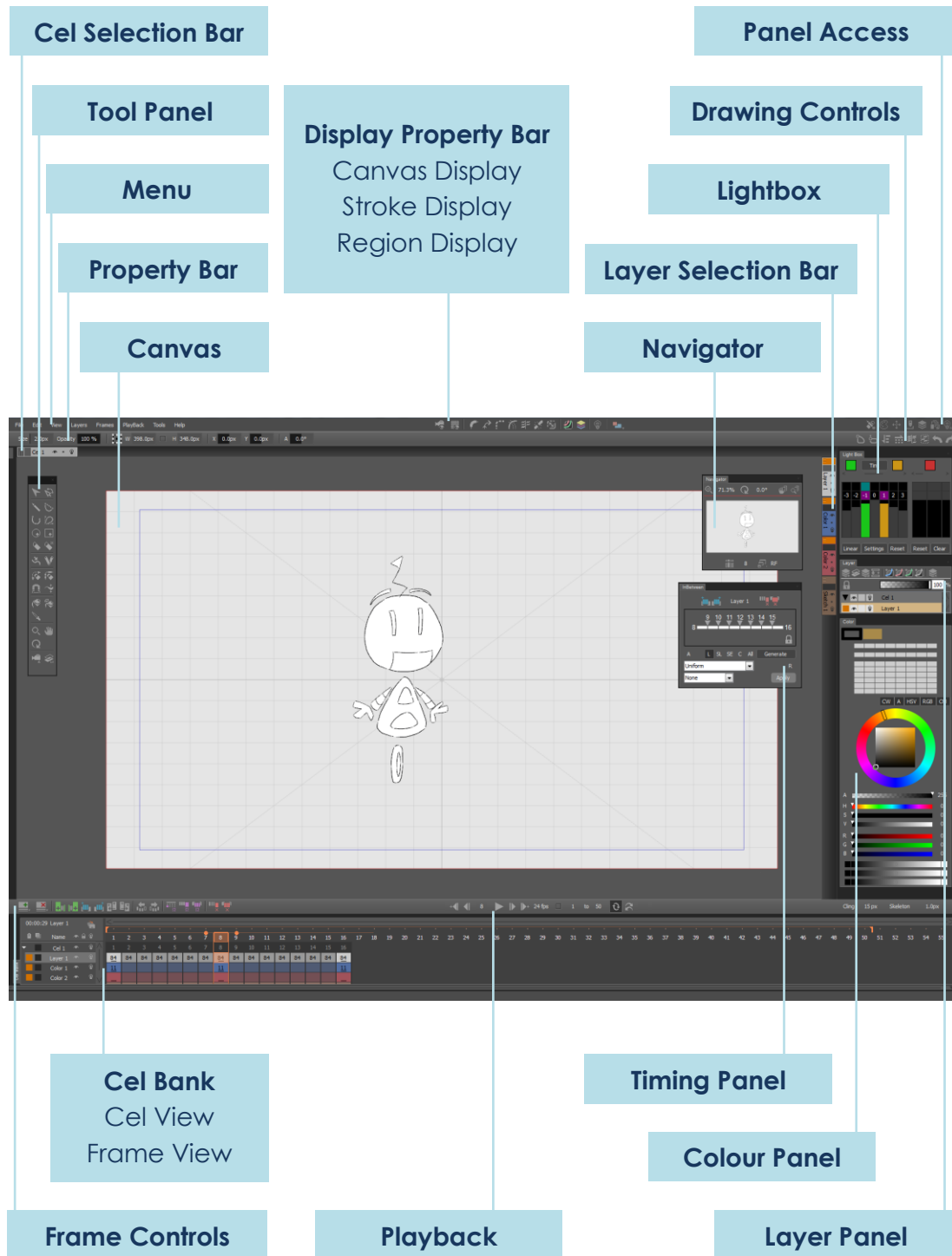
This is where you can find various controls for changing the display and behavior of tools and panels in CACANi.



This is where you can find additional controls for creating cels, frames and also playback your animation sequences in CACANi.

The docking areas at the bottom and sides of CACANi are where you can place your panels so that they do not obstruct your canvas.

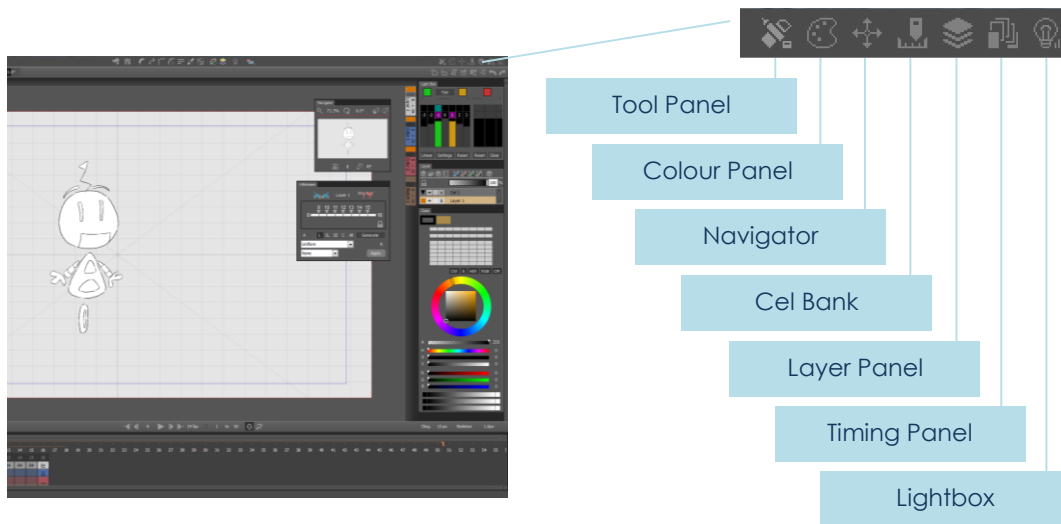
Interface Overview - Full



Interface Management

Panel Access Bar

In CACANi, the various tools for animation are placed in Panels, and these are displayed (or hidden) via the **Panel Access Bar**, located at the top right corner of the workspace.

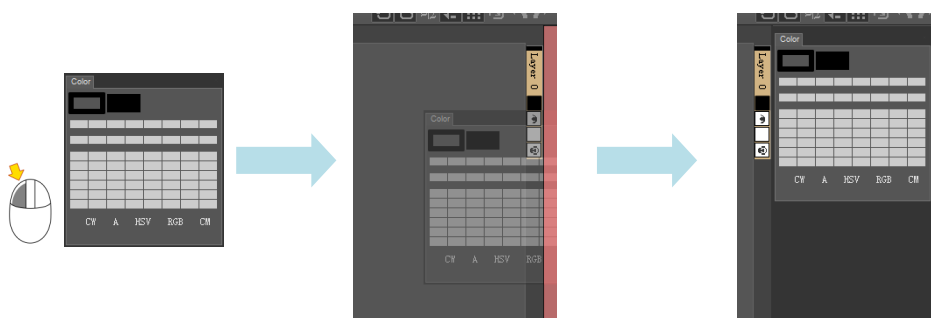


Panel Docking

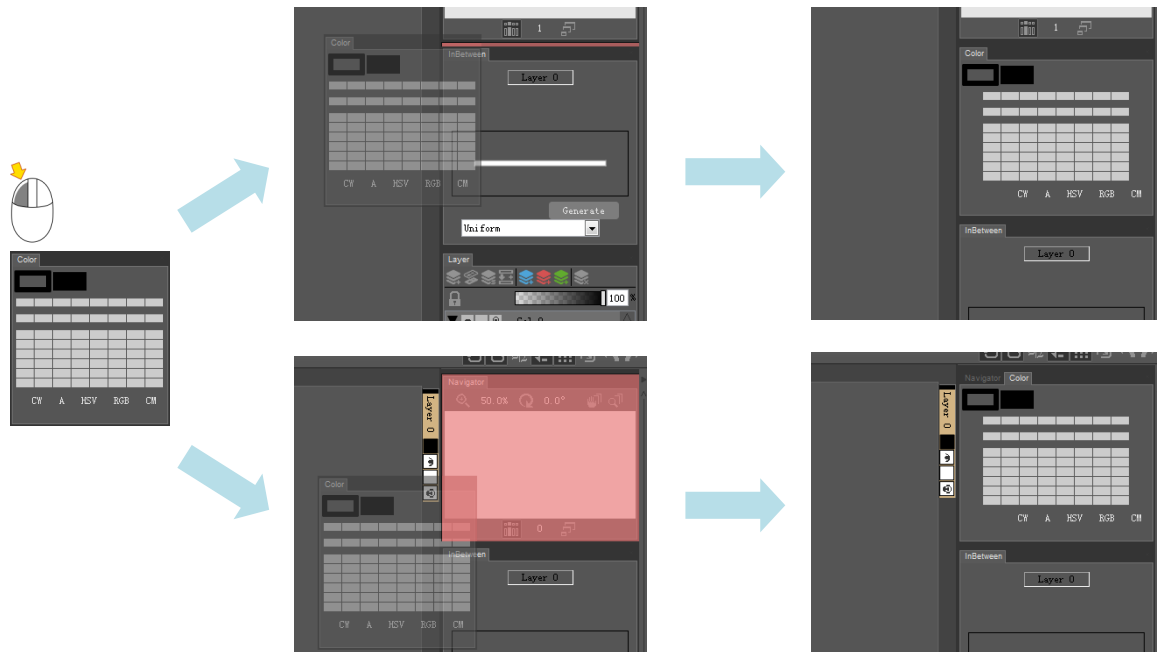
Based on user preferences, Panels can be arranged to be either free-floating or attached/docked to the sides of the workspace.

***Note that the Cel Bank is the exception: it can only be docked to the bottom.**

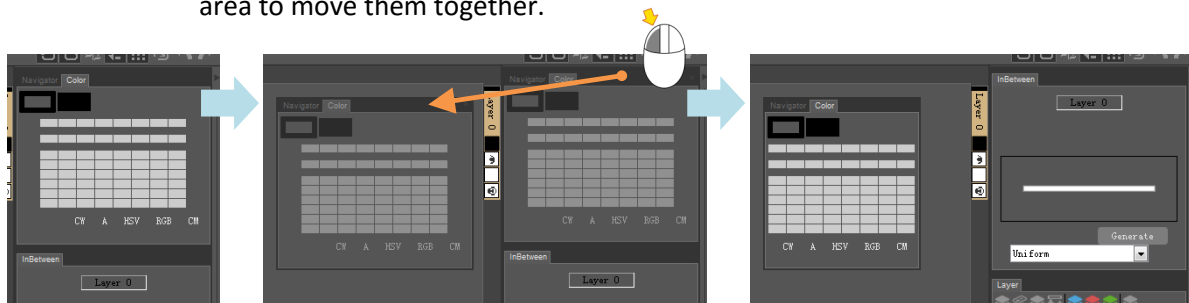
To dock a free-floating panel, drag it to the left, right, or bottom side of the workspace. The panel will snap into the enlarged dock area.



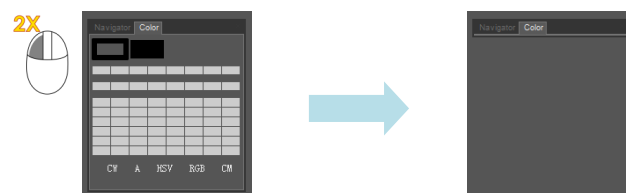
A panel can also be docked in between other panels, or docked behind another panel.



When multiple panels are docked horizontally, left click and drag the empty dock area to move them together.



Panels can be minimized by left-clicking twice on the panel tabs.

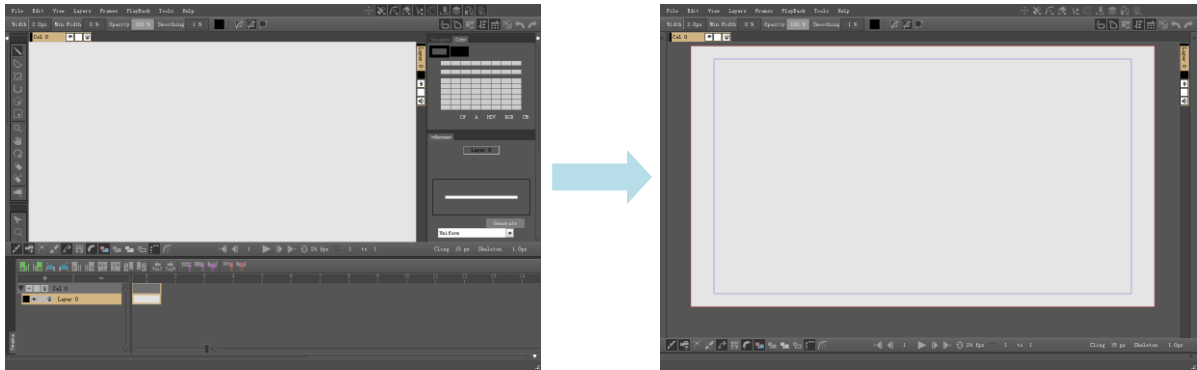


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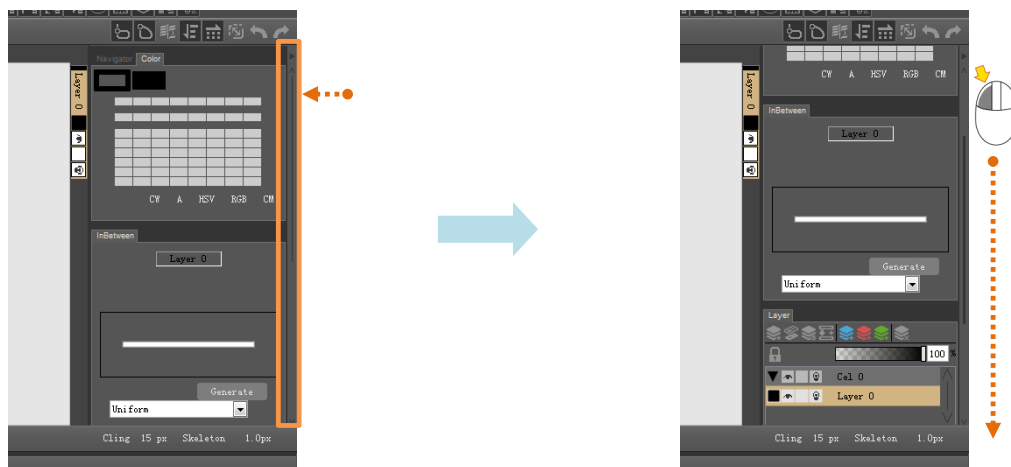
To close the panels, hover to the rightmost corner and left click on the 'X' icon.



The docking area can be minimized by left clicking on the docking arrows.



When there are too many docked panels, use the dock slider to navigate to the hidden panels.



Canvas Navigation

There are several manners in which the canvas can be manipulated to change its view; one can move the canvas vertically or horizontally, rotate the canvas, zoom in or out and flip the canvas horizontally or vertically.

Move around the Canvas

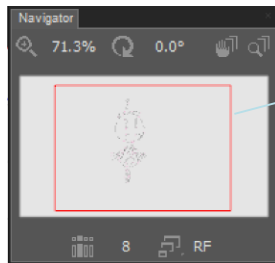


1. Select **Pan Tool** from the **Tools Panel**. On the canvas, tap and drag the stylus.

2. Press and hold **[Spacebar]**. Then on the canvas, tap and drag the stylus to pan.



3. Enable the **Navigator** from the **Panel Access Bar**. Tap and drag the stylus in the preview window.



The preview window shows a thumbnail view of the canvas

Magnification of Canvas



1. Select the **Magnifying Tool** from the **Tools Panel**. To zoom in, place the stylus on the canvas and drag to the right. Drag the stylus to the left to zoom out.

2. Press and hold **[Ctrl + Spacebar]**. On the canvas, tap and drag the stylus Left to Zoom Out of the canvas, and drag Right to Zoom In to the canvas.

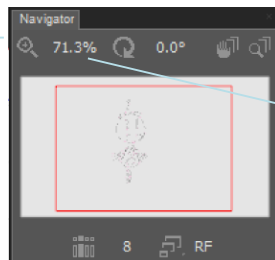
3. Press **[1]** to Zoom Out of the canvas, press **[2]** to Zoom In to the canvas.



4. Enable the **Navigator** from the **Panel Access Bar**. Use the Magnifying Tool, or type the magnification level in the input field.

Magnifying Tool

Tap and drag right to zoom into the canvas, drag left to zoom out of the canvas



Magnification Level

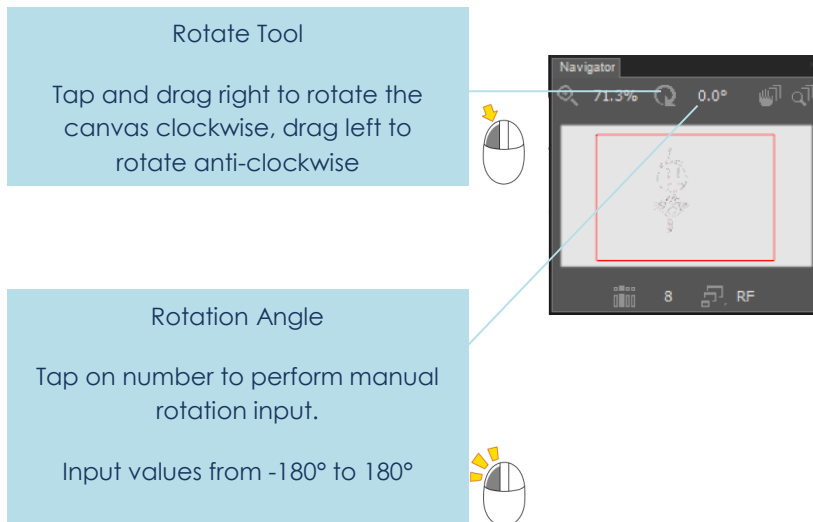
Tap on number for manual magnification level input.

Input values from 1.6% to 6400%

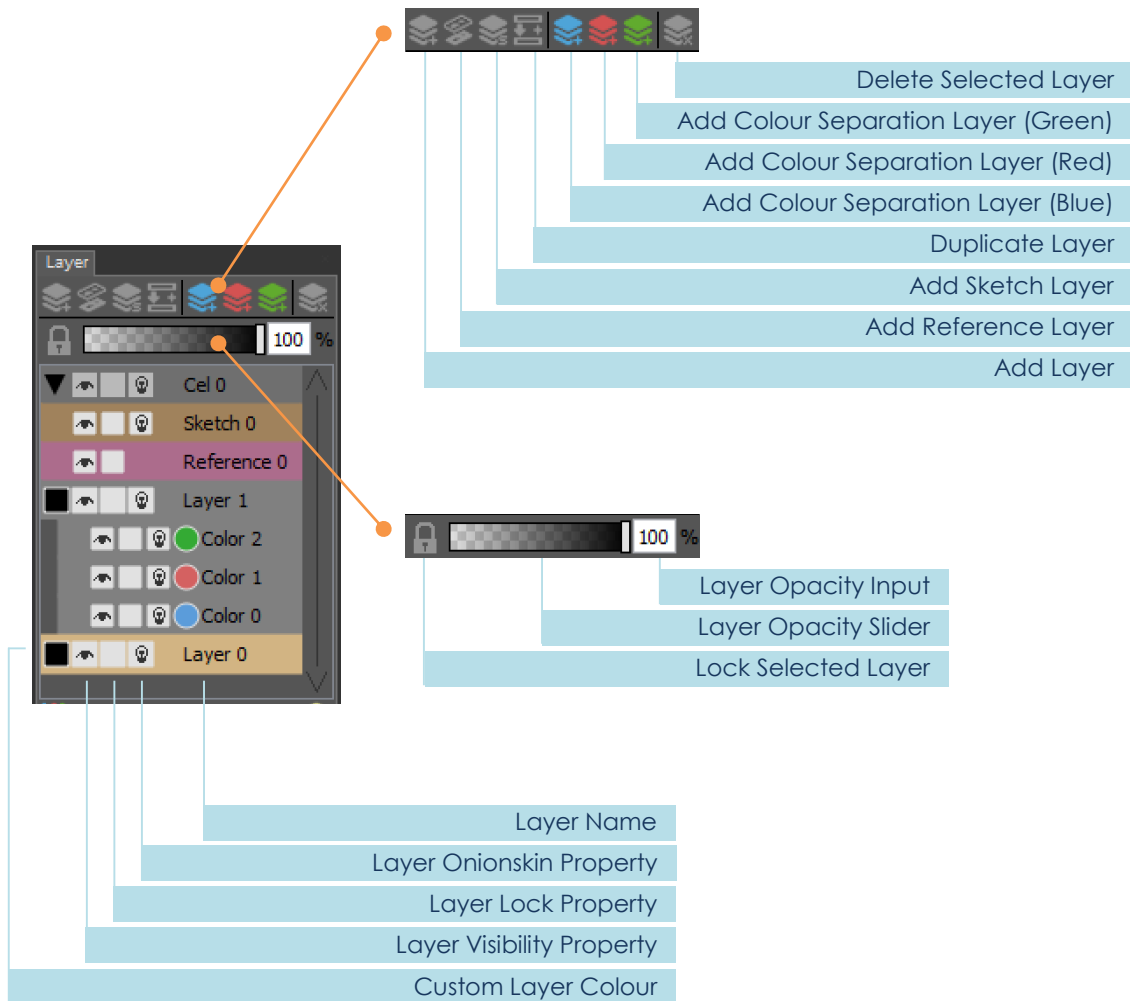


Canvas Rotation

1. Select **Rotate Tool** from the **Tools Panel**. Drag with the stylus on the canvas to rotate the canvas around the center point of the drawing workspace.
2. Press and hold [**SHIFT + Spacebar**]. On the canvas, tap and drag the stylus either Clockwise or Anti-Clockwise to rotate the canvas accordingly.
3. Press [**3**] to rotate the canvas anti-clockwise, press [**4**] to rotate the canvas clockwise.
4. Enable the **Navigator** from the **Panel Access Bar**. Use the Rotate Tool, or type the rotation angle in the input field.



Layer Panel



The **Layer Panel** provides another means of layer manipulation other than the **Cel Bank**. 1 more option is available in this panel as compared to the Cel Bank: Show Custom Layer Colour function.

To select a layer for drawing, simply tap / left click once on any layer. Stroke Colours are changed via the **Colour Panel**.

For the Colour Separation Layers, stroke colours are determined by the Colour Separation Colours.

***Note that it is not possible to draw on the Reference Layer.**

User Manual

Layer Panel Operations

To add a layer, simply press any of the Add Layer buttons in the **Layer Panel**.



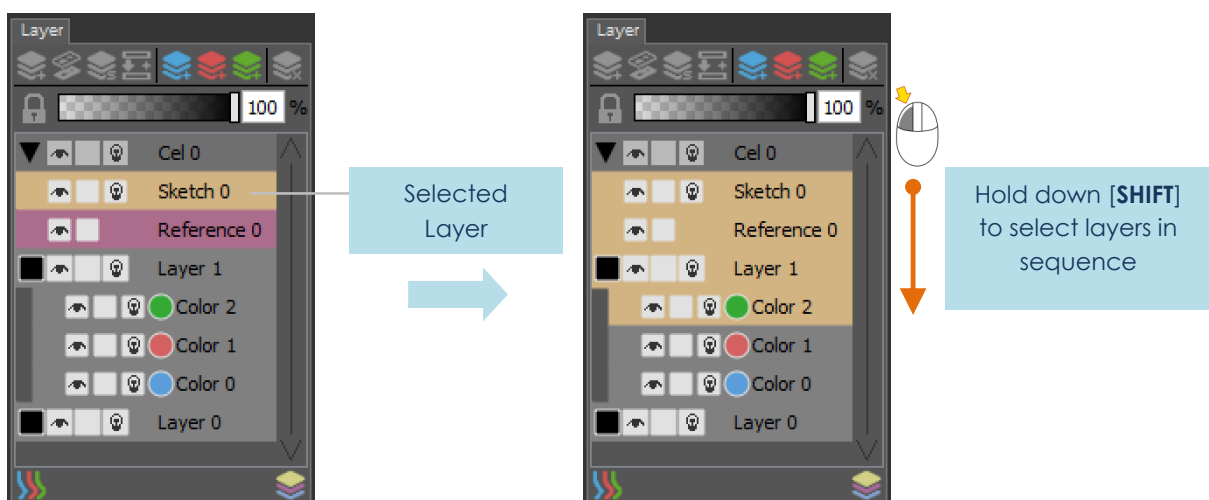
The order of the layers added are shown visually in the **Layers Panel**; strokes and filled regions in the topmost layer will hide strokes and filled regions in lower layers.

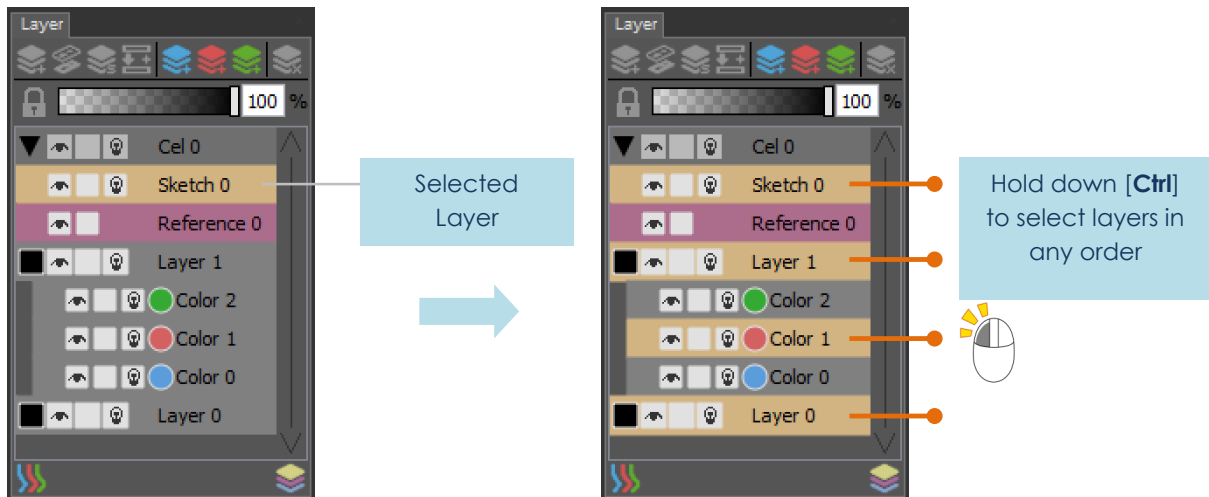


To remove a layer, press the Delete Layer button after selecting the desired layer.



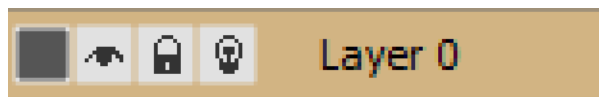
Hold down **[SHIFT]** to select a range of layers in sequence, or **[Ctrl]** to select multiple layers in any order.





You can also change the order of a layer by selecting the layer. First select the desired layer, then **Left Click and Drag** the layer to the desired position. It is also possible to select multiple layers in the same manner as mentioned above.

Each layer has 4 properties: Layer Tag, Layer Visibility, Layer Lock and Layer Lightbox.



Layer Tag

Allows you to assign the layer with a specific colour for easier identification and selection.



Layer Visibility

Controls whether the contents in that layer will be shown on the canvas.



Layer Lock

Determines whether the contents in that layer can be modified.



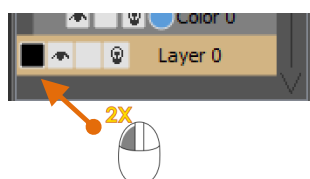
Layer Lightbox

Determines whether the contents in the layer will be displayed as onion-skinned images.

Left Click on the icons to enable or disable the respective properties.

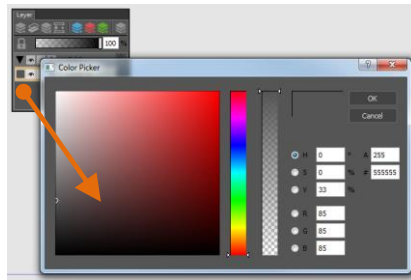
Change Drawing Layer Colour

The Drawing Layers colours can be altered by **Left Clicking Twice** on the **Drawing Layer Colour button** in the panel.



User Manual

A Colour picker dialog will appear to allow you to choose the colour. Click **OK** to confirm your selection or **Cancel** to preserve the previous colour.



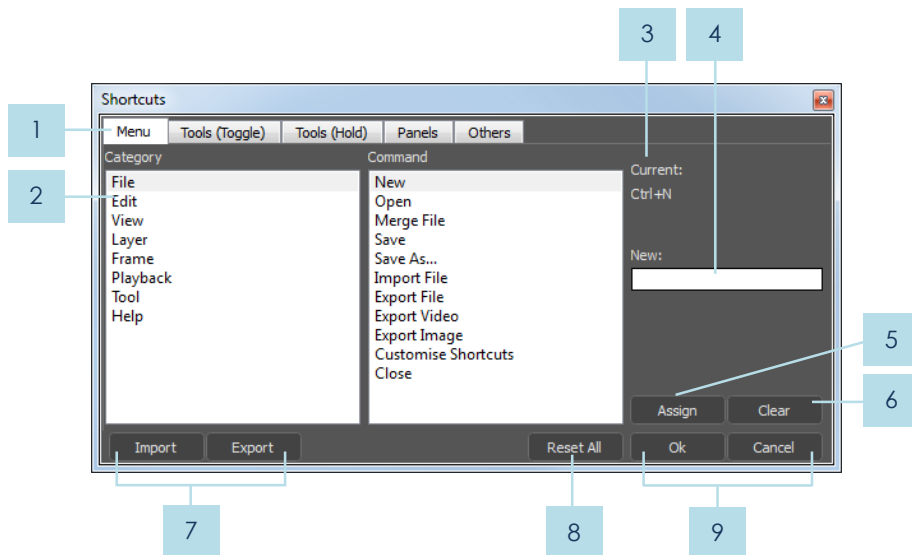
Colour Separation Layers

Used for strokes that define highlight and shadow regions on the canvas. These layers are added by left clicking on the Add Colour Separation Layer Buttons.

Customising Shortcuts

From the menu bar, select **File > Customise Shortcuts**.

A dialog box will appear showing the category and commands with shortcuts in CACANi.



1 Functions and Commands Tabs

Lists of all user assignable functions and commands in CACANi, organized in tabs.

2 Menu Functions / Commands Selection

Allows you to choose the menu function or command you want to assign a shortcut for.

3 Currently Assigned Shortcut

Shows you the shortcut that is currently assigned to the function or command.

4 New Shortcut Assignment

Allows you to enter a shortcut for the selected function or command.

5 Assign Shortcut Button

Once a shortcut is entered, you can click this button to confirm the shortcut assignment.

6 Clear Shortcut Button

Allows you to remove a currently assigned shortcut to the selected function or command.

7 Import and Export Shortcuts Buttons

Allows you to load or save user assigned shortcuts via CACANi shortcut (.csc) files.

8 Reset All Shortcuts Button

Allows you to remove all user assigned shortcuts and revert to the original state.

9

Confirmation Buttons

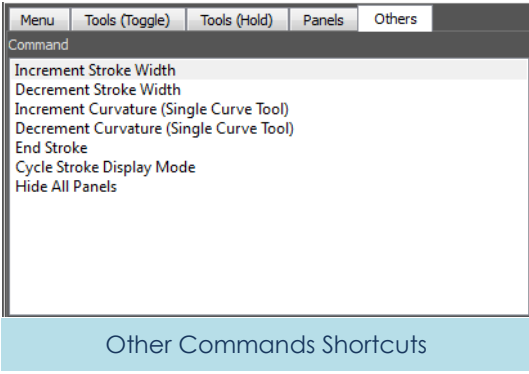
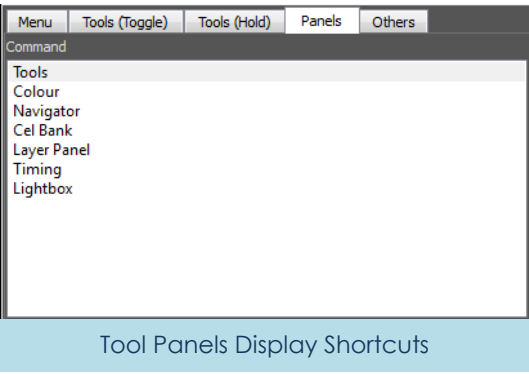
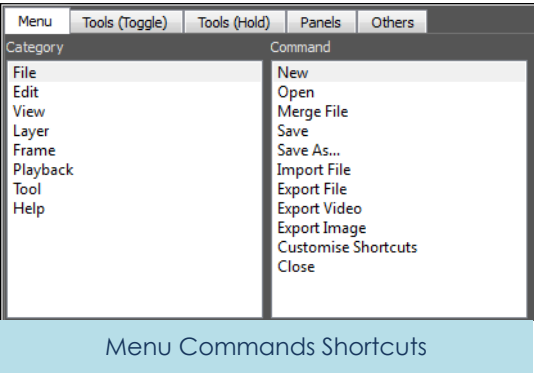
Allows you to confirm changes and exit the dialog box by clicking **Ok**, or remove changes by clicking **Cancel**.

Assigning Shortcuts

Toggle and Hold Shortcuts

Other than the typical keyboard shortcut assignments, CACANi also has a unique system of shortcuts that allows you to toggle tools instead of switching to them.

First, a list of the tabs in the shortcuts dialog:



In the **Tools (Toggle)** and **Tools (Hold)** tabs, the tools listed are similar. This is because for those commands, you can choose to either configure a *toggle* shortcut for it, or a *hold* shortcut.

For example, the keyboard shortcut [Q] is assigned to the **Selection tool**.

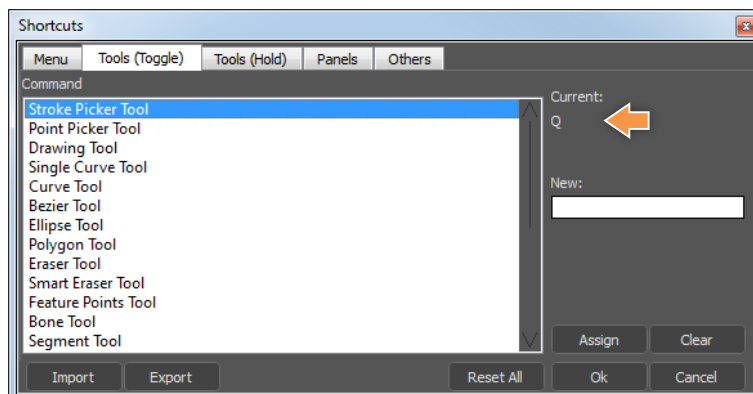
A **Toggle shortcut** is where, after you **press and release [Q]**, the active tool will change and remain as the Selection tool until you choose another tool to switch to.

A **Hold shortcut** is where the active tool changes and remains as the Selection tool **as long as [Q] is held down**. The moment you release [Q], the active tool reverts to your previous tool.

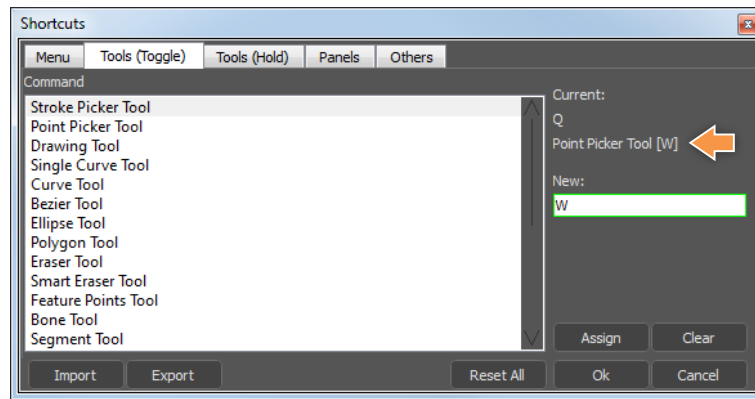
This is useful for artists who tend to use only a few tools, but need to switch to other tools occasionally.

Procedure for Assigning Shortcuts

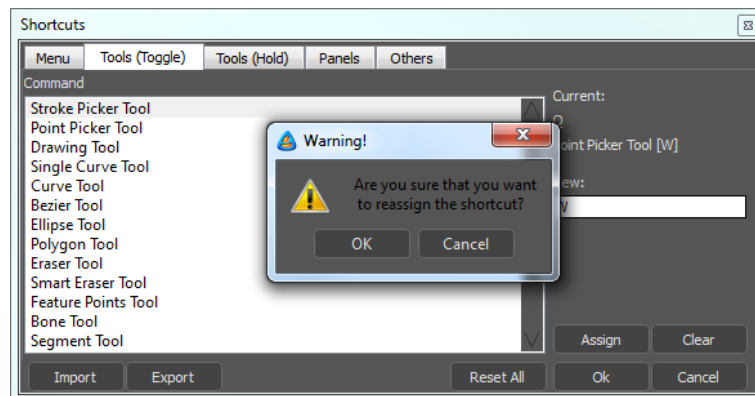
You can assign shortcuts easily by going into the **File** Menu, then choosing **Customise Shortcuts**. In this example, we are going to change the toggle shortcut for the Selection tool. Currently, [Q] is assigned to the tool.



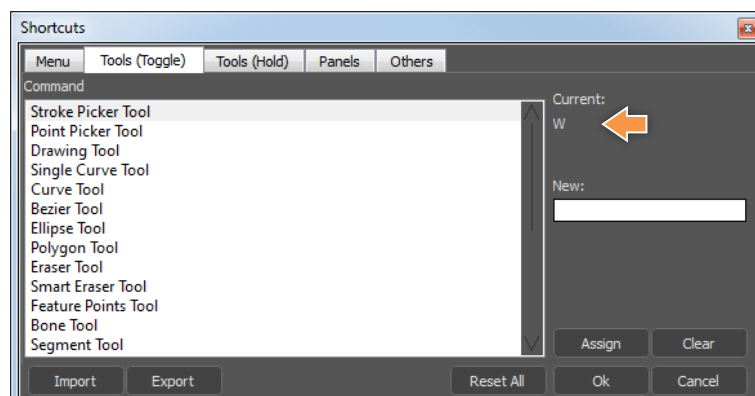
When the shortcut [W] is entered into the **New Shortcut** field, CACANi warns that the shortcut has already been assigned to another tool, the **Stroke Editor**.



Ignoring the first warning and clicking the **Assign Shortcut** button will bring up another warning.



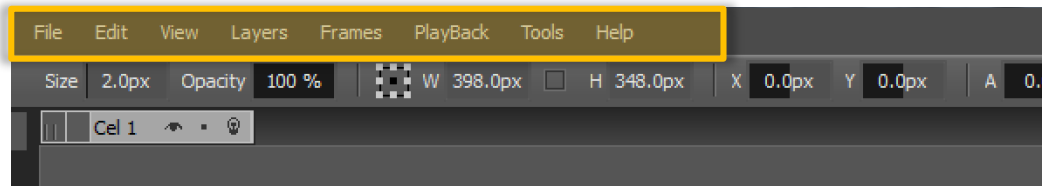
Finally, clicking the **OK** button will make CACANi change the shortcut to [W], and remove the original shortcut assignment. Note that the Stroke Editor does not have any shortcut assigned to it now.



03

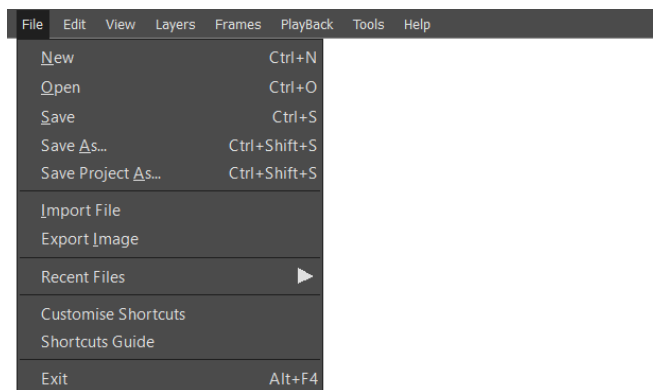
The Menu Bar

CACANi Menu Options



The Menu Bar holds various menus that allow you to control or change various features in CACANi.

File Menu



New

Creates a new file. If a file is currently being worked on, a dialog will prompt whether to save the current work.

Open

Opens a previously saved file.

Save

Saves the current work. If the current work was not saved before, a dialog will prompt on the name and the type of file to save to.

Save As

Saves the current work as a different file. A dialog will prompt for the name and the type of file to save to.

(See [Chapter 10 - Saving the Animation](#))

Import File

Opens a CACANi Essential Format (.cspe), CACANi XML (.cacx), or Scalable Vector Graphics (.svg) file to work on.

Export Image

Exports the current frame, all frames or selected frame as images. A dialog will prompt you for the format, name, resolution and other settings of the images.

(See [Chapter 10 – Exporting the Animation](#))

Recent Files List

Records the last 5 files that were in use for easier access.

Customise Shortcuts

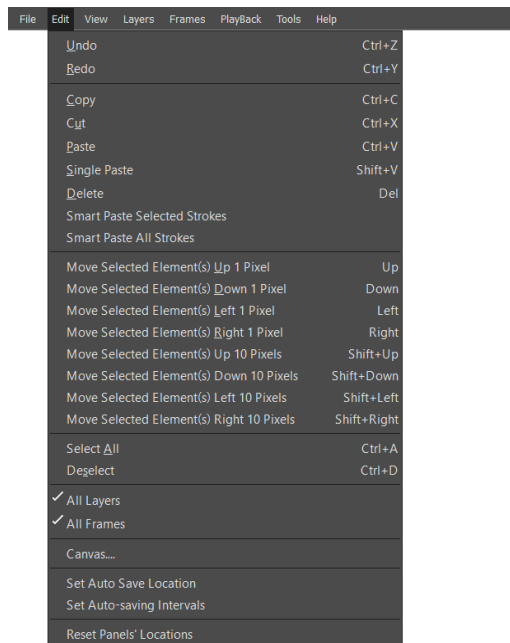
Brings up the **Shortcuts Customisation Panel**

(See [Chapter 02 - Customising Shortcuts](#))

Exit

Exits CACANi software. If the existing work has not been saved, an 'Unsaved Changes' dialog box will appear.

Edit Menu



Undo

Undoes the previous action. Name of the previous action will be shown.

Redo

Repeats the next action. Name of the next action will be shown.

Copy

Duplicates and stores the selected strokes in the clipboard.

Cut

Remove the selected strokes from the canvas and place them in the clipboard.

Paste

Transfers the stored strokes back onto the canvas in the active sheet.

Single Paste

Transfers the stored strokes back onto the canvas in the active sheet, disregarding any stroke indices.

Delete

Removes the selected strokes from the canvas.

Smart Paste Selected Strokes

Unmatched strokes selected in the Navigator (Reference Frame mode enabled) are pasted into the active frame.

Smart Paste All Strokes

All unmatched strokes in the reference key frame are pasted into the active frame.

Move Selected Element(s) Up/Down/Left/Right 1 Pixel

Translates the chosen strokes by a single pixel in the stated direction.

Move Selected Element(s) Up/Down/Left/Right 10 Pixels

Translates the chosen strokes by 10 pixels in the stated direction.

Select All

Makes a selection of all strokes on the canvas.

Deselect

Clears any current selection of strokes.

(Enable / Disable) All Layers

When enabled, stroke and frame operations will affect all layers.

(Enable / Disable) All Frames

When enabled, stroke and frame operations will affect all frames.

Canvas...

Opens a window that allows you to configure the resolution of the canvas, in pixels.

Set Auto Save Location

Allows you to change the folder where the auto-save files are stored in.

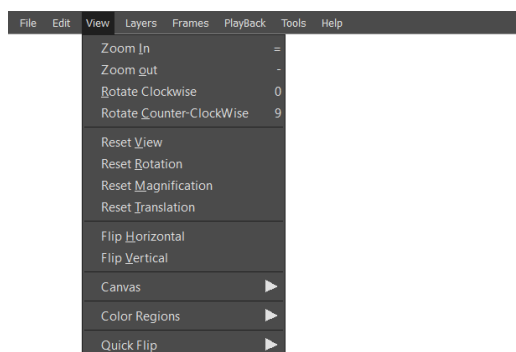
Set Auto-saving Intervals

Allows you to adjust the elapsed time before CACANi automatically makes a copy of your current file.

Reset Panel Locations

Reverts the various elements of CACANi to their default positions.

View Menu



Zoom in

Magnifies the view of the canvas.

Zoom out

De-magnifies the view of the canvas.

Rotate CW

Rotates the canvas clockwise.

Rotate CCW

Rotates the canvas Counter-Clockwise.

Reset Canvas

Removes any rotation, magnification and movement of the canvas.

Reset Rotation

Removes any rotation of the canvas.

Reset Scale

Removes any resizing of the canvas.

Reset Translation

Removes any movement of the canvas and moves it back to the center of the workspace.

Flip Horizontal

Flips the canvas along the Y axis.

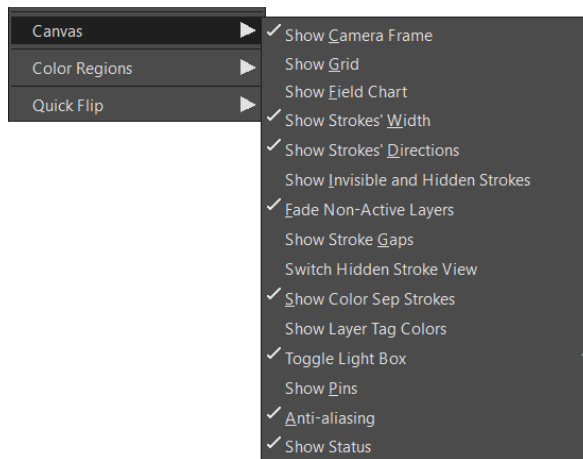
Flip Vertical

Flips the canvas along the X axis.

Auto Pan Reference Frame

When enabled, the Navigator Panel display (Reference Frame mode enabled), will be moved together when panning the display in CACANi's main canvas.

View > Canvas

**Show Camera Frame**

Displays the camera frame on the canvas.

Show Grid

Displays a grid over the entire canvas.

Show Field Chart

Displays an animator's field chart within the camera frame.

Show Strokes' Width

Disables thickness and pressure of strokes and displays them as vector lines only.

Show Strokes' Directions

Indicates the direction of a stroke with coloured arrows.

Show Invisible and Hidden Strokes

Displays invisible and hidden strokes on the canvas.

Fade Non-Active Layers

Distinguishes between strokes in active (selected) and non-active (unselected) layers.

Grey Out Matched Strokes (Navigator only)

(Only applicable to Navigator Panel, Reference Frame mode Enabled) Displays strokes that are already matched or corresponded will be as grey strokes, instead of the strokes' original colour.

Show Stroke Gaps

Indicates unconnected stroke ends.

Show Hidden Stroke View

Displays invisible strokes as black, and fades out visible strokes for easier drawing.

Show Colour Sep strokes

Displays colour separation strokes on the canvas.

Show Layer Tag Colours

Displays stroke colours based on their layer colour tags.

Toggle Lightbox

Displays strokes from other frames as an onionskin image.

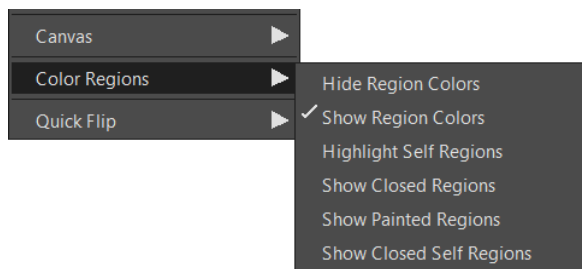
Show Pins

Indicates intersection points between strokes.

Apply Anti-Aliasing to Strokes

Enables stroke edge smoothening.

View > Colour Regions



Hide Region Colours

Disables the display of painted regions.

Show Region Colours

Displays painted regions with their respective colours.

Highlight Self Regions

Indicates all self regions in all layers with checkered colours.

Show Closed Regions

Indicates all regions that are ready for painting in multiple colours.

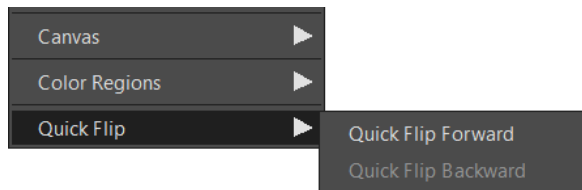
Show Painted Regions

Indicates all filled regions in black.

Show Closed Self Regions

Displays only self regions found on the active layer.

View > Quick Flip

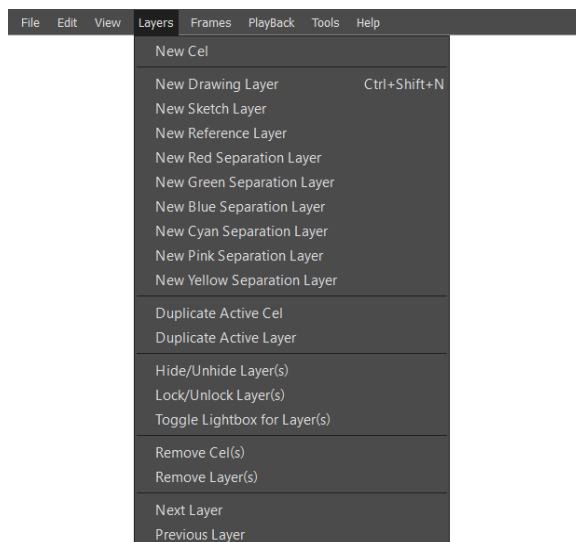
**Quick Flip Forward**

Allows you to preview the animation from the current key frame to the next key frame by generating in-between frames temporarily.

Quick Flip Backward

Allows you to preview the animation from the current key frame to the previous key frame by generating in-between frames temporarily.

Layer Menu

**New Cel**

Creates a cel above the selected cel in the Cel Bank.

New Drawing Layer

Creates a drawing layer above the selected layer in the Cel Bank.

New Sketch Layer

Creates a sketch layer above the selected layer in the Cel Bank.

New Reference Layer

Creates a reference layer above the selected Layer in the Cel Bank.

New Colour Separation Layer (Red, Blue, Green, Cyan, Pink, Yellow)

Creates a colour separation layer above the selected Layer in the Cel Bank. Strokes drawn within the layer will not be shown in the final exported images.

Duplicate Active Layer

Clones the selected layer's contents and place it in a new layer above the current selected one.

Hide/Unhide Layer(s)

Enable / Disable the visibility of selected Layers.

Lock/Unlock Layer(s)

Prevents the contents of selected Layers from being changed.

Toggle Lightbox for Layer(s)

Enable / Disable the onionskin images of selected Layers.

Remove Cel(s)

Delete the current selected Cel(s).

Remove Layer(s)

Delete the current selected Layer(s).

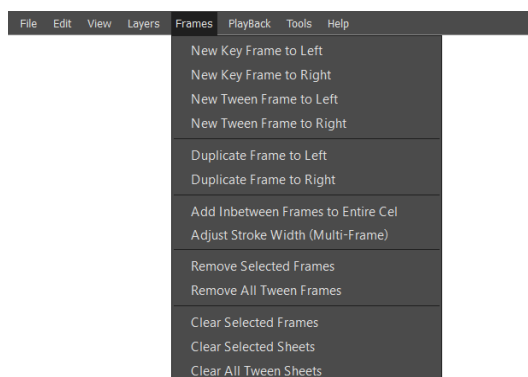
Next Layer

Selects the Layer beneath the current active Layer.

Previous Layer

Selects the Layer above the current active Layer.

Frame Menu



New Key Frame to Left/Right

A new key frame is inserted before/after the selected frame.

New Tween Frame to Left/Right

A new in-between frame is inserted before/after the selected frame.

Duplicate Frame to Left/Right

A clone of the selected frame is made and inserted before/after the original frame.

Add Inbetween Frames to Entire Cel

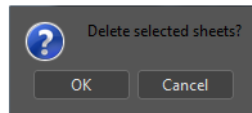
Allows you to create a fixed number of in-between frames for all keyframes in a cel.

Adjust Stroke Width (Multi-Frame)

Allows you to change the stroke width for all the frames in a layer.

Remove Selected Frames

Deletes selected frames from the Cel Bank. A Delete Confirmation Dialog box is shown.



Left click on button **[Yes]** to delete the selected frames. Left click on button **[No]** to return to the workspace without deleting any frames.

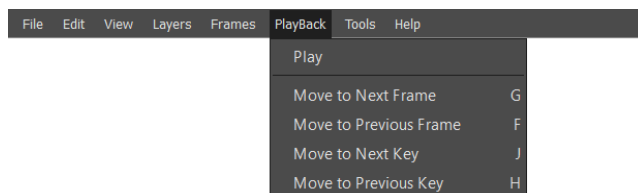
Remove All Tween Frames

Deletes selected In-between frames from the Cel Bank.

Clear Selected Frames / Selected Sheets / All Tween Sheets

Clear all strokes in the selected frames / sheets / all tween sheets.

Playback Menu

**Play**

Plays back the animation sequence.

Move to Next Frame

Selects the frame to the right as the active frame.

Move to Previous Frame

Selects the frame to the left as the active frame.

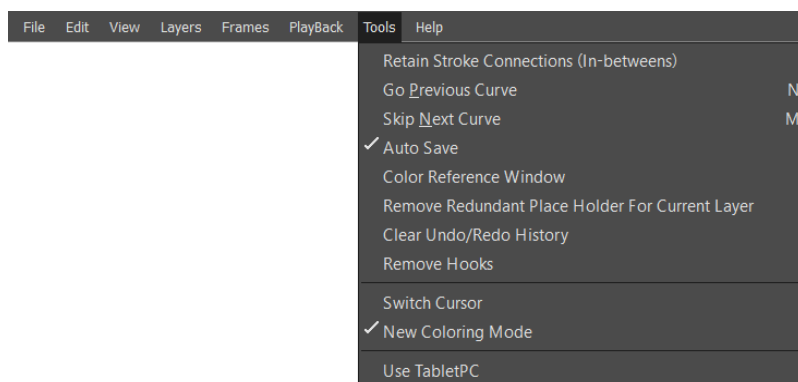
Move to Next Key

Selects the nearest key frame to the right as the active frame.

Move to Previous Key

Selects the nearest key frame to the left as the active frame.

Tools Menu



Retain Stroke Connections (In-betweenes)

Analyses all frames for any T intersection gaps and auto close them.

Go Previous Curve

Allows you to revert to a previously unmatched stroke.

Skip Next Curve

Allows you to skip the next unmatched stroke.

Auto Save

When enabled, CACANi will automatically make a backup of the currently opened file at specific intervals. The duration can be configured via the **Set Auto-saving Intervals** option in the **Edit** menu. The backup folder can be configured via the **Set Auto Save Location** option in the **Edit** menu. It is enabled by default.

Colour Reference Window

Opens up a window that allows you to load an image for colour reference.

Remove Redundant Place Holder for Current Layer

Analyses the frames in the active layer and reduces the number of blank stroke placeholders.

Clear Undo/Redo History

Deletes the undo/redo information, as a way to reduce memory consumption.

Remove Hooks (Experimental)

Analyses the stroke ends in a current drawing and truncates unwanted small hooks.

Switch Cursor

When enabled, cursor is rendered in software and cursor icons will not be displayed. When disabled, cursor is rendered using OpenGL. If you find that the cursor is lagging, enabling this may help. It is disabled by default.

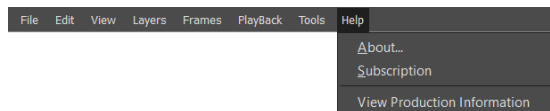
New Colouring Mode

When enabled, limits the Self Layer Paint Tool to only apply colour in self layer or single layer regions (regions formed from strokes in one layer). When disabled, the Self Layer Paint Tool will still apply colour to cross layer regions (regions formed from strokes in multiple layers). It is enabled by default.

Use TabletPC (Experimental)

Allows CACANi to obtain pressure information from devices that uses Microsoft Ink. It is disabled by default.

Help Menu

**About**

Shows information about the CACANi software.

Subscription

Allows you to manage your subscription. You can view subscription information, extend subscription with a new product key or deactivate the subscription to transfer to another computer.

View Production Information

Shows information about the currently opened CACANi file. Information can be exported as a text file.

04

Drawing Key Frames

The Tools Panel



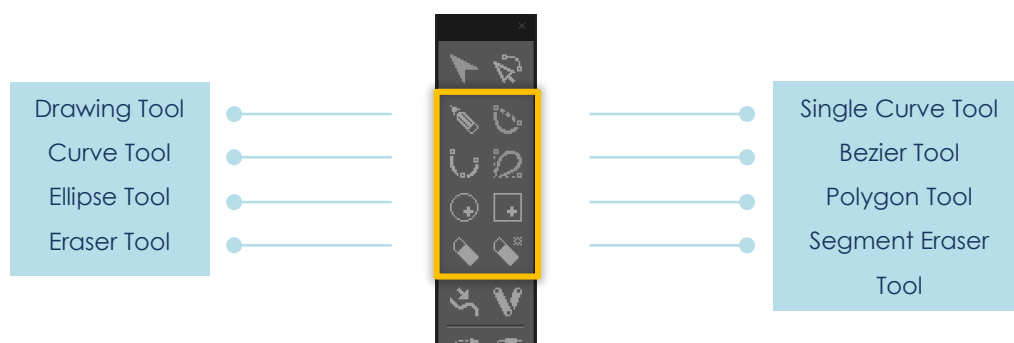
Making animation drawings is the focus of CACANi. Because of that, we have designed tools that will help make the process of animation faster. These are organized in the Tools Panel for ease of use and customizability.

Common Tool Properties

There are a number of tools which share similar property controls. For example, the Drawing Tool shares many similar properties with the Curve and Bezier Tools. As such, we'll have a more thorough explanation when the property is first listed, while subsequent similar properties will only make references to these descriptions.

Drawing Tools

Of all the tools, the Drawing Tools are probably the most frequently accessed. These are used for the creating of your drawings in CACANi.



Cling Shortcut Keys

Clinging is a method that forces strokes to snap to each other, while drawing or editing strokes.

When using the **Drawing**, **Single Curve**, **Curve** and **Bezier Tools** to draw, or the **Stroke Editor** to edit strokes, you can Hold Down CTRL to toggle both Cling to Stroke End and Cling to Stroke.

Alternatively, you can Hold Down SHIFT to toggle Cling to Stroke End only.

Both shortcut keys, when held down, **SWITCH** the mode of the Cling functions. For example, when Cling to Stroke End is Disabled in the Drawing Controls Bar, holding down SHIFT will Enable the function.

In addition, note that the Invisible Gaps and Auto Cling features (Drawing Tool) will only work when **Cling to Stroke** and/or **Cling to Stroke End** modes are enabled.

Please see [Chapter 04 – Cling to Stroke End](#) for more information on its uses.

Handling Sharp Angles in Strokes

When a drawing is going to be automatically in-betweened, care must be taken in areas of the drawing where the strokes have sharp angles. It is recommended to use a separate stroke for each side of the angle. This will allow a better in-between result.

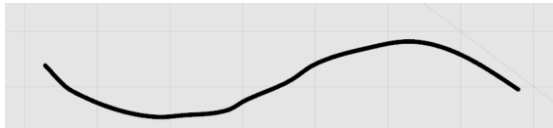
See [Chapter 08 – In-betweening Sharp Angles](#).



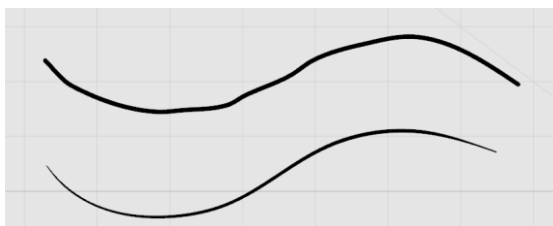
Drawing Tool

Allows you to draw strokes freely on the canvas. With a pressure sensitive stylus, you will also be able to create strokes of variable width.

Drawing can be done either using a tablet or the mouse. To draw using the mouse, press down the left mouse button and drag to form a path. A stroke will be created from the path and the stroke will have a constant stroke width.



To draw using the tablet, press the stylus down on the tablet to begin. As with the mouse, drag the stylus in this manner to form a path and lift the stylus to end the stroke. Using the pressure-based information from the stylus, the curve width will vary accordingly for the stroke.

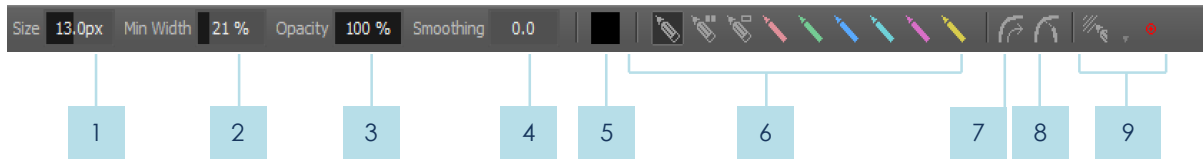


Drawn with mouse

Drawn with stylus

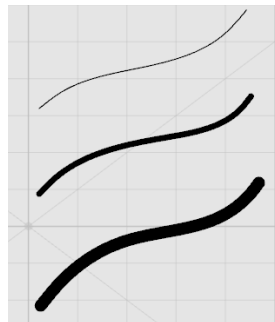
After the stroke is created, it will be smoothed according to the **Smoothing** Property in the Property Window. This applies to both strokes drawn using the mouse and the stylus.

Drawing Tool Properties



1 Size

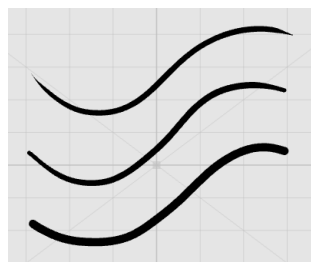
You can set the maximum width of a stroke by dragging the slider, or left clicking and typing a specific value.



Strokes at different widths

2 Min. Width

You can set a stroke's minimum width by dragging the slider, or left clicking and typing a specific value.

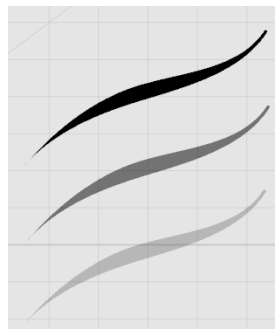


Strokes at different minimum widths

3 Opacity

You can set the opacity / transparency of the stroke by dragging the slider, or left clicking and typing a specific value.

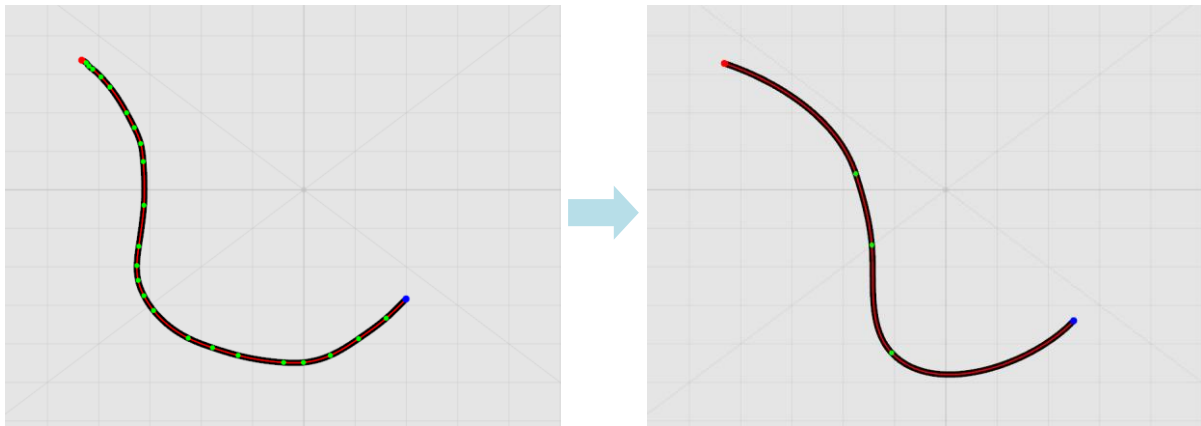
Opacity of the curve to be drawn is set by dragging the slider or left clicking and typing a specific value. The higher the value, the less transparent the curve will appear.



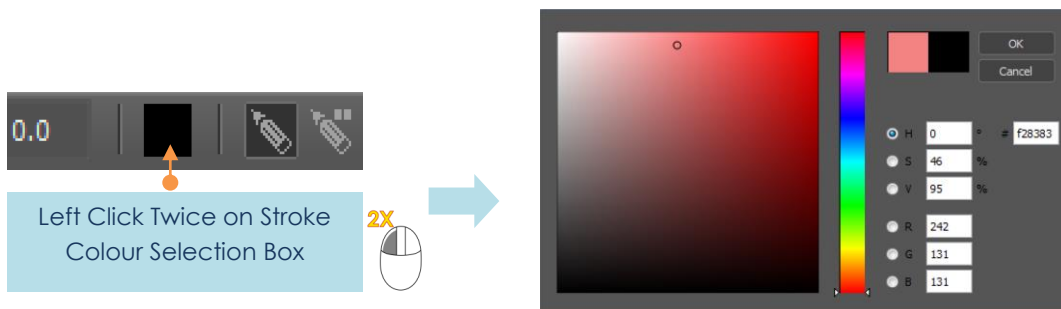
Strokes at different opacity values

4 Smoothing

You can change the smoothness of the stroke by dragging the slider, or left clicking and typing a specific value. The larger the value, the smoother the stroke and the lesser points there are.

**5 Stroke Colour Selection Box**

You can set the stroke colour by [**Left Clicking**] twice to bring up the **Colour Selection Box** dialog box. When done, just [**Left Click**] **OK** to confirm.

**6 Stroke Rendering Modes**

Allows you to draw a stroke with Normal, Invisible or Hidden property. Please refer to [Chapter 04 – Stroke Rendering Modes](#).

7 Auto Direction (*experimental feature)

When enabled, CACANi will try to anticipate the stroke direction when matching strokes. However, when the matching stroke in the new frame has a difference of more than 180 degrees compared to the stroke in the previous frame, it will result in an ambiguous stroke direction error message.

8 Invisible Gaps

With this enabled, when you finish drawing a stroke and the stroke end is near another stroke (based on the Cling threshold value), the stroke will be extended with an invisible segment to form a connection with the nearby stroke.

10 Drawing Modes

Drawing Modes act like rulers, allowing you to draw straight strokes based on the selected mode.

Normal Drawing Mode

Drawing Modes are disabled.

Grid Drawing Mode

Strokes are confined to vertical or horizontal straight lines.

Parallel Drawing Mode

Strokes are confined to straight lines at the specified angle.

Radial Drawing Mode

Strokes are confined to straight lines radiating from the Pivot Point.

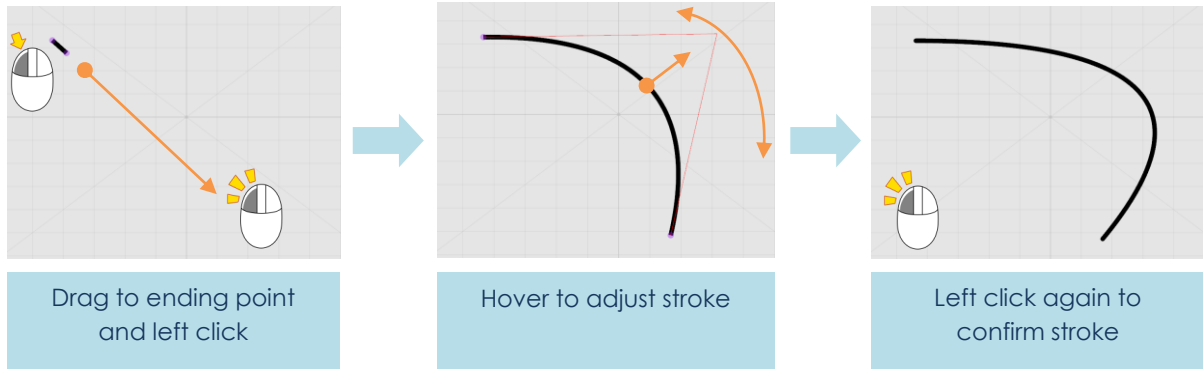
Pivot Point

With this enabled, you can select the Pivot Point on the canvas and move it to either adjust the angle of the straight lines in Parallel Drawing Mode, or to re-locate the convergent point of the strokes in Radial Drawing Mode.

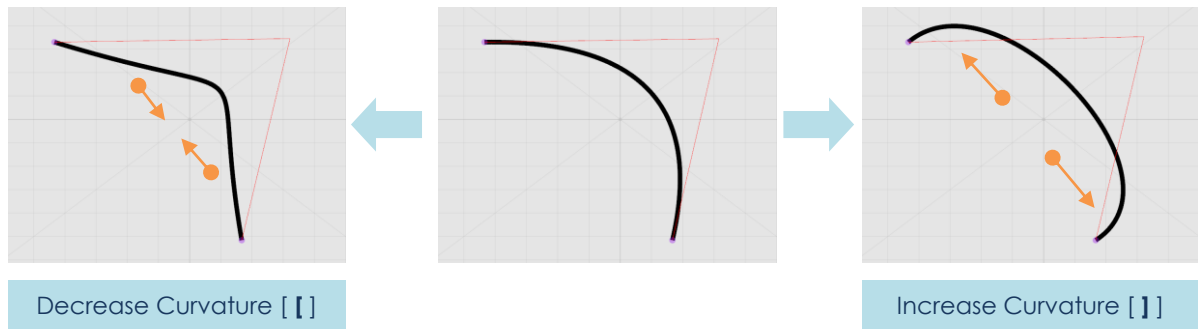


Single Curve Tool

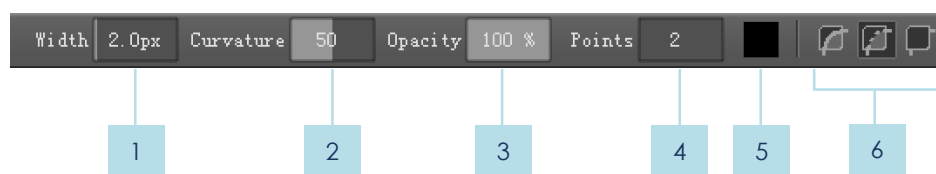
Allows you to draw a stroke, by first dragging from the starting to the ending point, then adjusting the curvature with the cursor and keyboard shortcuts.



While drawing, the curvature can be changed with shortcuts [] and [] after setting the ending point.



Single Curve Tool Properties

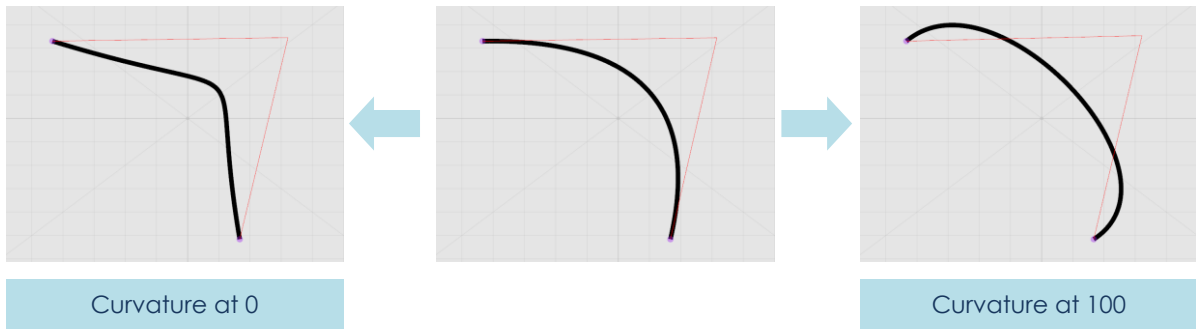


1 Width

Sets the maximum width of a stroke.

2 Curvature

You can set the curvature of the stroke by dragging the slider, or left clicking and typing a specific value.

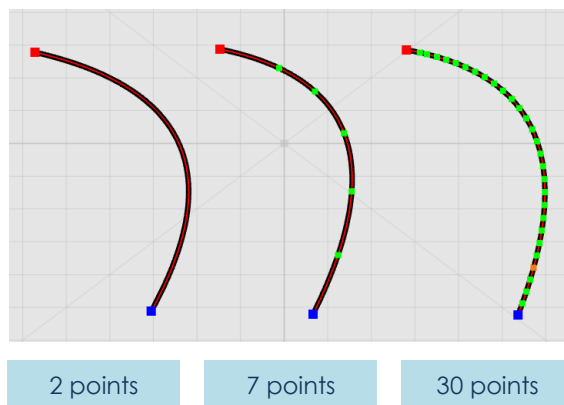


3 Opacity

Sets the opacity / transparency of a stroke.

4 Points

Sets the number of data points on the stroke. With more data points, refined adjustments to the stroke can be made, but it can also be too time-consuming.



5 Stroke Colour Selection Box

Sets the colour of the strokes being drawn.

6 Stroke Rendering Modes

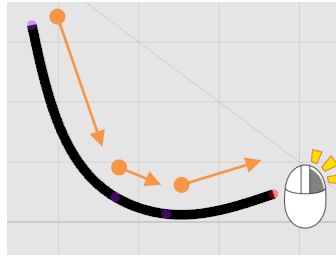
Allows you to draw a stroke with Normal, Invisible or Hidden property.

Please refer to [Chapter 04 – Stroke Rendering Modes](#).

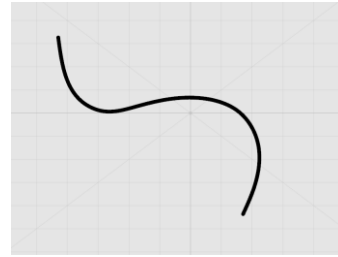


Curve Tool

Allows you to draw a smooth stroke by creating a sequence of points. Left Click on the canvas to create points for the stroke, and Right Click to end the stroke.



Create a series of points



Stroke drawn based on points

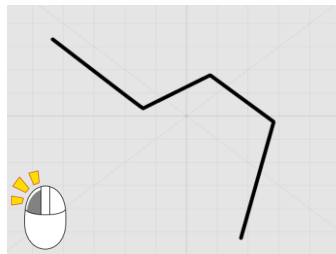
Curve Tool Properties

Please refer to [Chapter 05 - Single Curve Tool Properties](#).

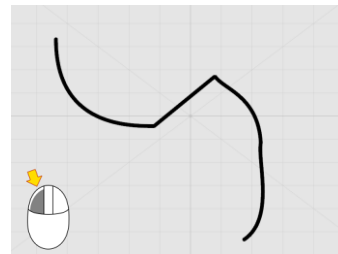


Bezier Tool

Allows you to draw a discontinuous stroke by creating a sequence of points. Straight, discontinuous segments are created when Left Clicking only, while holding down Left Mouse Button and Dragging will create curved stroke segments.



Left clicking only



Hold Left Mouse Button and Drag

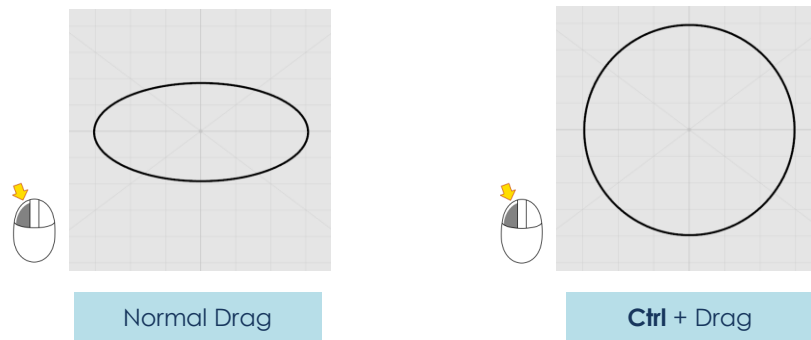
Bezier Tool Properties

Please refer to [Chapter 05 - Single Curve Tool Properties](#).

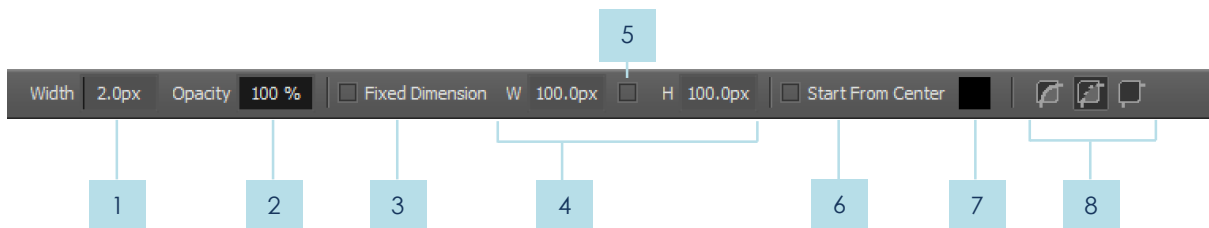


Ellipse Tool

Allows you to draw an ellipse or circle. Dragging the cursor will create an oval shape. To create a circle, hold down **[Ctrl]** while dragging.



Ellipse Tool Properties



1 Width

Sets the maximum width of a stroke.

2 Opacity

Sets the opacity / transparency of a stroke.

3 Fixed Dimension

When enabled, all newly created polygons will be the same pixel width and height as stated in the **W** and **H** input fields.

4 W and H (Resizing)

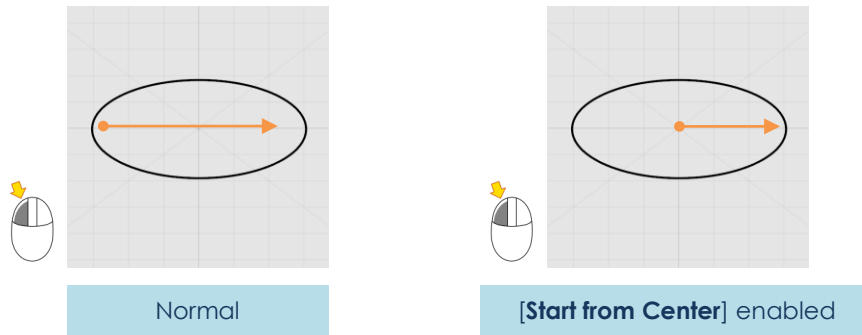
Width and Height of the ellipse, in pixels. Both values can be changed by dragging the slider, or left clicking and typing a specific value.

5 Maintain Aspect Ratio

When enabled, changing either the width or height of the ellipse will lead to a corresponding change in the other.

6 Start From Center

When enabled, the creation of an ellipse will always start from the center.

**7 Stroke Colour Selection Box**

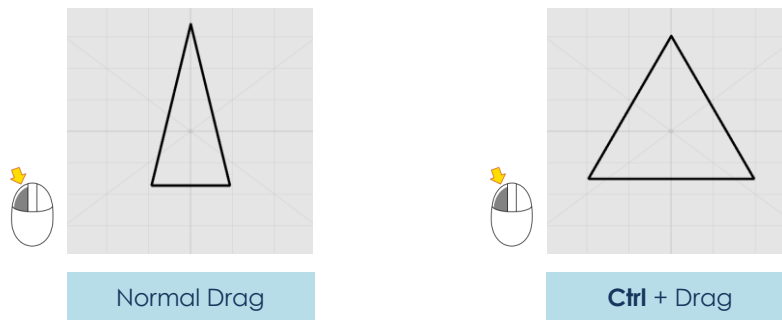
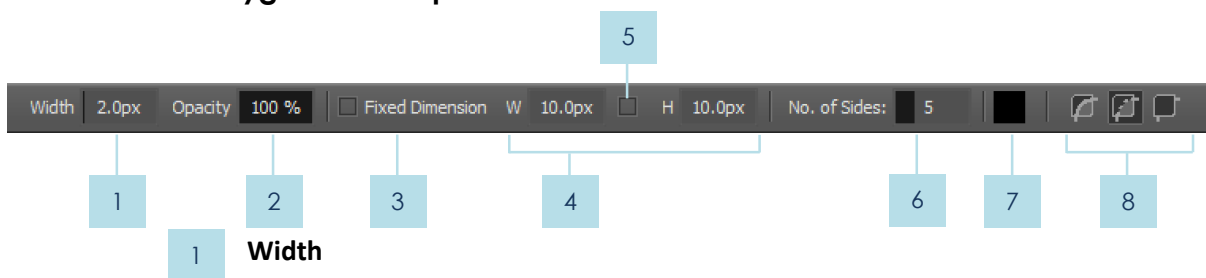
Sets the colour of the strokes being drawn.

8 Stroke Rendering Modes

Allows you to draw an ellipse with Normal, Invisible or Hidden Strokes. Please refer to [Chapter 05 – Stroke Rendering Modes](#).

**Polygon Tool**

Allows you to draw a polygon. Dragging the cursor will create a polygon. To create regular polygons, hold down **[Ctrl]** while dragging.

**Polygon Tool Properties****Width**

Sets the maximum width of a stroke.

User Manual

2 Opacity

Sets the opacity / transparency of a stroke.

3 Fixed Dimension

When enabled, all newly created polygons will be the same pixel width and height as stated in the **W** and **H** input fields.

4 W and H (Resizing)

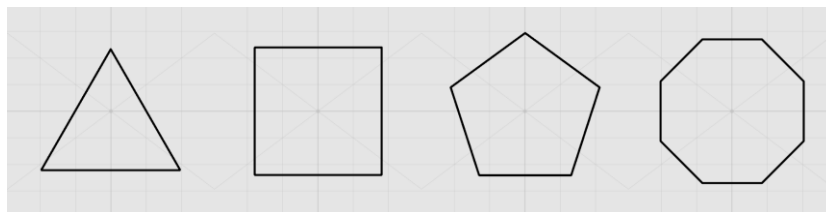
Width and Height of the polygon, in pixels. Both values can be changed by dragging the slider, or left clicking and typing a specific value.

5 Maintain Aspect Ratio

When enabled, changing either the width or height of the polygon will lead to a corresponding change in the other dimension.

6 No. of Sides

You can create polygons with different number of sides by changing the value in the spin box.



7 Stroke Colour Selection

Sets the colour of the strokes being drawn.

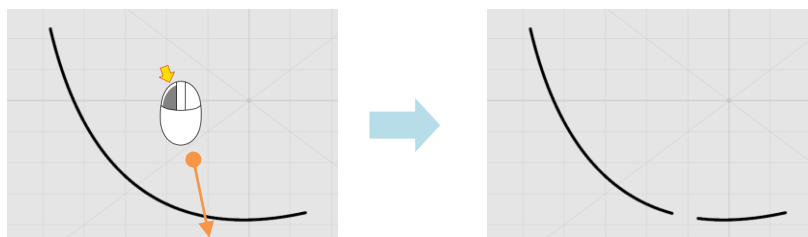
8 Stroke Rendering Modes

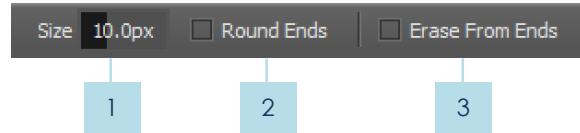
Allows you to draw a polygon with Normal, Invisible or Hidden Strokes. Please refer to [Chapter 05 – Stroke Rendering Modes](#).



Eraser Tool

Allows you to erase strokes by dragging over them.

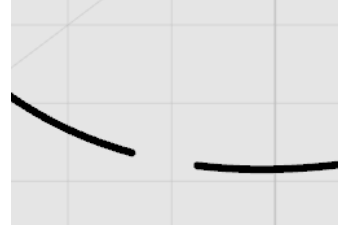
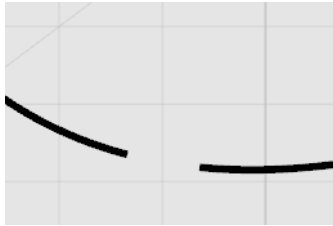


Eraser Tool Properties**1 Size**

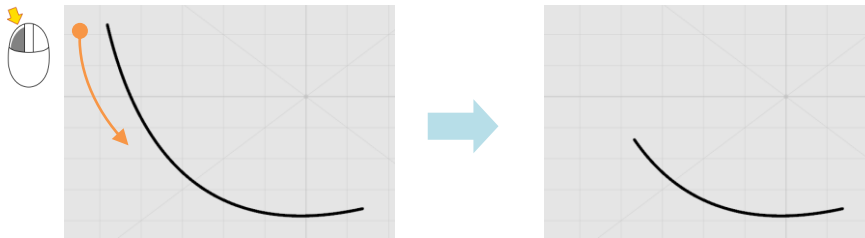
By changing the width of the Eraser Tool, the erasing area will be larger.

2 Round Ends

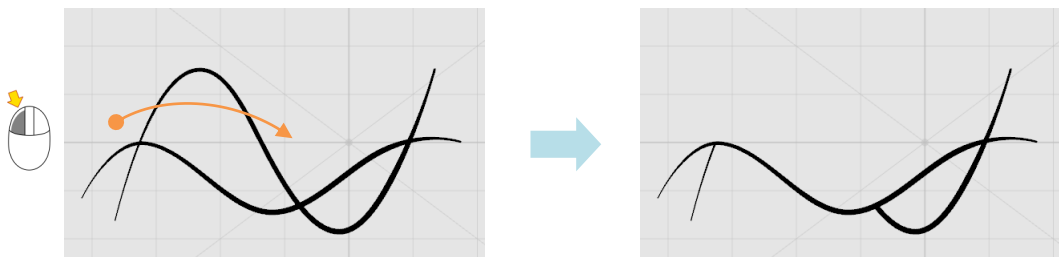
When enabled, the ends of the erased stroke segments will be rounded.

**3 Erase From Ends**

When enabled, strokes can only be erased from their ends.

**Segment Eraser Tool**

Allows you to erase stroke segments between intersection points.

**Stroke Eraser Tool**

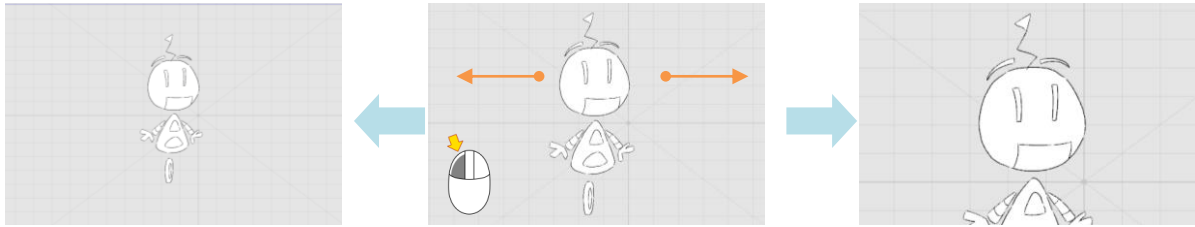
Allows you to erase the entire stroke.

Canvas Navigating Tools



Canvas Magnifier Tool [Ctrl + Spacebar + Drag] or [1] and [2]

Allows you to zoom into the canvas by **dragging Right**, and zoom out by **dragging Left**.



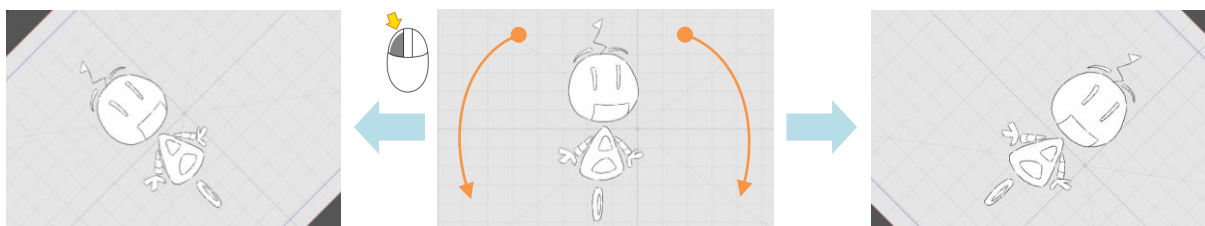
Canvas Pan Tool [Spacebar + Drag]

Allows you to move the canvas by dragging.



Canvas Rotate Tool [SHIFT + Spacebar] or [3] and [4]

Allows you to rotate the canvas by dragging in a clockwise, or anti-clockwise motion.

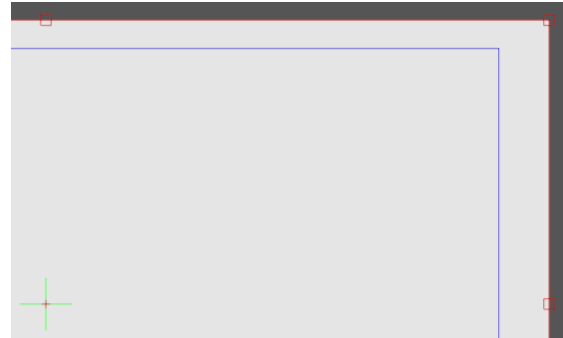
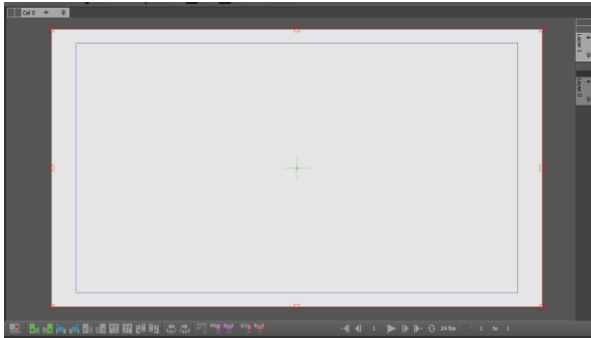


Configuration Tools



Camera Tool

Allows you to adjust various camera settings in the property bar. When the tool is selected, the camera frame is outlined in red on the canvas, with adjustment handles.



Resizing, Rotating, Moving the Camera on the Canvas

To **Resize** the camera, left click and drag on any of the 8 handles.

If the **Maintain Aspect Ratio** option is enabled (in Property bar), dragging on any of the **4 corner handles** will resize the camera frame proportionally.

Alternatively you can also hold down **SHIFT** while dragging the corner handles

To **Rotate** the camera, left click and drag anywhere along the edge of the camera frame.

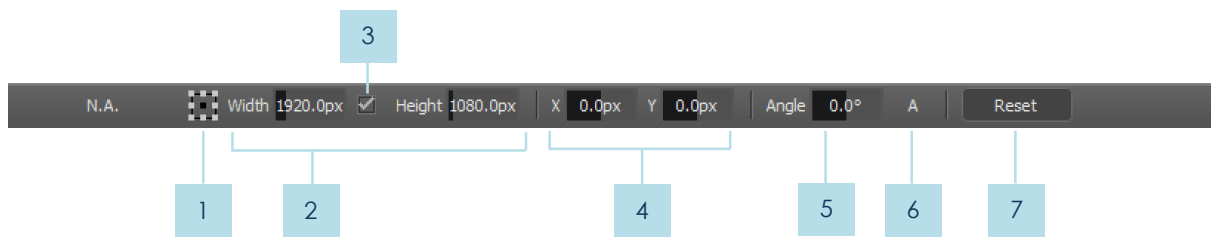
To **Move** the camera, left click anywhere within the camera frame and drag.

Note that the steps described above are applicable for the [reference image](#) and [offpeg image](#) adjustments as well.

The centre of the camera is indicated by a **red** cross.

The centre of the canvas is indicated by a **green** cross.

Camera Tool Properties



1 Resizing Anchor

Sets the anchor for the scaling of selected elements.

2 Width and Height

Resolution of the camera frame, in pixels. Both values can be changed by dragging the slider, or left clicking and typing a specific value.

3 Maintain Aspect Ratio

When enabled, changing either the width or height of the camera will lead to a corresponding change in the other dimension.

4 X and Y (Translation)

Horizontal and Vertical positions of the centre of the camera frame. A positive **X** value moves the camera frame right, whereas a positive **Y** value moves the camera frame up.

5 Angle (Rotation)

Rotation angle of the camera frame. A positive value rotates the camera frame in the clockwise direction, whereas a negative value rotates the camera frame in the anti-clockwise direction.

6 Apply to All Frames

When enabled, changes to the camera properties will affect all frames in the layer.

Reset

7 The translation, scaling and rotation values of the camera frame are reverted to their original values.



Offpeg Tool

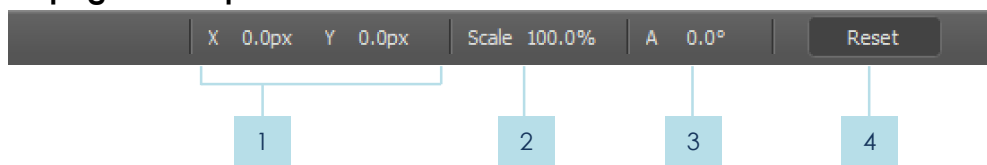
Allows you to adjust offpeg image settings in the property bar. When the tool and a offpeg image are **both** selected (in property bar or Lightbox), the offpeg image is outlined in turquoise on the canvas, with adjustment handles.



Resizing, Rotating, Moving the Offpeg Image on the Canvas

Refer to Camera Tool > Resizing, Rotating, Move the Camera on the Canvas.

Offpeg Tool Properties



1 X and Y (Translation)

Horizontal and Vertical positions of the centre of the offpeg image, in pixels. A positive **X** value moves the image right, whereas a positive **Y** value moves the image frame up.

2 W and H (Resizing)

Width and Height of the offpeg image, in pixels. Both values can be changed by dragging the slider, or left clicking and typing a specific value.

3 Angle (Rotation)

Rotation angle of the offpeg image. A positive value rotates the image in the clockwise direction, whereas a negative value rotates the image in the anti-clockwise direction.

4 Reset

The translation, scaling and rotation values of the offpeg image are reverted to their original values.

Stroke Rendering Modes

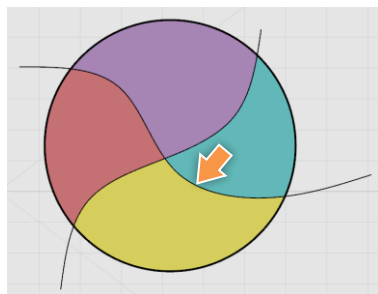
To make hand drawn animation convincing, 3 dimensional movements like turning and rotation are frequently employed. As a result, the features of an object or character are always changing, appearing and disappearing in animation sequences.

To help with this aspect of animation production, we have introduced the concept of **Stroke Rendering Modes** and **Colour Separation Modes** in CACANi. Strokes or segments of strokes can be rendered invisible or hidden so that they do not show up on the exported images.



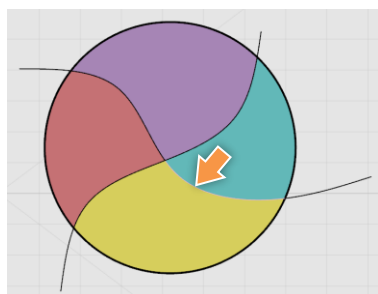
Normal Stroke Rendering Mode

Strokes drawn are displayed on the canvas and can be exported. They can form closed regions.



Invisible Stroke Rendering Mode

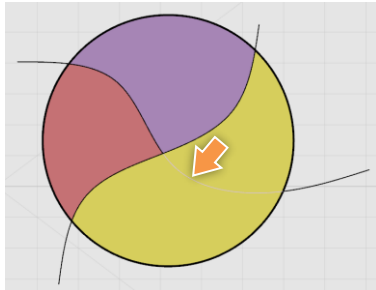
Strokes drawn are displayed as pink paths on the canvas and cannot be exported. Invisible strokes or stroke segments cannot be seen, but they can still form closed regions.





Hidden Stroke Rendering Mode

Strokes drawn are displayed as purple paths on the canvas and will not be exported. Hidden strokes or stroke segments cannot be seen and cannot form closed regions.



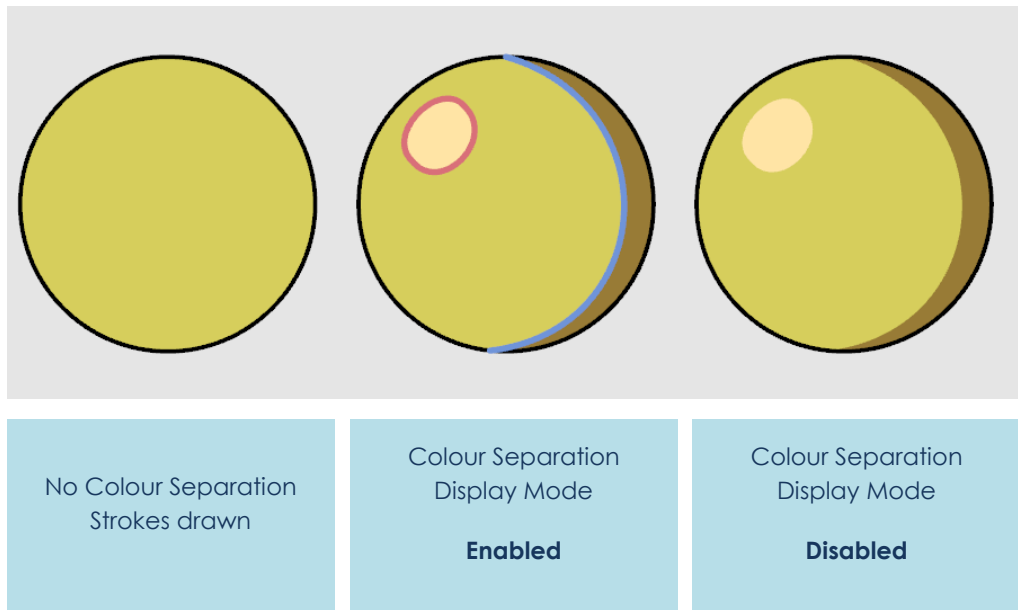
Colour Separation Modes

In addition to the 3 stroke rendering modes mentioned above, we have another 6 colour separation modes to allow you to draw colour separation strokes.



Understanding Colour Separation Strokes

These are strokes that you can use to draw regions like highlights or shaded regions of an object or character. These strokes can be turned off (via the Colour Separation Display Mode) and will not appear in the final export of the drawings.



Colour Separation Modes VS Colour Separation Layers

The main difference lies in that when using **Colour Separation Modes**, the strokes are within the same layer as the normal visible strokes. In addition, the Bone Tool can be used to group them together with the normal strokes.

The **Colour Separation Layers** are discrete layers, so ALL strokes within are colour separation strokes. However, that means that these strokes cannot be grouped with strokes in other layers.

Drawing Controls

The Drawing Controls holds the drawing mode options and the Undo and Redo tools. The drawing mode options, when enabled, affect the drawing and selection of strokes in different ways, so it is best for the artist to learn and be familiar with their usages in different scenarios.



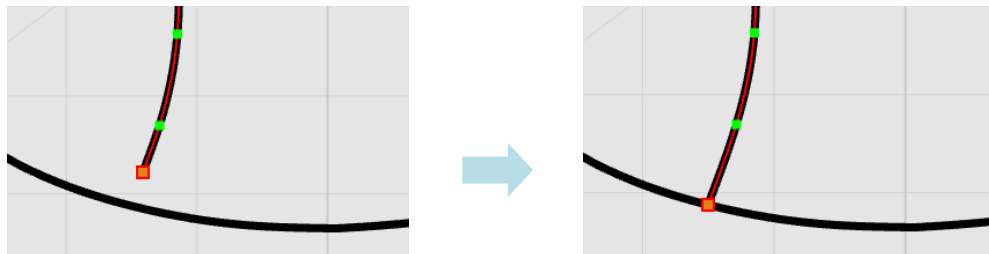
Cling to Stroke End Mode

When enabled, the cursor will snap to the nearest stroke end.

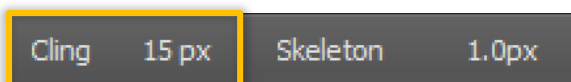


Cling to Stroke Mode

When enabled, the cursor will snap to the nearest stroke.



Cling Range



You can adjust the range (based on screen pixels) at which the clinging will come into effect. Note that at higher zoom levels, the perceived range will be smaller.

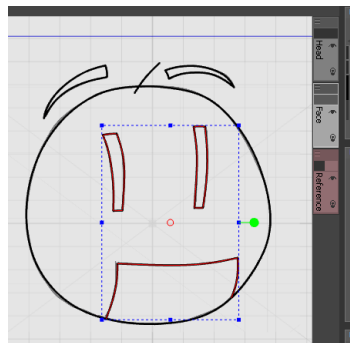
Clinging is an important method to ensure the strokes form closed regions for painting later.

Please see [Chapter 05 – Cling Shortcut Keys](#) for more information on its uses.

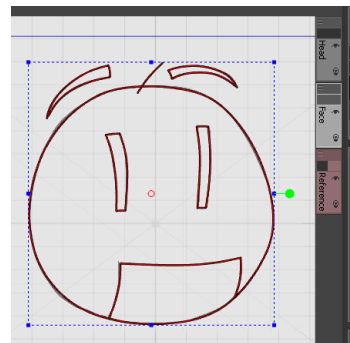


Cross-Layer Stroke Selection Mode

When enabled, you can select strokes in different layers.



Disabled: Only strokes in active layer are selected



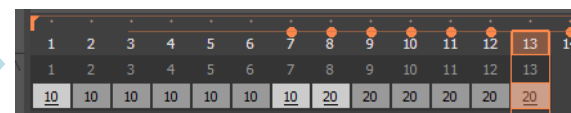
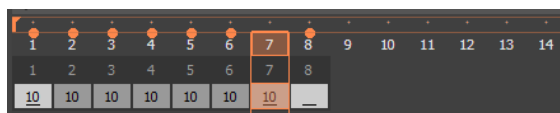
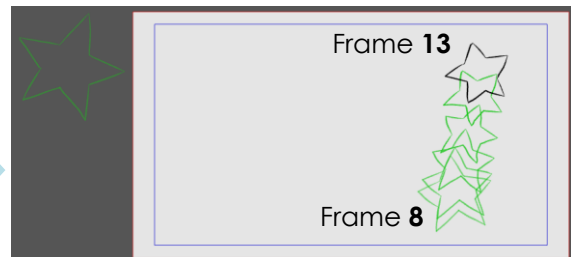
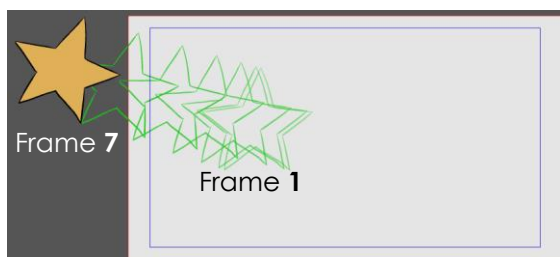
Enabled: Strokes in all layers (within cell) are selected



New Stroke Index Mode

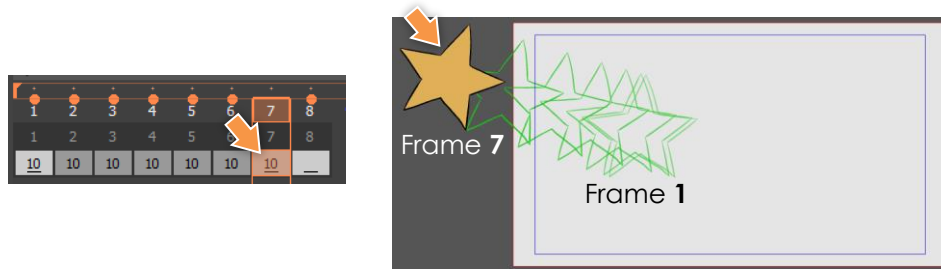
When enabled, any unmatched strokes will be disregarded, and strokes drawn will be assigned new stroke index numbers. This is needed when **drawing new elements that are not in the previous key frame**, and **unmatched strokes exist in the current frame**.

In the example below, one star moves out of the canvas at Frame 7, and a second star appears from Frame 8 to Frame 13. Without enabling the **New Stroke Index Mode**, CACANi will keep prompting you to draw the first star in Frames 8 – 13.

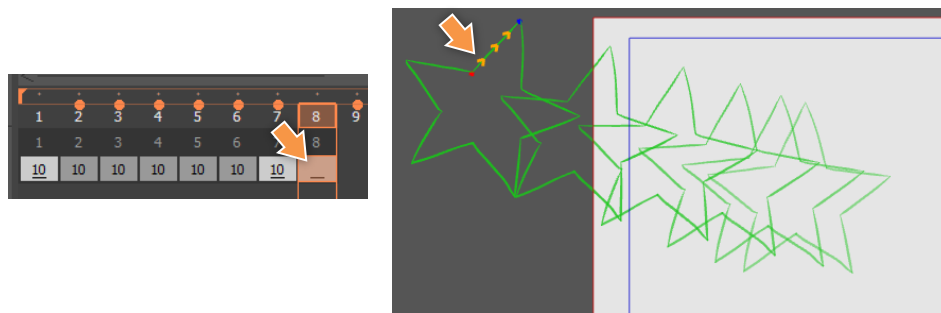


Drawing Key Frames | CACANi

To draw the above example, 10 strokes are drawn for the first star in the first 2 key frames, and then 5 in-between frames are generated.



Moving to the empty third key frame (Frame 8), CACANi will prompt you to draw the matching strokes.



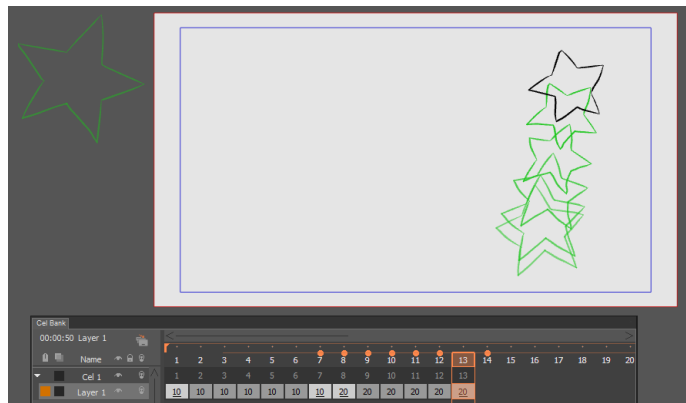
However, from Frame 8 onwards, since the star has disappeared from the canvas, we do not need to draw the star anymore.

Hence, to skip the drawing of the first star, enable **New Stroke Index Mode**. This will instruct CACANi to **disregard the matching strokes in the previous frame**, and allow you to draw new strokes, which in this case, is the second, smaller star.



User Manual

Now, from Frame 9 onwards, you will not be prompted to match those strokes anymore.



However, if you need to draw the first star again in subsequent frames, that can be done by changing the Reference Frame to display Frame 1's Onionskin Image.

Please refer to [Chapter 08 – Lightbox Panel: Reference Frame](#).



Auto Stroke Grouping Mode

When enabled, every stroke drawn will be grouped individually.



Undo Previous Action

When enabled, the previous action will be undone. You can undo up to a maximum of 30 actions.



Redo Next Action

When enabled, the next action will be redone. You can redo up to a maximum of 30 actions.

05

Selecting & Editing Strokes

Refining your Drawings in CACANi

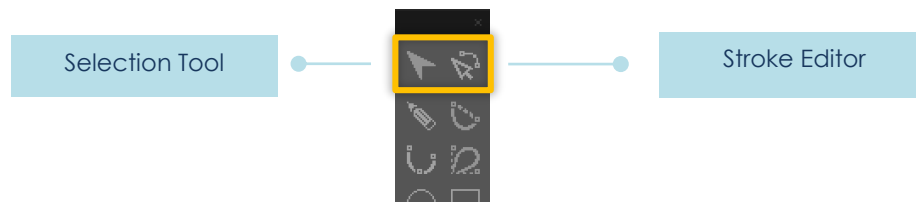
With CACANi's paperless workflow, we have created tools that will help you produce animation drawings of utmost finesse. From stroke selection to gap closing to segment hiding, these editing tools will allow you to prepare the sequence for colouring.

Common Tool Properties

There are a number of tools which share similar property controls. As such, we'll have a more thorough explanation when the property is first listed, while subsequent similar properties will only make references to these descriptions.

Editing Tools

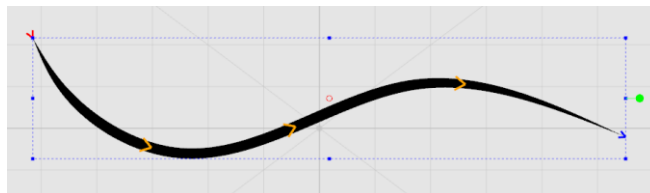
The Editing Tools are used for stroke and reference image selection and adjustments.



Selection Tool

Allows you to make selections and adjust strokes, groups, and reference images on the canvas. Selection is done by left clicking on the element, or dragging a selection box to select multiple elements.

Hold down **[Shift]** to select multiple elements. Hold down **[Alt]** to deselect elements. Once an element is selected, its bounding box will appear.

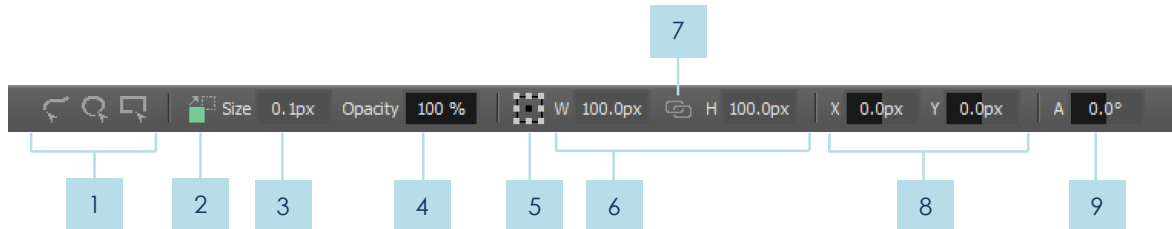


To **move selected elements**, left click on one of the elements and drag to the desired location. Left clicking on the canvas, either within or outside of the bounding box, clears the selection.

To **resize selected elements**, left click and drag on one of the bounding box handles. To resize elements **proportionally**, hold down **[SHIFT]** while left clicking and dragging the handles.

To **rotate selected elements**, left click and drag the green circular handle in a clockwise or anti-clockwise motion. The elements will be rotated with respect to the pivot (small red circle). If you want to change the centre of rotation, left click and drag the pivot to the desired position before rotating.

Selection Tool Properties



1 Selection Modes

Allows you to select strokes using **Line Selection**, **Region Selection** or **Rectangular Selection** Modes.

Line Selection Mode

Allows you to select strokes by moving your cursor over the strokes.

Region Selection Mode

Allows you to select strokes by forming a freeform region around the strokes. Strokes that are partially within the region are also selected.

Rectangular Selection Mode

Allows you to select strokes by forming a rectangular region around the strokes. Strokes that are partially within the region are also selected.

2 Apply to Coloured Regions

When enabled, coloured regions will be updated whenever strokes are moved, scaled or rotated.

3 Size

Sets the maximum width of selected strokes.

4 Opacity

Sets the opacity / transparency of selected strokes.

5 Resizing Anchor

Sets the anchor for the Resizing of selected elements.

6 W and H (Resizing)

Width and Height of the selected elements, in pixels. Both values can be changed by dragging the slider, or left clicking and typing a specific value.

7 **Maintain Aspect Ratio**

When enabled, changing either the width or height of selected elements will lead to a corresponding change in the other.

8 **X and Y (Translation)**

Horizontal and Vertical positions of the centre of the selected elements. A positive **X** value SHIFTS the elements right, whereas a positive **Y** value SHIFTS the elements up.

9 **Angle (Rotation)**

Rotation angle of the selected elements. A positive value rotates the elements in the clockwise direction, whereas a negative value rotates the elements in the anti-clockwise direction.

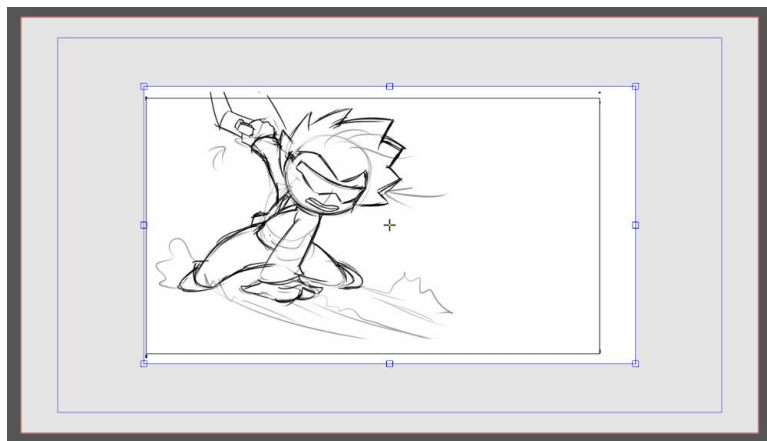
Reference Images

The Selection Tool is also used to adjust and unload reference images.

Loading / Unloading Reference Images

(Refer to [Loading Reference Images](#) on how to load external images)

To unload an image, the **Reference Layer** in the **Cel Bank** must be active. Then use the Selection Tool to click on the reference image on the canvas. It will be outlined in red. Right Click to bring up the Context Menu, then select **Remove Selected Images**.



Resizing, Rotating, Moving the Reference Image on the Canvas

To adjust a reference image, the **Reference Layer** in the **Cel Bank** must be active. Then use the Selection Tool to click on the reference image on the canvas. It will be outlined in red, with adjustment handles.

To select multiple reference images, hold down **SHIFT** and left click on each of the reference images. Alternatively, left click and drag the cursor over the reference images to select them.



To **Resize** the reference image(s), left click and drag on any of the 8 handles.

If the **Maintain Aspect Ratio** option is enabled (in Property bar), dragging on any of the **4 corner handles** will resize the reference image proportionally.

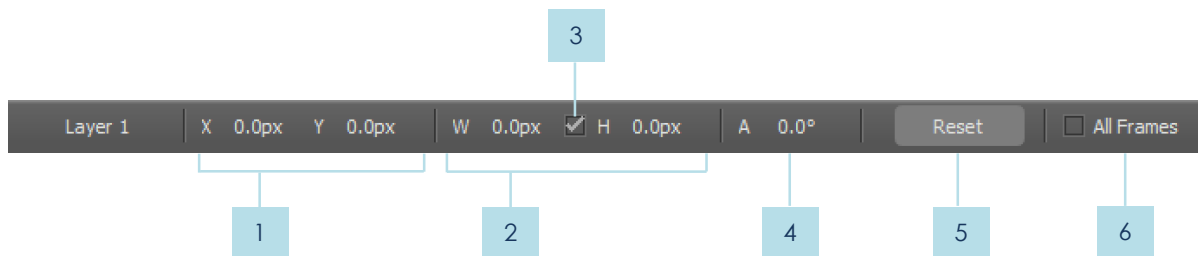
Alternatively you can also hold down **SHIFT** while dragging the corner handles

To **Rotate** the reference image(s), left click and drag anywhere along the edge of the image.

To **Move** the reference image(s), left click anywhere within the image and drag.

Reference Image Tool Properties

When a reference image is selected, the Selection Tool properties will have different options.



1

X and Y (Translation)

Horizontal and Vertical positions of the centre of the reference image, in pixels. A positive **X** value moves the image right, whereas a positive **Y** value moves the image frame up.

2

W and H (Scaling)

Width and Height of the reference image, in pixels. Both values can be changed by dragging the slider, or left clicking and typing a specific value.

3

Maintain Aspect Ratio

When enabled, changing either the width or height of the reference image will lead to a corresponding change in the other dimension.

4

Angle (Rotation)

Rotation angle of the reference image. A positive value rotates the image in the clockwise direction, whereas a negative value rotates the image in the anti-clockwise direction.

5

Reset

The translation, scaling and rotation values of the reference image are reverted to their original values.

6

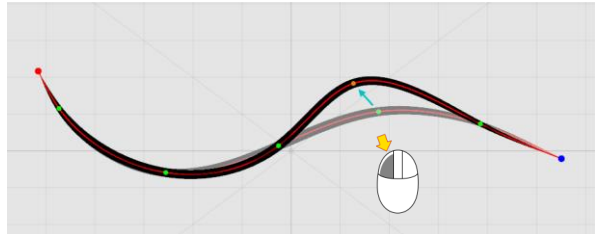
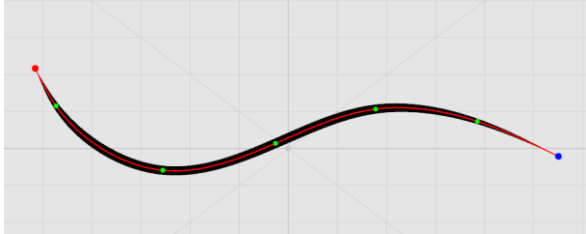
All Frames

When enabled, changes to the reference image properties will affect the reference images in all the frames in the layer.

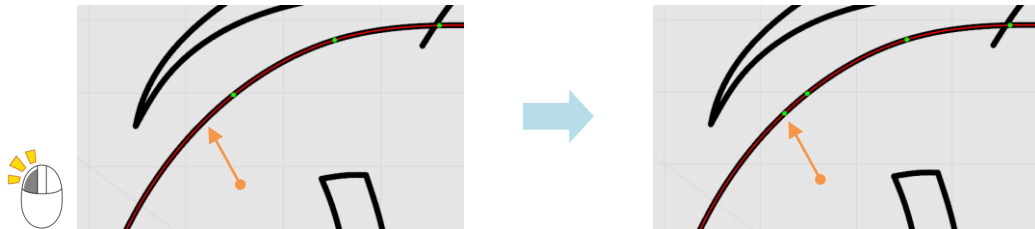


Stroke Editor

Allows you to edit data points on a stroke to adjust its path. This is done by first move the cursor over the stroke to highlight it. To change the path of a stroke, Left Click and Drag on a data point.



To **add a data point**, left click on any part of the stroke that does not already have a data point. A new data point will be created.

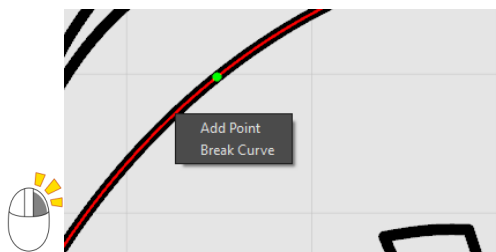


To **remove a data point**, hold down [ALT] and Left Click on any existing data point. The selected data point will be removed.

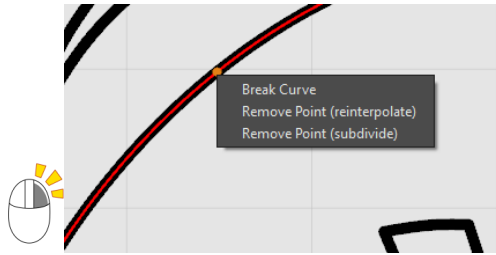
Stroke Editor Context Menu

Alternatively, you can access stroke editing options via the context menu.

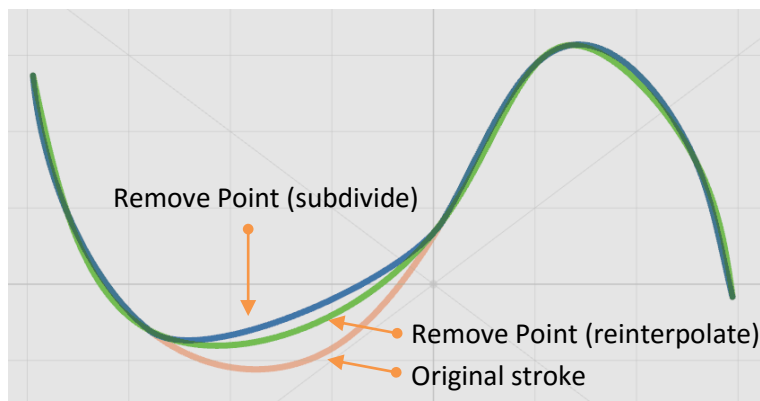
Hover over any part of the stroke without a data point and Right Click to bring up the context menu. Select **Add Point** to create a new data point.



To remove data points, hover over a data point and right click to bring up the context menu.

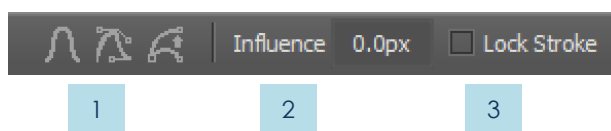


For removal of data points, there are 2 options in the context menu: **Remove Point (reinterpolate)** and **Remove Point (subdivide)**. The difference is that the former option adjusts the whole stroke to make it smoother, while the latter changes only the segment where the data point was removed.



A stroke can also be separated into 2 strokes by selecting the **Break** option from the context menu. This option can be found in both the Add and Remove Point context menus.

Stroke Editor Properties

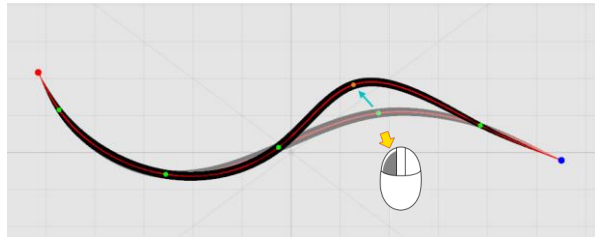
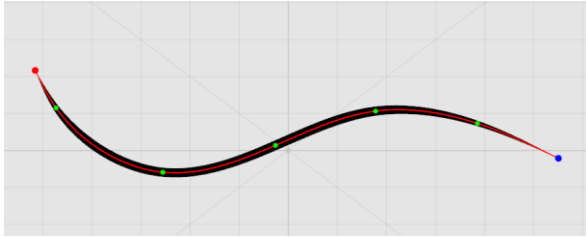


Stroke Edit Modes

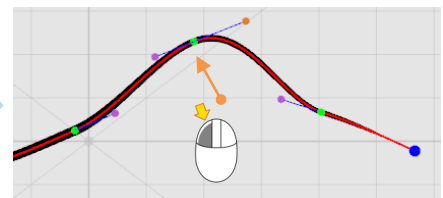
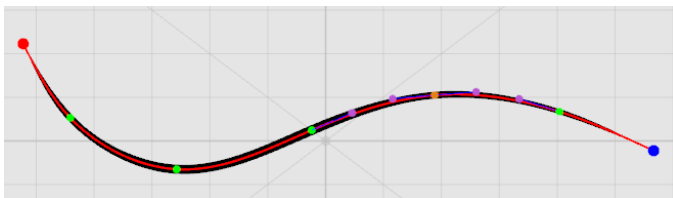


When adjusting strokes with **Smooth Edit** mode selected, smoothness within the segments of a stroke is maintained. You can adjust the path of the stroke by left clicking and dragging the data points (green points) and end points (red and blue

point). The selected stroke will be highlighted in red, and the selected point will be displayed as an orange dot.

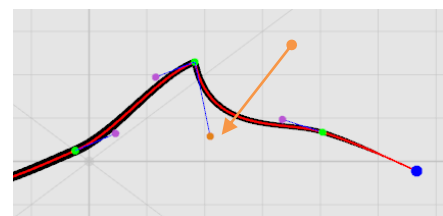
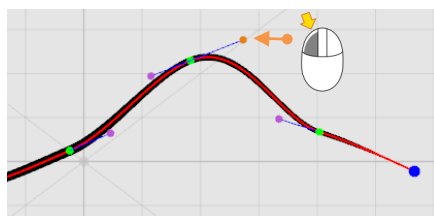


When adjusting strokes with **Control Point Edit** mode selected, segments of a stroke can be either continuous or discontinuous. The control points (purple points) of a selected data point and its adjacent data points are displayed. When editing, only the segment around the selected data point will be affected.

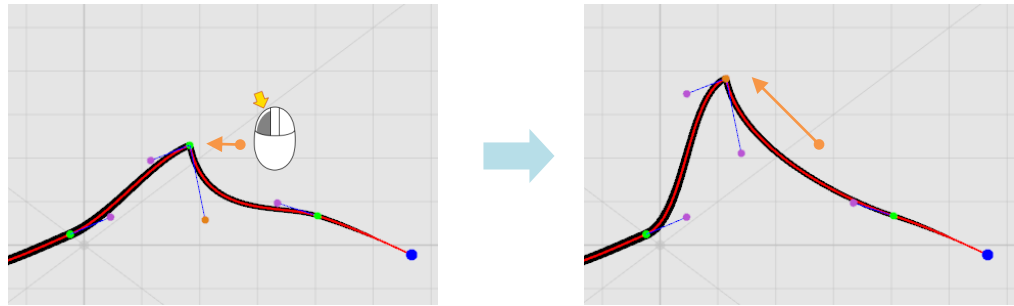


When moving data points, stroke path is continuous.

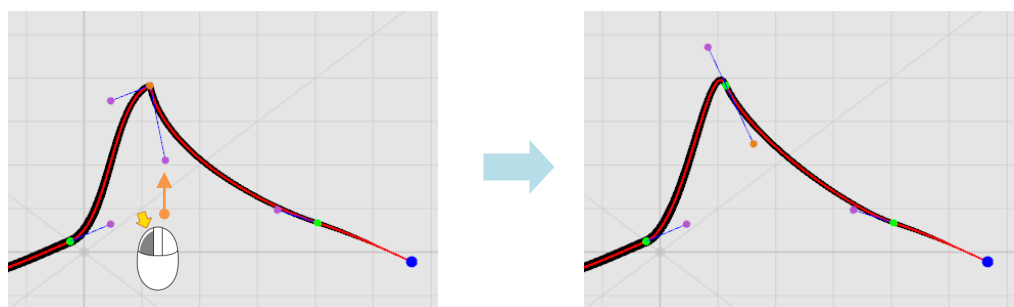
To create sharp corners in the stroke, hold down **[Ctrl]** while dragging the control points. The stroke is now discontinuous.



After the stroke is made discontinuous, the sharp corner will be maintained, even when moving the point.



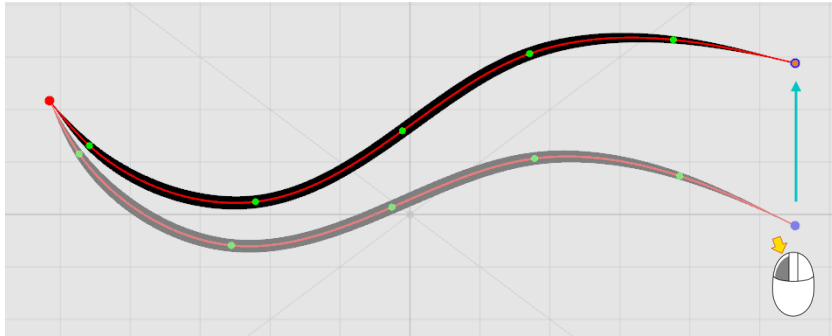
However, moving a control point for a sharp corner will cause the discontinuous segment to be automatically re-adjusted into a continuous segment.



To maintain the sharp corner while moving the control point, hold down **[Ctrl]** while dragging.

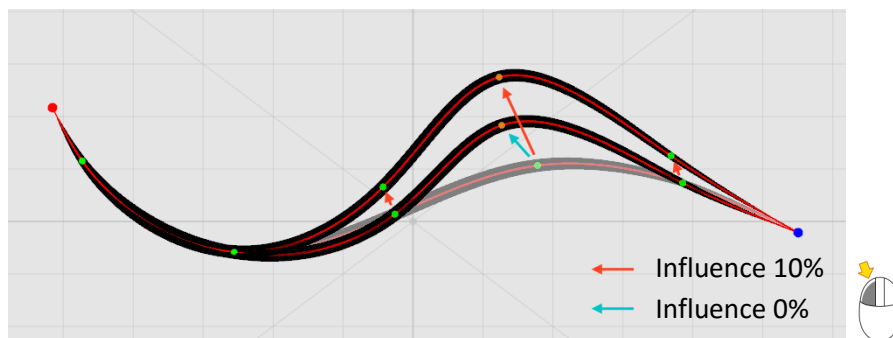


When **Fixed Ends** mode is selected, only the 2 end points of a stroke can be selected. When you select and drag one end point, the other end point will be fixed and will act like a pivot. The stroke then can be rotated or resized according to this pivot.



Influence

Controls how many adjacent points are affected by a data point adjustment in the stroke. With a higher influence, the movement of adjacent points will become larger. At 0% influence, the adjacent data points are not affected.



Lock Stroke

When enabled, a stroke remains selected during the editing of its points, or when the cursor hovers away from it.

Animation Editing Tools

The Animation Editing Tools are used when you need to adjust the generated strokes in the in-between frames.



Feature Point Tool

Allows you to adjust the deformation of a generated stroke in an in-between frame. Please see [Chapter 08 – Using the Feature Point Tool](#) for more information.

Feature Point Tool Properties



Remove All Feature Points

Allows you to clear all feature points on the selected stroke.



Bone Tool

Allows you to change the way strokes are generated in a group in an in-between frame. Please see [Chapter 08 – Using the Bone Tool](#) for more information.

Bone Tool Properties



1 Remove Bone

Allows you to clear the paths for the selected stroke group.

2 Points

Defines the number of points present on the created path.

3 Maintain Bone Length

When enabled, the paths for a stroke group will be constrained by the length of the drawn bones in the key frames.

4 Stroke Edit Modes

Allows you to edit data points on a stroke to adjust the paths of the stroke groups. Please see [Chapter 05 – Stroke Editor Properties – Stroke Edit Modes](#) for more information.

5 Lock Path

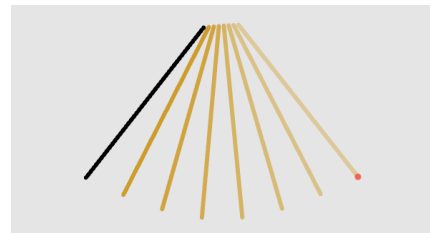
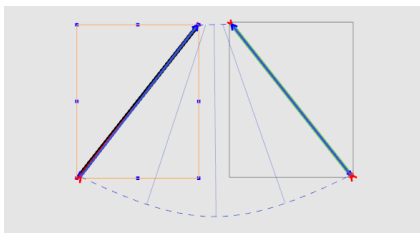
When enabled, the path is kept selected and can be edited more easily.

6 Bone Rotation Paths

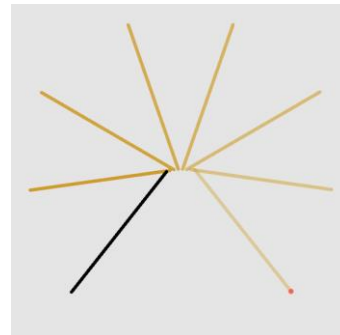
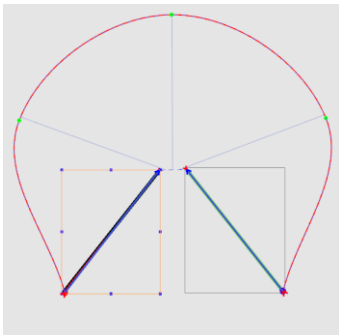
Allows you to change how the paths are generated based on the angle of rotation.

Set Path Small Rotation

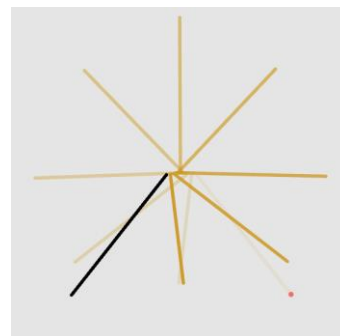
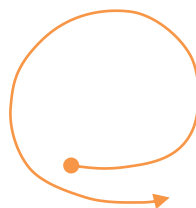
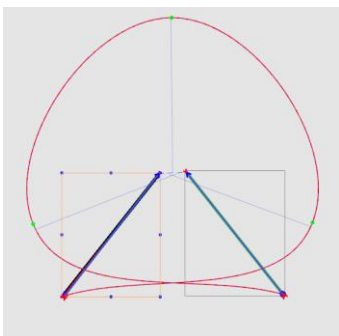
The in-between frames for the stroke group are generated based on an angle of rotation less than 180° .

**Set Path Middle Rotation**

The in-between frames for the stroke group are generated based on an angle of rotation larger than 180° but smaller than 360° .

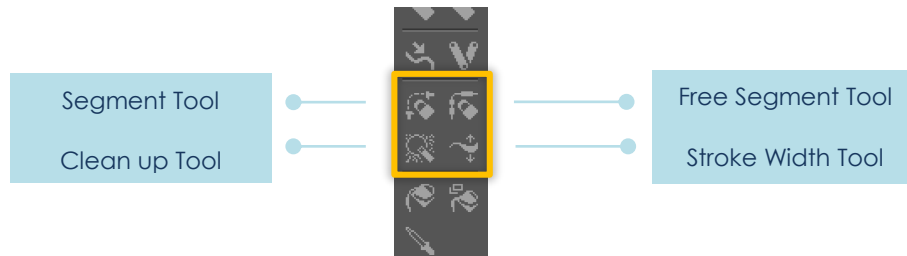
**Set Path Large Rotation**

The in-between frames for the stroke group are generated based on an angle of rotation larger than 360° but smaller than 540° .



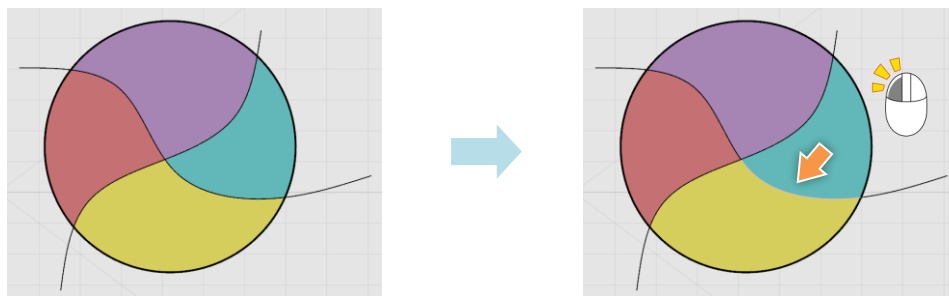
Segment Editing Tools

The Segment Editing Tools are used for cleaning up and adjusting the look of the strokes. They are also very important for ensuring that the drawings are ready for painting. However, the tools do not affect the curvature of the strokes.



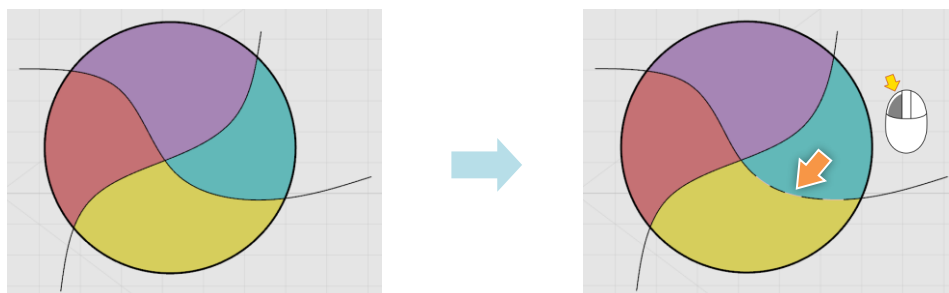
Segment Tool

Allows you to alter the visibility of sections of a stroke, where the sections are created by intersections with other strokes.



Free Segment Tool

Allows you to alter the visibility of sections of a stroke, regardless of any intersections with other strokes.



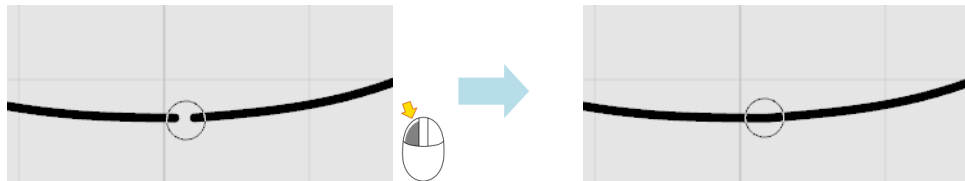


Clean Up Tool

Allows you to edit how strokes are attached to each other to form closed regions for painting. The Clean Up Tool can perform **3 different functions**, depending on the proximity of the strokes.

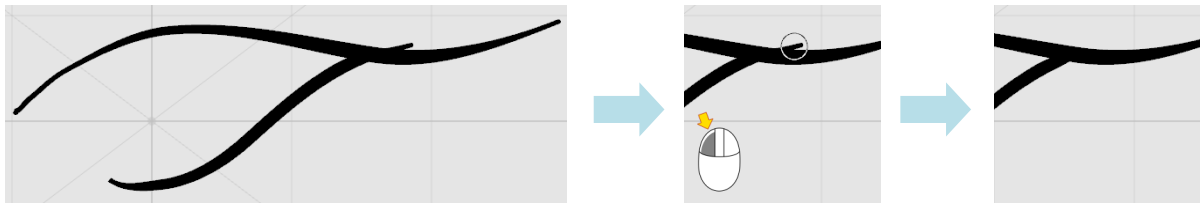
Gap Closing

At least 1 stroke end must be within the selected region for the tool to work.



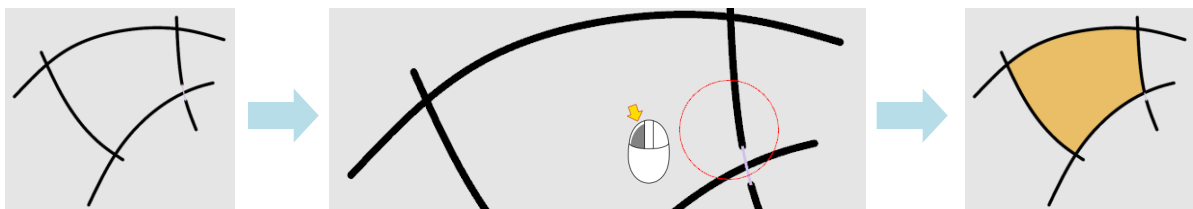
Artifact Removal

Allows you to remove stroke artifacts, or unwanted stray ends, during the drawing process. Stroke artifacts falling within the threshold region are removed.



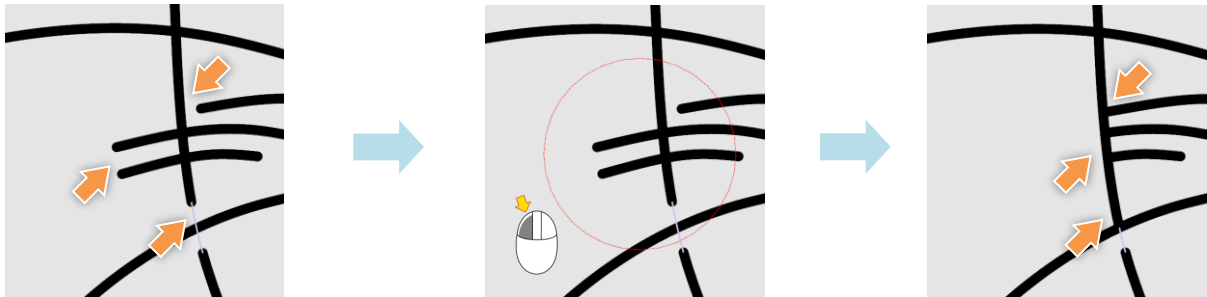
Hidden Segment Cleanup

Allows you to convert hidden segments back to visible segments, without having to switch to the **Segment** or **Free Segment Tools**. This is helpful when regions are not closed due to hidden segments.



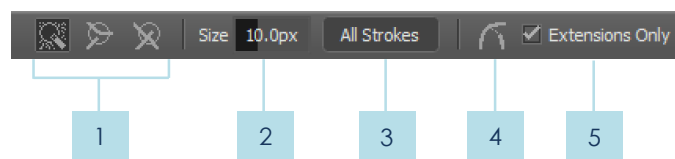
Clean Up Modes

You can switch between different Clean Up modes in the tool. The **Combined Mode** allows you to perform the above 3 functions at once. However, depending on the complexity and proximity of the selected strokes, results will vary.



The other 2 modes, **Gap Close Only** and **Artifact Removal Only**, as their names suggest, limits the Clean Up Tool to only perform gap closing operations or artifact removing only operations respectively. This can help with certain situations where there are many intersecting strokes.

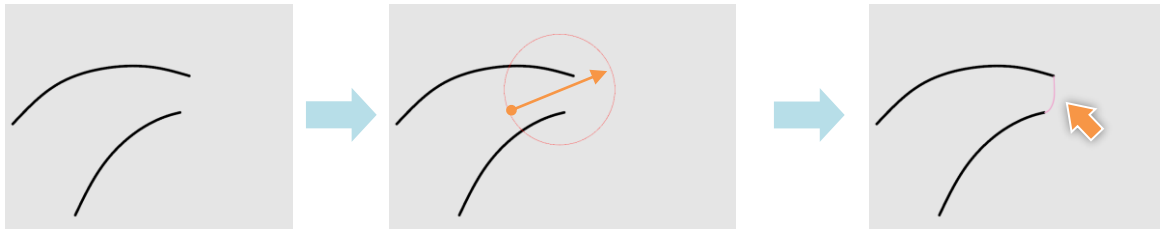
Clean Up Tool Properties



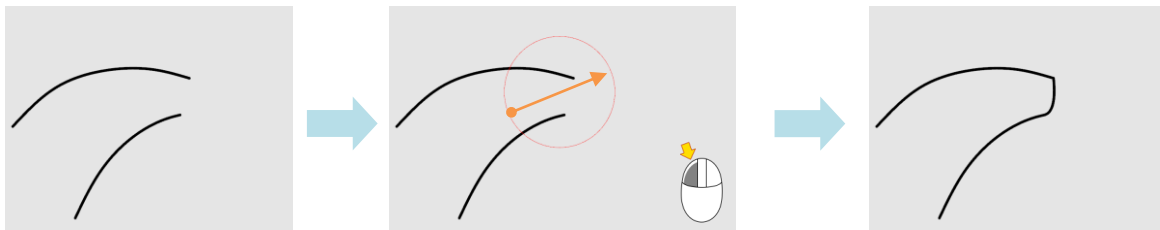
- 1 Clean Up Modes**
Allows you to specify whether the tool works in **Combined**, **Gap Close Only** or **Artifact Removal Only** Mode.
- 2 Size (Apply to All Strokes only)**
Sets the gap close or artifact removal threshold region for the **Apply to All Strokes** option. A larger value results in wider stroke gaps closed or longer stroke artifacts removed.
- 3 Apply to All Strokes**
Allows you to close all stroke gaps and artifacts in the drawing that are within the region defined in the **Size** property. However, some strokes may be altered in an undesirable way.

4 Keep Gaps Invisible

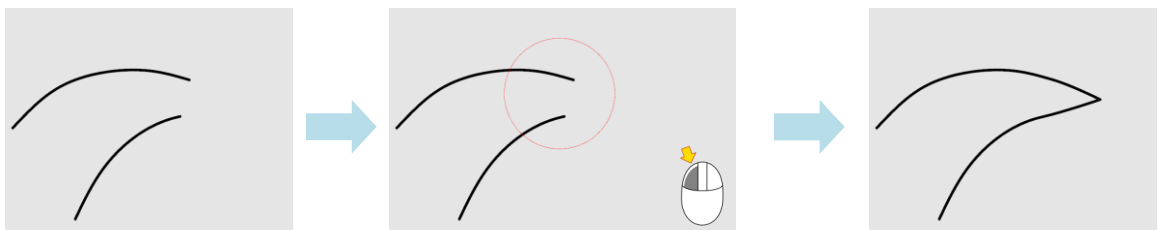
When enabled, any gaps closed using the Clean Up Tool are performed with invisible strokes so that the strokes do not appear to be altered.

**5 Extensions Only Mode (Gap closing)**

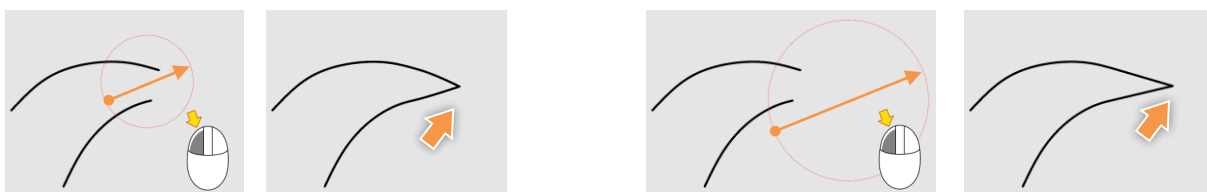
When disabled, stroke ends within the threshold will be extended to connect to each other, regardless of the strokes' directions.



When enabled, the stroke ends will be extended and connected to each other.



With the **Extension Only Mode**, using different threshold sizes will result in different stroke extensions, as the **circumference of the threshold determines where the connection point is**.





Stroke Width Tool

Allows you to change the stroke width at different segments of a stroke. You can adjust the stroke width by left clicking on any of the data points or endpoints, and dragging the mouse **left** (decrease stroke width) or **right** (increase stroke width).



Stroke Width Tool Properties

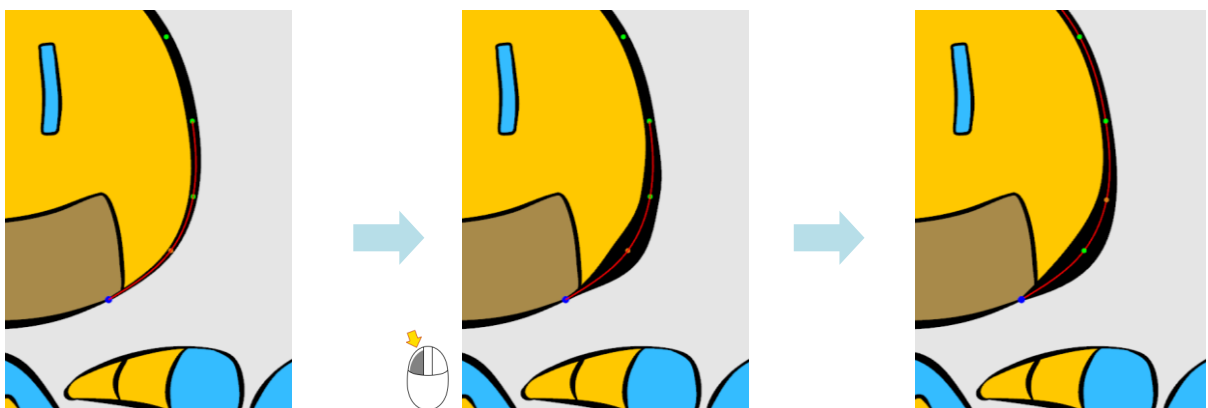


1 Width

Sets the maximum width of selected strokes.

2 Range

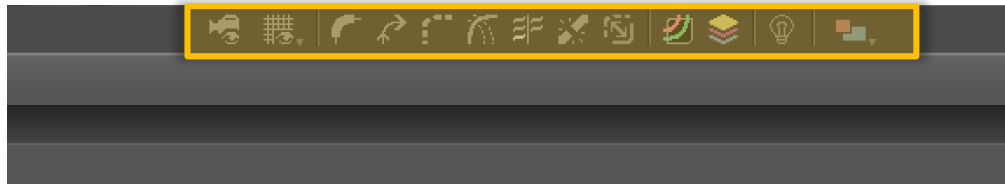
Sets the number of adjacent data points that are affected by the stroke width change. Note that after the width adjustment, you will also need to move the data point slightly with the **Stroke Editor** to get a smooth width transition.



06

Using Display Tools

Displaying Information on the Canvas



While drawing, animators frequently need to see information about their drawings, from camera frames to measurement grid and stroke gaps. However, it can be very messy when all the information are switched on at the same time. In CACANi, these display modes are arranged at the top of the interface so that they can be activated when needed.

Display Property Bar

The **Display Property Bar** is divided into a few sections.



Canvas Display Modes



Camera

When enabled, it allows you to see the camera frame on the canvas. The camera boundary is shown as a red rectangle, while the video safe frame is in blue.



Grid / Field Chart

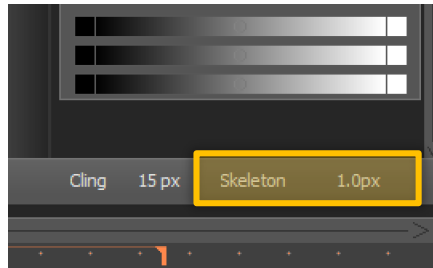
Allows you to display a rectangular grid and/or field chart over the canvas. This will help with the planning and layout of drawings within the canvas.

Stroke Display Modes



Stroke Width

When enabled, the actual stroke width is displayed. When disabled, the Stroke Skeleton is shown, for more accurate drawing. In addition, the stroke skeleton can be thickened using the Stroke Skeleton slider for easier viewing.



Stroke Direction

When enabled, strokes selected with the Selection tool will have arrows displayed on them. These arrows indicate the direction in which the stroke was drawn and will allow you to draw matching strokes in subsequent frames correctly.



Invisible and Hidden Strokes

When enabled, invisible and hidden strokes will be displayed in the canvas in pink and purple respectively.



Fade Non-Active Layers

When enabled, strokes on unselected layers will be faded out. By only showing specific sections of a drawing, this can help you to focus on those areas and not be confused.



Grey out Matched Strokes (Navigator only)

(Only applicable to Navigator Panel, Reference Frame turned on) When enabled, strokes that are already matched or corresponded will be displayed as grey strokes, instead of the strokes' original colour. This can help you to identify the remaining strokes to match.

Please see [Chapter 08 – Grey Out Matched Strokes Display Mode](#).



Stroke Gaps

When enabled, stroke ends which are not connected to any other stroke will be indicated with a light orange circle.



Switch Hidden Stroke View

When enabled, normal strokes will be faded out while invisible and hidden strokes will be displayed clearly to allow you to draw the strokes easily.



Colour Separation Strokes

When enabled, strokes selected with the Selection tool will have arrows displayed on them. These arrows indicate the direction in which the stroke was drawn and will allow you to draw matching strokes in subsequent frames correctly.



Toggle Lightbox Display

When enabled, drawings on previous or subsequent frames are displayed on the canvas as onionskinned images. For configuration of onionskinned images, you can use the **Lightbox Settings Panel**.

Region Display Modes



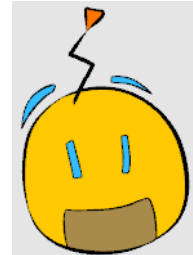
Hide Region Colours

When enabled, no region colours are displayed.



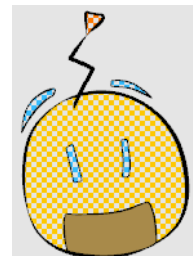
Show Region Colours

When enabled, filled regions will be displayed in their original colours.



Highlight Self Regions

When enabled, all self-layer regions will be displayed with checkered patterns.



Show Closed Regions

When enabled, all regions that are closed and do not have any gaps will be painted in alternating colours. This is useful when you want to check for gaps before painting the regions.



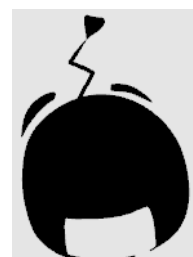
Show Closed Self Regions

When enabled, all self-layer regions that are closed and do not have any gaps will be painted in alternating colours with checkered patterns.



Show Painted Regions

When enabled, all regions that have been filled with colour will be painted in black. This is useful when you need to verify that you have not missed any regions that require painting.

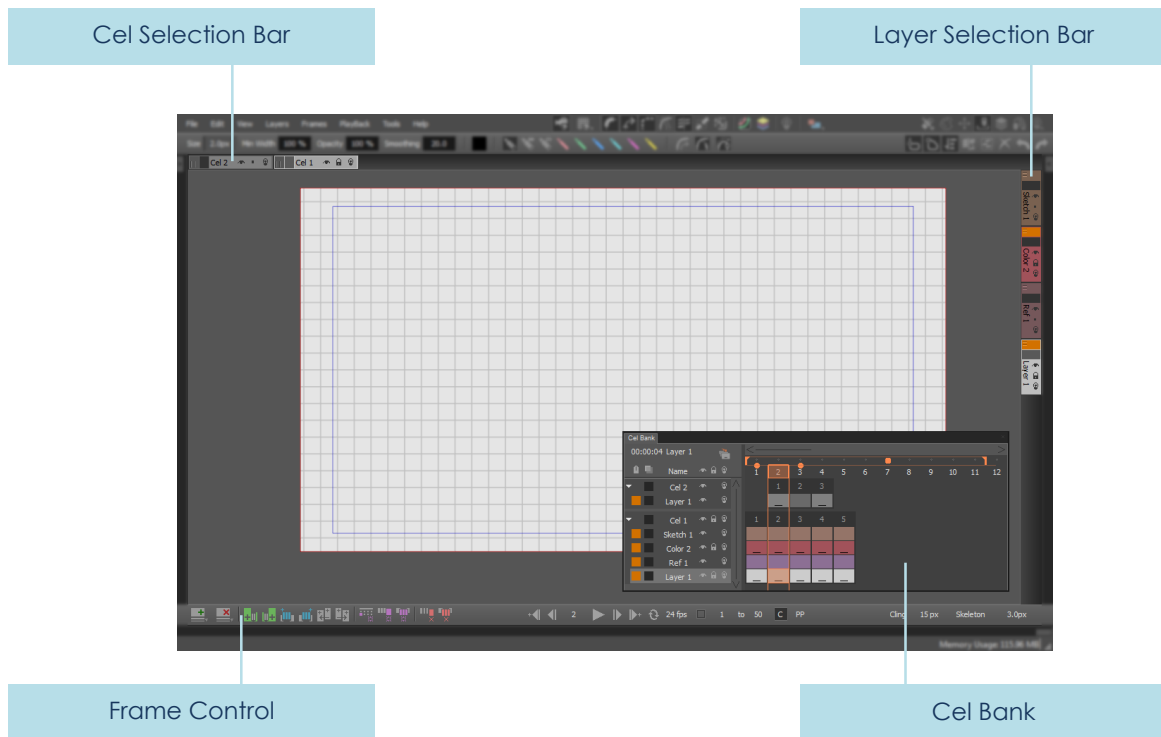


Please refer to [Chapter 10 - Cross Layer and Self-Layer Regions](#) for more information on regions.

07

CACANi Cel System

The Cel System



The Cel System is used for the management of layers and frames for animation. Cels, Layers and different types of frames can be added or removed, their orders changed and management for drawing and animation.

Cel Selection Bar

Allows you to access cels and adjust various cel-related settings easily.

Layer Selection Bar

Allows you to access layers and adjust various layer-related settings easily.

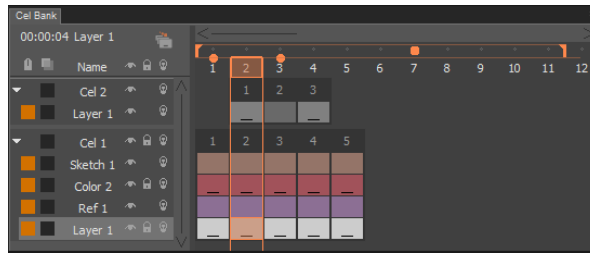
Frame Controls

Allows you to create or remove cels, layers or frames.

Cel Bank

Allows you to perform all cel, layer and frame operations.

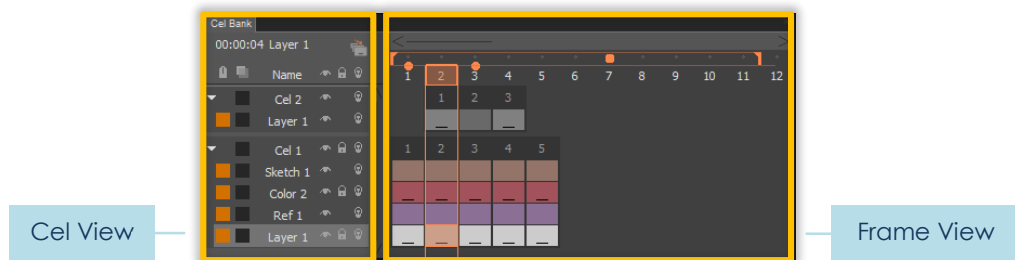
Cel Bank



In CACANi, the Cel Bank is the main location for frames, layers and cels creation and editing, while the Cel / Layer Selection Bars and Cel Control Bar provide supplementary support.

While the Cel Bank is a panel that can be moved around, docked or hidden from view, the Cel Selection Bar, Layer Selection Bar and Cel Control Bar are fixed on the user interface for ease of use.

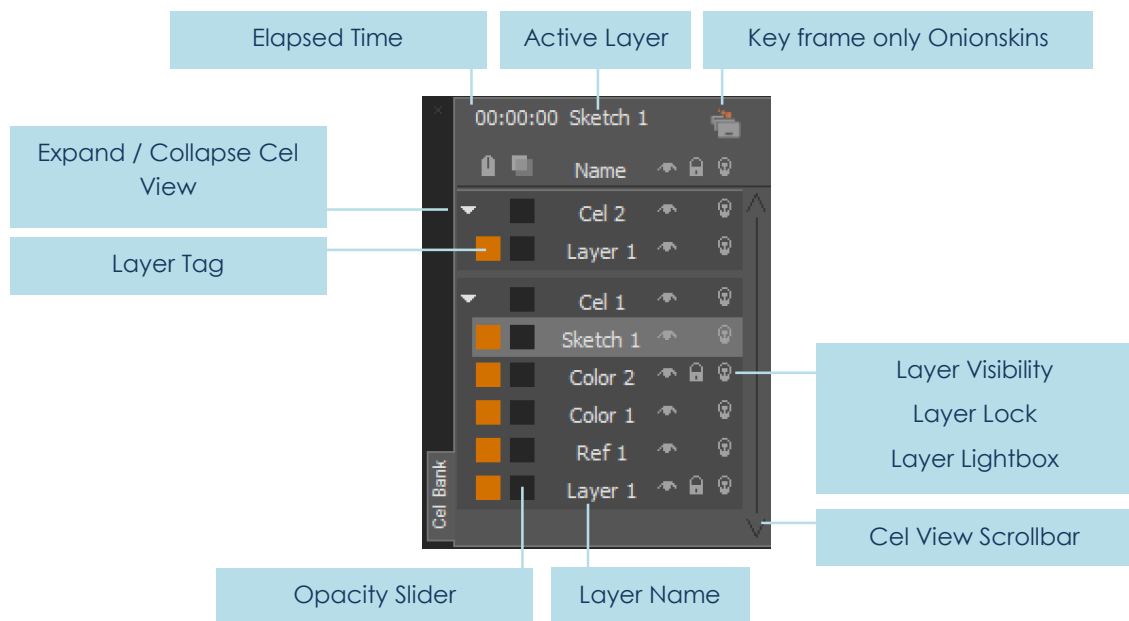
Sections of the Cel Bank



The Cel Bank consists of 2 distinct components, the Cel View section and the Frame View section.

The **Cel View** shows the cel / layer names and allows you to perform cel / layer operations, while the **Frame View** shows the frames and contains the frame operations.

Cel View



Elapsed Time

Shows the time at the active frame, in (Minutes : Seconds : Frames) format.

Active Layer

Lists the current selected cel or layer.

Key frame only Onionskins

When enabled, the Lightbox will only show key frames as onionskin images.

Expand / Collapse Cel View

Reveals or hides the layers within a cel.

Colour Tag

Displays the colour tag of a layer.

Opacity Slider

Allows you to adjust the opacity level of a cel or layer.

Layer Name

Displays the cel or layer.

Layer Visibility

When enabled, the contents of the layer are displayed.

Layer Lock

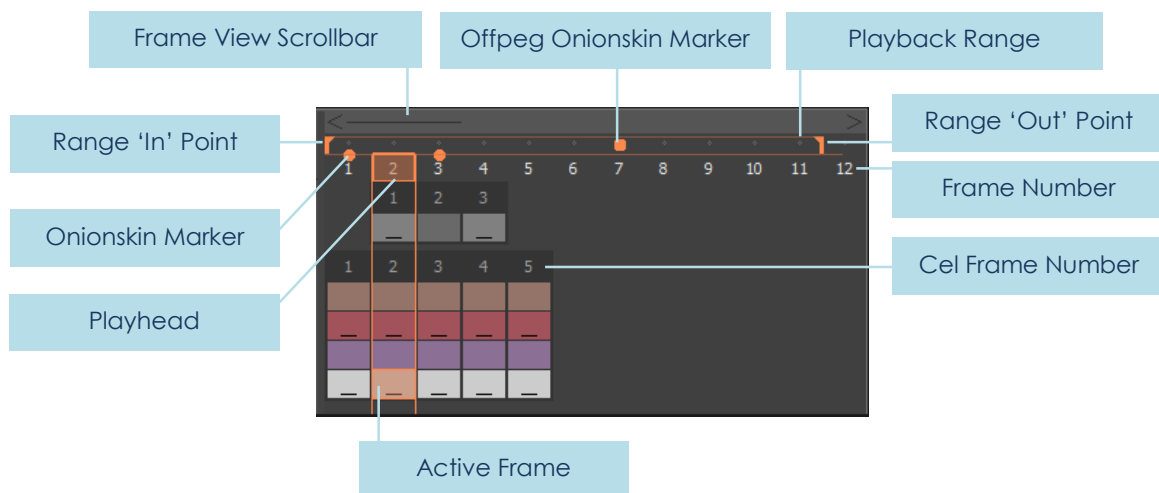
When enabled, the strokes in the layer are locked and cannot be changed.

Layer Lightbox

When enabled, the strokes in the layer are included when displaying the frame as an onionskin image.

Cel View Scrollbar

Allows you to pan vertically through the created cels and layers.

Frame View**Frame View Scrollbar**

Allows you to pan horizontally through frames and sheets.

Offpeg Onionskin Marker

When enabled, an onionskin image of the current frame is displayed on the canvas, independent of the active frame.

Playback Range

Indicates the frames that will be played back when the **Playback Range** checkbox is ticked in the **Playback Bar**.

Range 'In' Point

Allows you to adjust the starting frame of the Playback Range.

Range 'Out' Point

Allows you to adjust the ending frame of the Playback Range.

Onionskin Marker

When enabled, an onionskin image of the current frame is displayed on the canvas. Unlike the Offpeg Onionskin, this is always in relation to the active frame.

User Manual

Playhead

Indicates the location of the active frame. You can drag the Playhead to make another frame active.

Active Frame

Indicates the current selected frame in the cel bank.

Frame Number

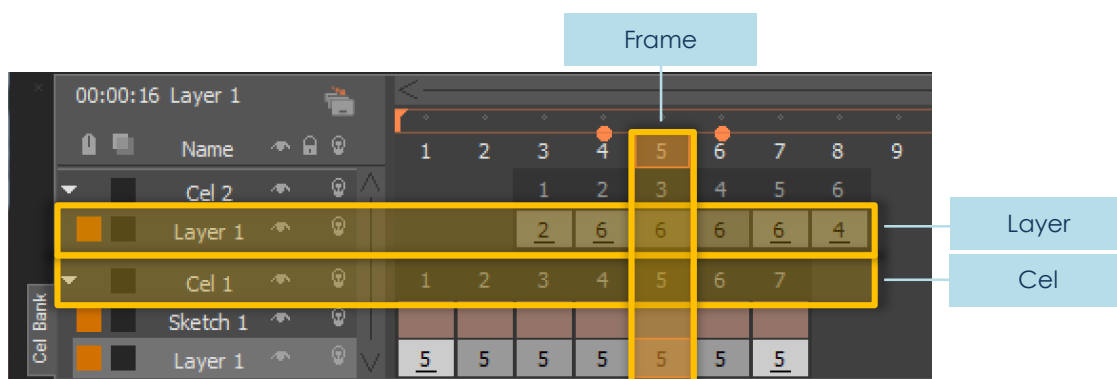
Indicates the frame number of the overall animation sequence.

Cel Frame Number

Indicates the frame number of the specific cel.

Frames, Layers, Cels

The distinction between cels, layers and frames is important to the understanding of CACANi's system of animation. With this knowledge, you will be able to make use of CACANi's unique workflow to create your animations quickly.



Frames

A frame can consist of a drawing in a single layer, or be made up of a column of drawings in multiple layers. A frame is what you see displayed on the canvas.

Layers

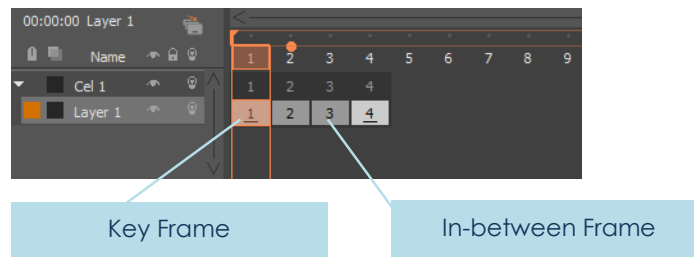
A layer is a single sequence, or row, of frames. There are different types of layers available, each with its own purpose. Layers within the same cel have the same number of frames and frame types.

Cels

A cel is a master layer that can hold multiple layers. Cels can have different number of frames from each other.

Frame Types

In CACANi, there are 2 types of frames, **key frames** and **in-between frames**.



Key Frames

Frames that hold drawings created by the animator. They are normally at the beginning and ending part of an animation sequence. Key frames are denoted with a dash beneath the stroke numbers.

In-between Frames

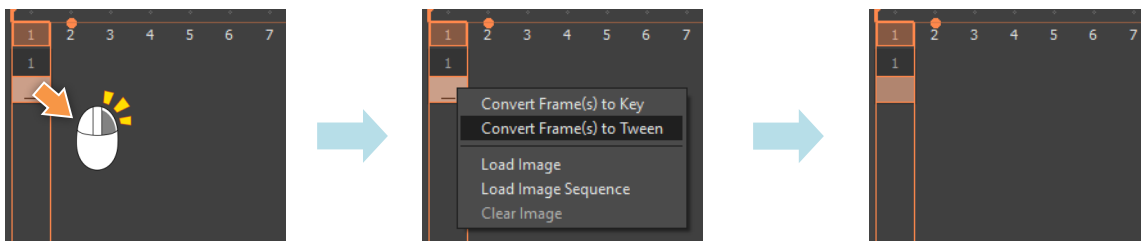
Transition frames that are generated based on the key frames. Information between matching strokes in a pair of key frames is used to create in-between frames. In-between frames do not have any marking beneath the stroke numbers and are coloured a darker shade of grey compared to key frames.

Note that multiple layers within a cel form a **frame**.

Conversion between Frame Types

You can turn a key frame into an in-between frame, and vice versa. This can help you to perform adjustments on the animation sequence, or as a way to create breakdown key frames.

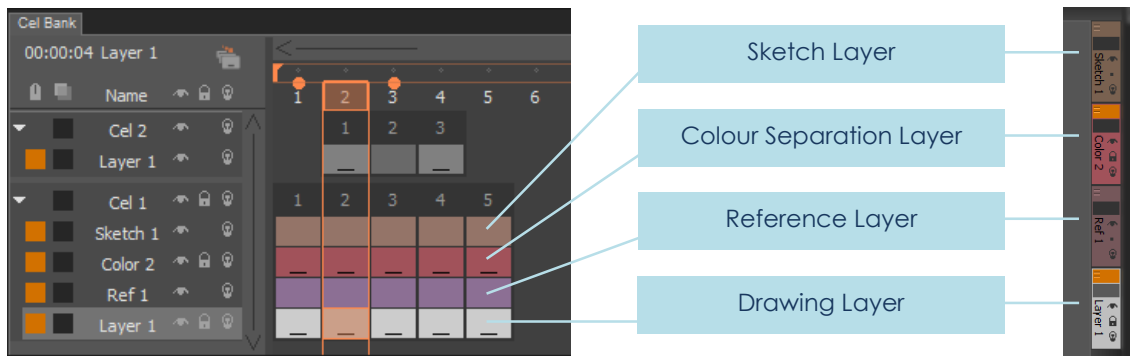
To perform this action, **Right-Click** on a frame to bring up the context menu. Since this frame is a key frame, select **Convert Frame(s) to Tween** to convert into an in-between frame.



However, you have to be extra careful when converting key frames into in-between frames, in that you do not accidentally **re-generate** in-between frames. This may cause the strokes in the newly converted in-between frame to change.

Layer Types

There are different types of layers to help you animate in CACANi. Each type is coloured differently and has a specific use. You can access them from both the Cel Bank and the Layer Selection Bar.



Drawing Layer

Most frequently used layer type. You can draw, trace, animate and paint your drawings here.

Sketch Layer

Used for roughing out your animations. Sketch layers do not have animation capabilities. In addition, you cannot paint regions formed by strokes in Sketch layers.

Reference Layer

Used for loading external files as reference images. Loaded images can be moved and manipulated using the Reference Image Settings. No drawing or animation can be done on this layer.

Colour Separation Layers

Used for drawing colour separation strokes. When **Colour Separation Display Mode** is turned off, the strokes drawn in these layers do not show up on the canvas or the exported images.

There are a total of 6 different colour separation layers: Red, Green, Blue, Cyan, Pink, Yellow.

Please see [Chapter 05 – Colour Separation Strokes](#) for more information.

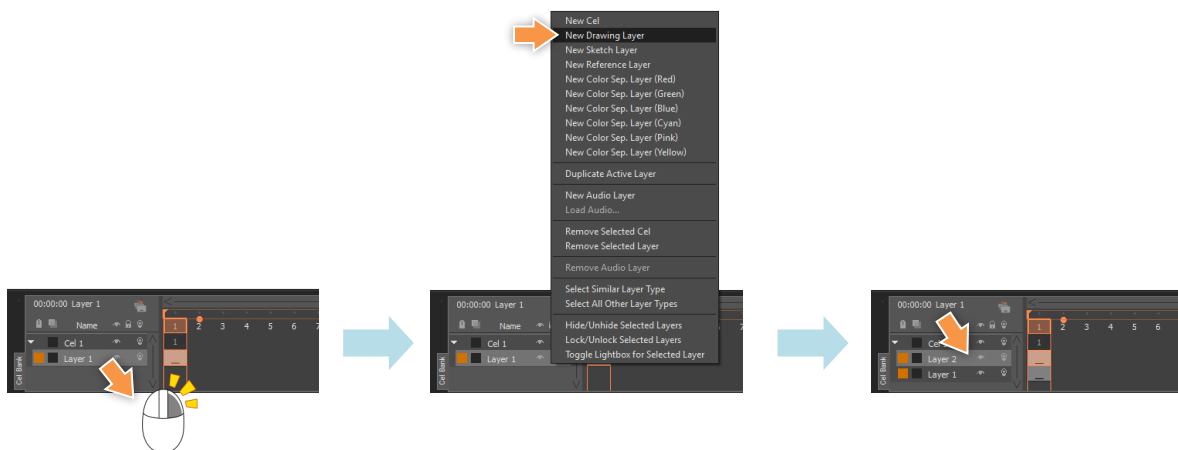
Using the Cel Bank

Cel View Interactions

This is where you can perform layer / cel creation and selection operations, as well as amend various layer statuses.

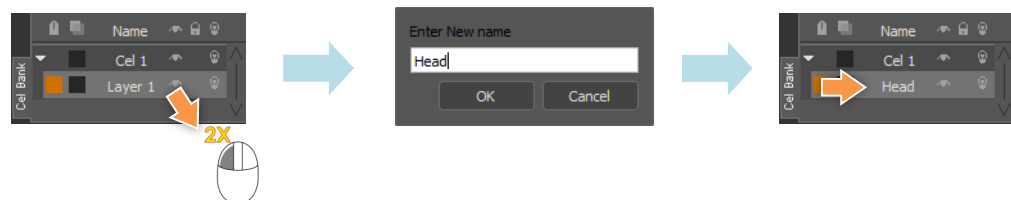
Layer / Cel Creation

You can create a new layer by **Right-Clicking** on a cel, layer, or the empty space below the layers and choosing either of the **New ... Layers** options from the dropdown menu.



Layer Name

You can rename a layer by **Left-Clicking Twice** on the name. A dialog box will pop up and the new name can be entered.



Layer Selection

When working in CACANi, there are various methods you can use to select layers:

Single Layer

A single layer can be selected easily by **Left-Clicking** directly on the specific layer. The layer will be highlighted.

Multiple Layers in Sequential Order

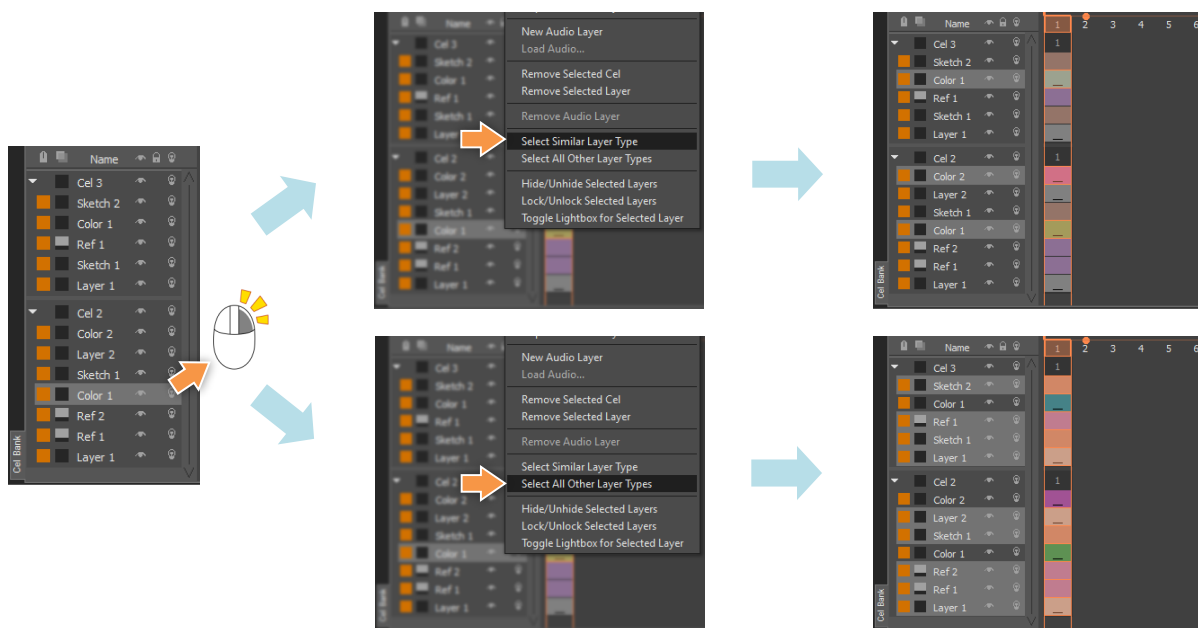
When you need to select layers arranged in sequence, start by **Left-Clicking** on the first or last layer of the sequence. Then, **Hold Down** the **SHIFT** key and **Left Click** to select the layer on the other end of the sequence.

Multiple Layers in Non-sequential Order

When you need to select layers arranged arbitrarily, start by **Left-Clicking** on any layer you wish to select it. Next, **Hold Down** the **Ctrl** key and **Left-Click** on another layer you wish to include in your selection.

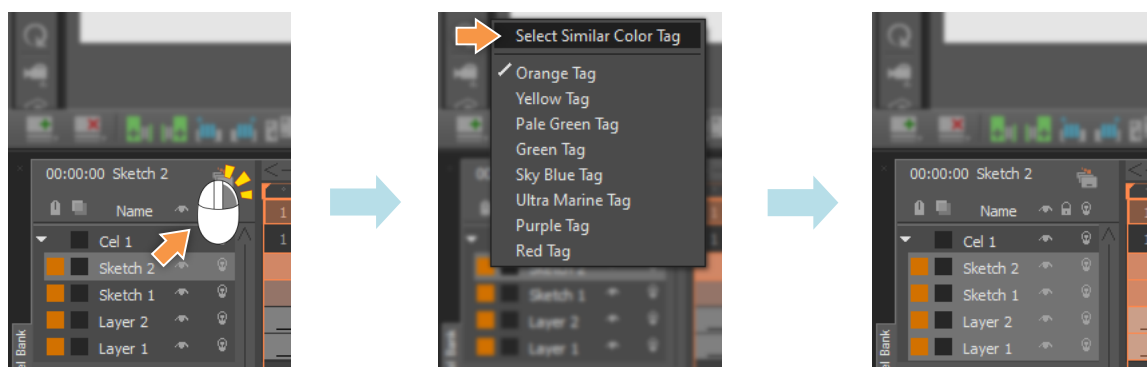
Layer Types

As there are different types of layers, you can use **Select Similar Layer Types** to only pick layers that are of the same type as the current active layer. This can be used to quickly change layer statuses for multiple layers. Conversely, you can choose **Select All Other Layer Types** to pick layers that are not of the same type as the current active layer.



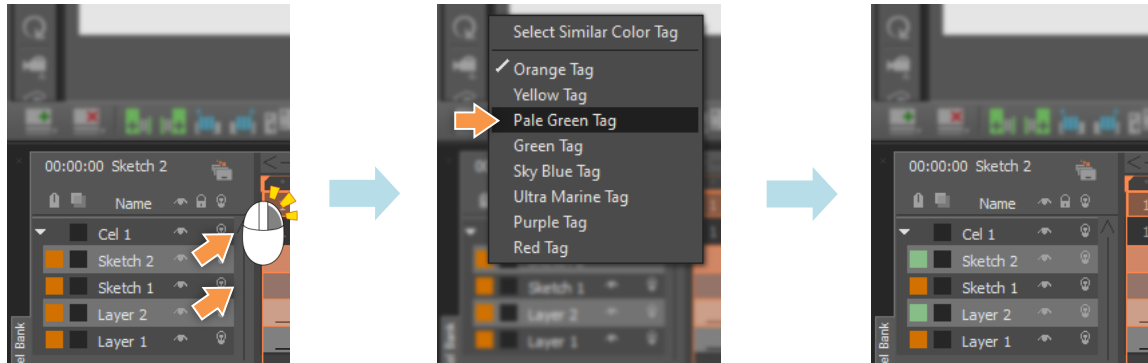
Layer Selection - Colour Tags

In addition to Layer Types, you can also assign Colour Tags to specific layers, so that you can select them easily later. All layers are assigned the Orange Tag by default. To select layers with the same Colour Tag, you can **Right-Click** on the Orange square on a layer to bring up the dropdown menu, and choose **Select Similar Colour Tag**.



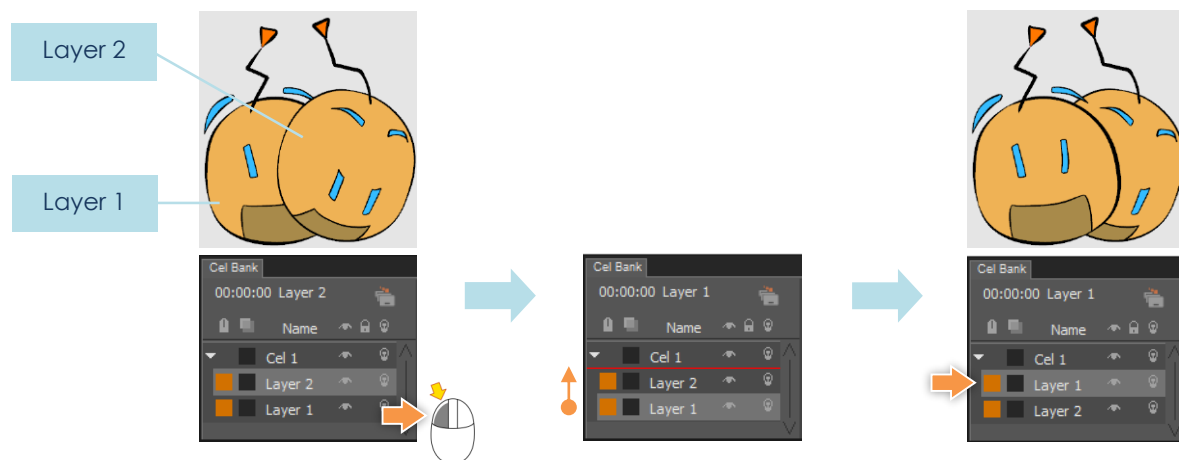
To assign a new Colour Tag, first select the required layers (using **SHIFT + Left Click** or **Ctrl + Left Click**).

Then, **Right-Click** on the Orange square on the layer and choose a different Colour Tag from the dropdown menu.



Moving Layers / Cels (Display Order)

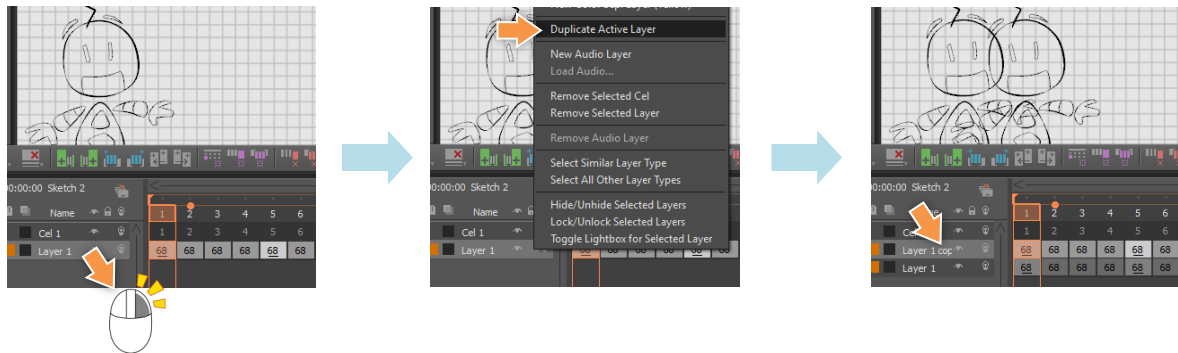
You can adjust the order of the layers or cels so that the contents of a layer are displayed above or below the rest. To do so, **Left Click and Drag** a layer to reposition it. A red line will appear to indicate where the new position of the layer will be.



User Manual

Layer Duplication

You can clone an active layer by **Right-Clicking** and choosing **Duplicate Active Layer** from the dropdown menu.



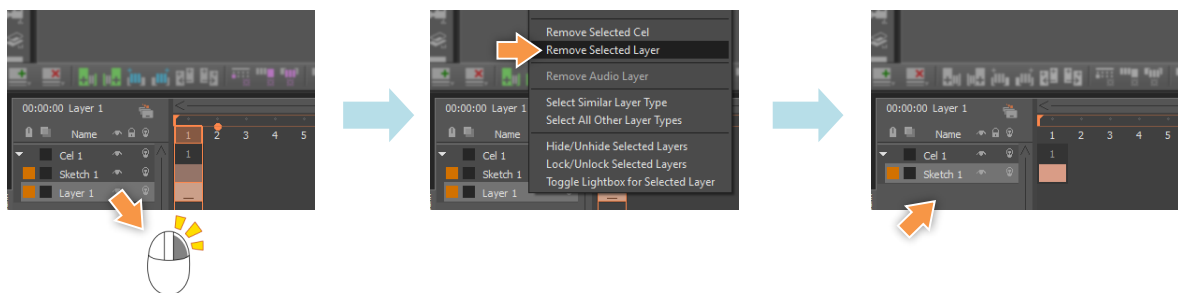
However, there is a limitation with layer duplication:

Motion paths are not duplicated.

Motion paths have to be redrawn, or manually copied from the previous layer.

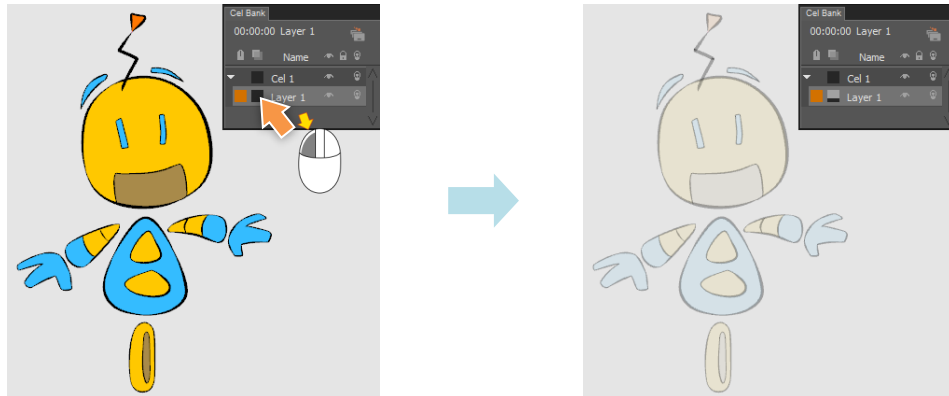
Layer Removal

You can delete a selected layer or cel by **Right-Clicking** and choosing **Remove Layer** or **Remove Cel** from the dropdown menu. In addition, multiple layers or cels can be deleted at the same time by using **SHIFT + Left Click** (for layers / cels arranged in sequence) or **Ctrl + Left Click** (for layers / cels arranged arbitrarily) to select the required layers.



Layer Opacity Slider

You can adjust the opacity, or transparency, of a layer via the Layer Opacity Slider. Left Click and Drag on the slider to vary the opacity level.

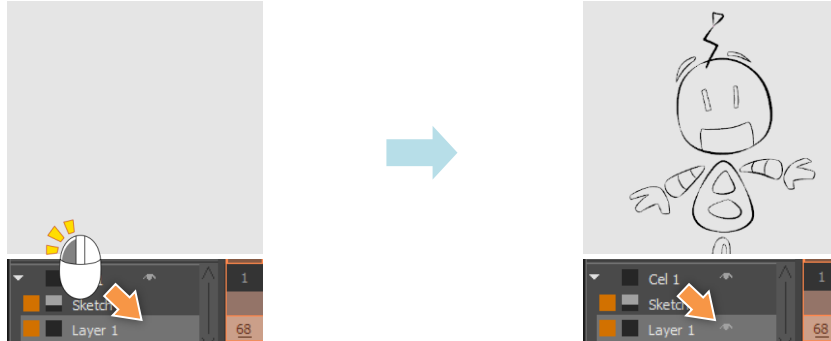


Layer / Cel Status Toggle

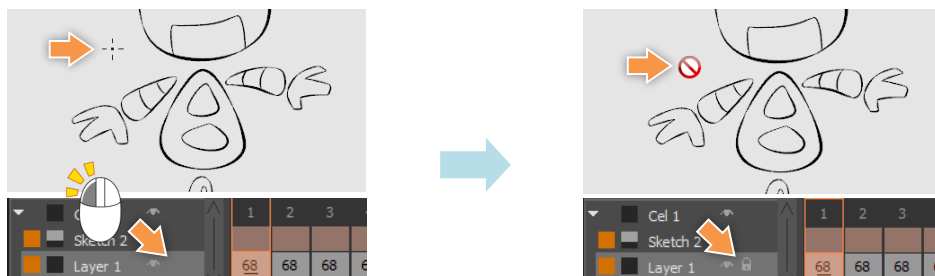
You can change the status of a layer or cel in the Cel View by enabling / disabling the icon directly.



The **Visibility** icon displays or hides the contents of the selected layer.



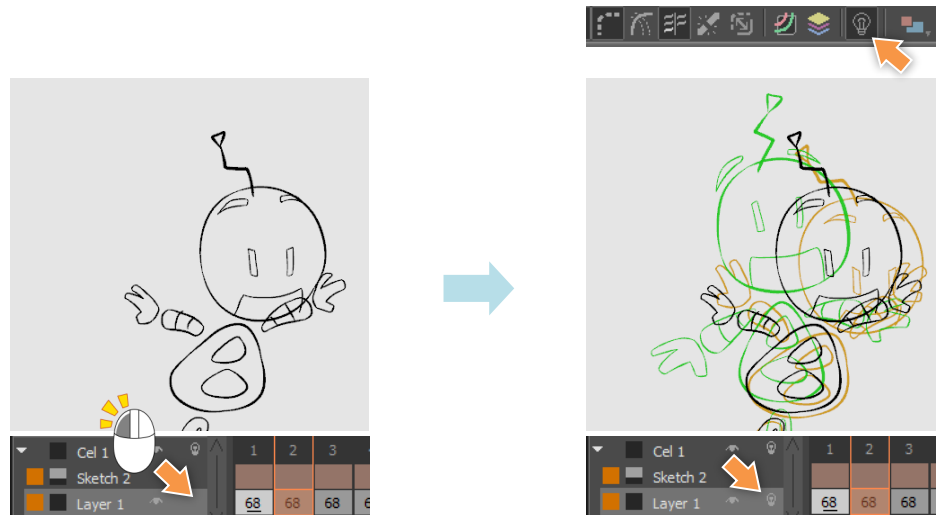
The **Lock** icon, when toggled, prevents the contents of the selected layer from being changed. The cursor icon will change to reflect the locked status of the active layer.



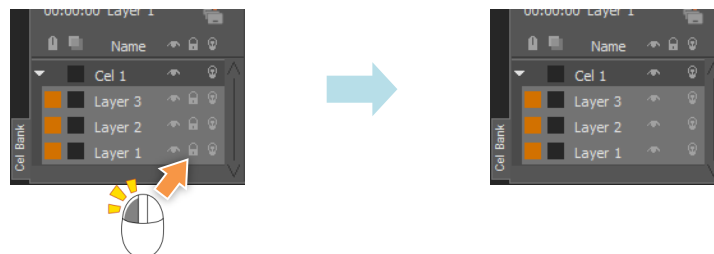
User Manual



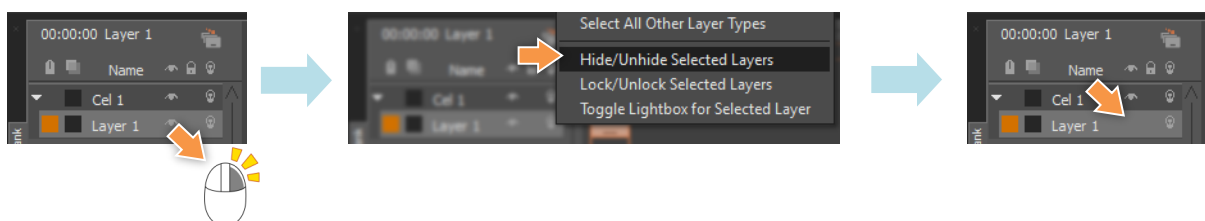
The **Layer Lightbox** icon, when toggled, includes the strokes of the selected layer when the frame is displayed as an onionskin image. Note that the onionskin image will only be displayed when the **Toggle Lightbox** option in the Display Bar is enabled as well.



To change a similar status for multiple layers / cels at the same, you can first select multiple layers / cels (using **SHIFT + Left Click Drag** or **Ctrl + Left Click**), then Left Click on the relevant status icon for one of the selected layers.



Alternatively, you can also perform the same operations by using the dropdown menu options:

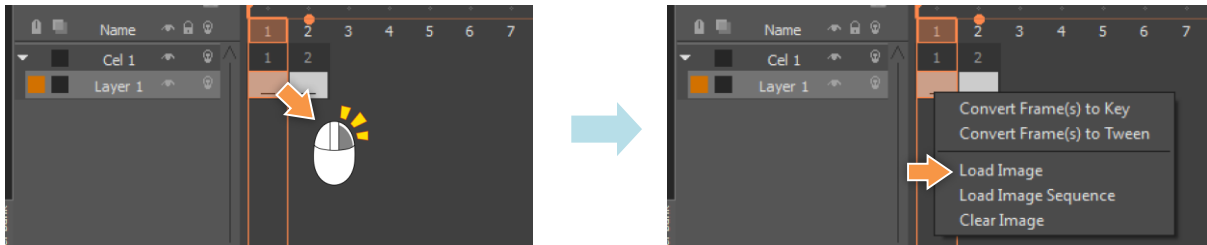


Loading Reference Images

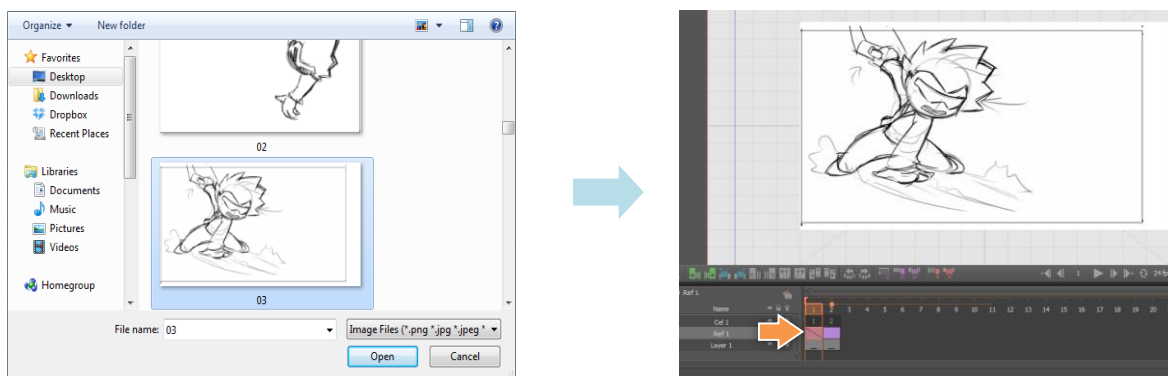
You can load images into reference layers in a few ways.

Loading a single image to the Reference Layer

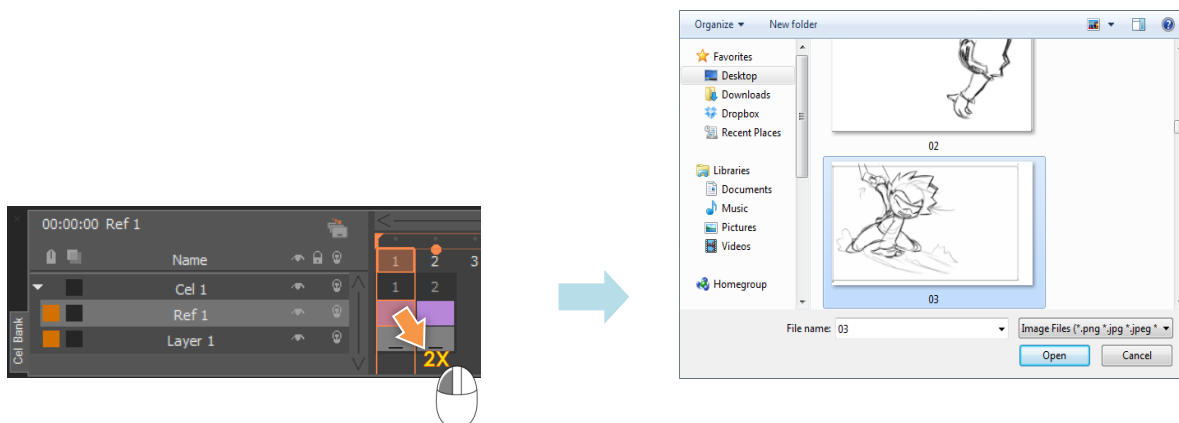
To load an image file as a reference image, **Right-Click** on any frame in the **Cel Bank**, then select **Load Image(s)** from the context menu.



Choose an image file from the File Explorer Dialog. A **new** Reference Layer will be created with the selected reference image in the same cel, indicated with a diagonal line over the reference sheet.



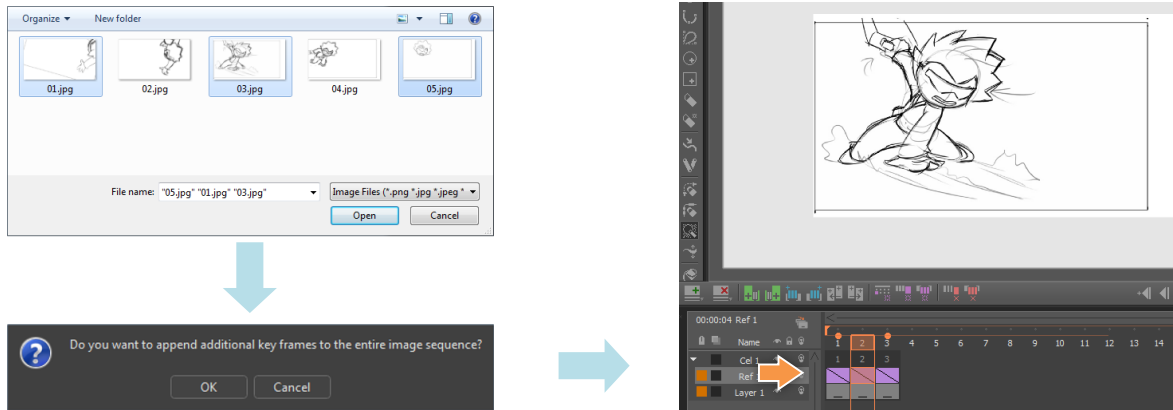
Alternatively, you can start by first creating the reference layer, then **Left-Clicking Twice** on a particular frame to bring up the image loading dialog window.



User Manual

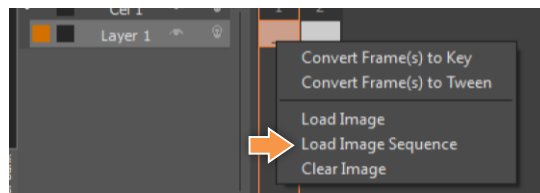
Loading multiple images to the Reference Layer

Using the same **Load Image(s)** option or **Left-Clicking Twice** on a reference layer frame, you can also select multiple, non-sequential image files to bring into the Cel Bank.

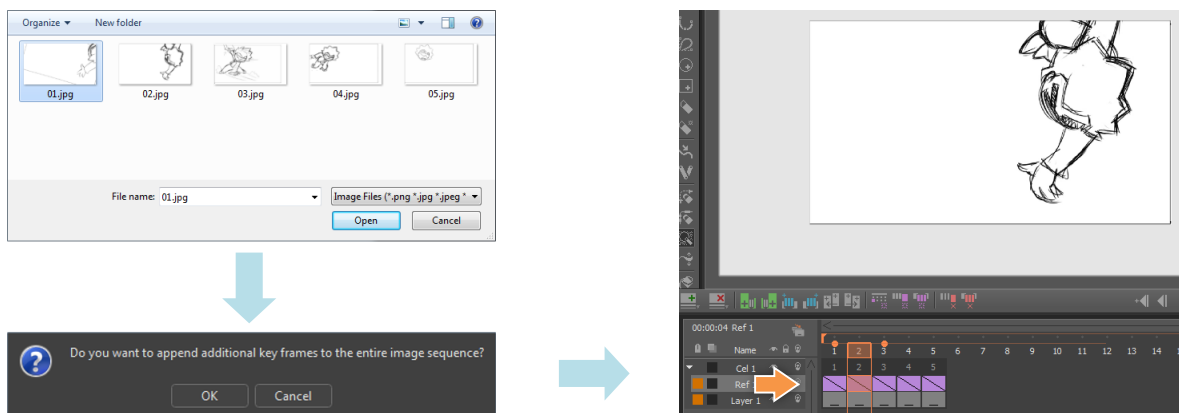


Loading an image sequence to the Reference Layer

Alternatively, you can select **Load Image Sequence** to load a series of pictures numbered sequentially into CACANi.



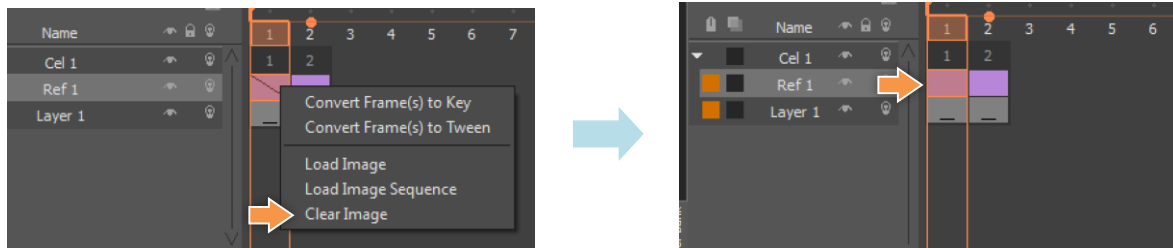
You only need to choose the first file for the sequence. CACANi will warn you that it will be increasing the number of created frames and possibly replacing images loaded previously. Click OK to continue.



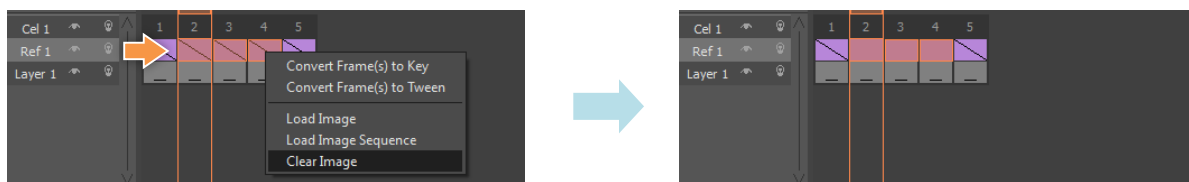
For the above to work correctly, all the files in the image sequence should have filenames that end with a numeric value (ie. file001, file002, file003.....).

Clearing reference images from the Reference Layer

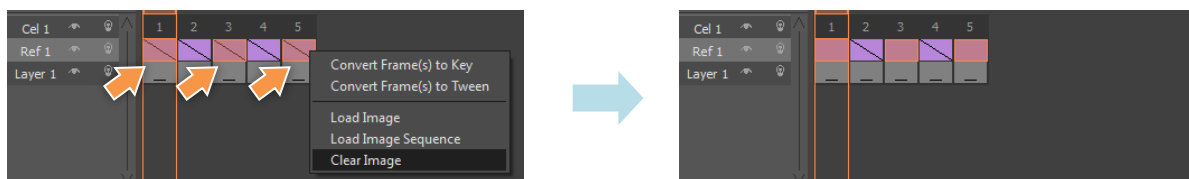
To clear a reference image, [Right-Click] on the frame in the **Cel Bank**, then select **Clear Image** from the context menu. The diagonal line indicator will disappear from the reference sheet as well.



To clear multiple reference images that are **arranged sequentially**, you can use **Drag + hold down Left Click** or **SHIFT + hold down Left Click** to first select the reference sheets, then **Right Click** and select **Clear Image(s)** from the context menu.



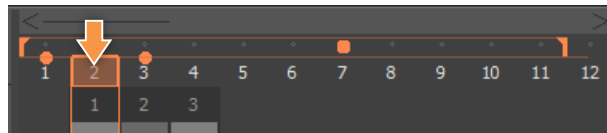
To clear multiple reference images that are **not arranged sequentially**, you can use **Ctrl + hold down Left Click** to first select the reference sheets, then **Right Click** and select **Clear Image(s)** from the context menu.



Frame View Interactions

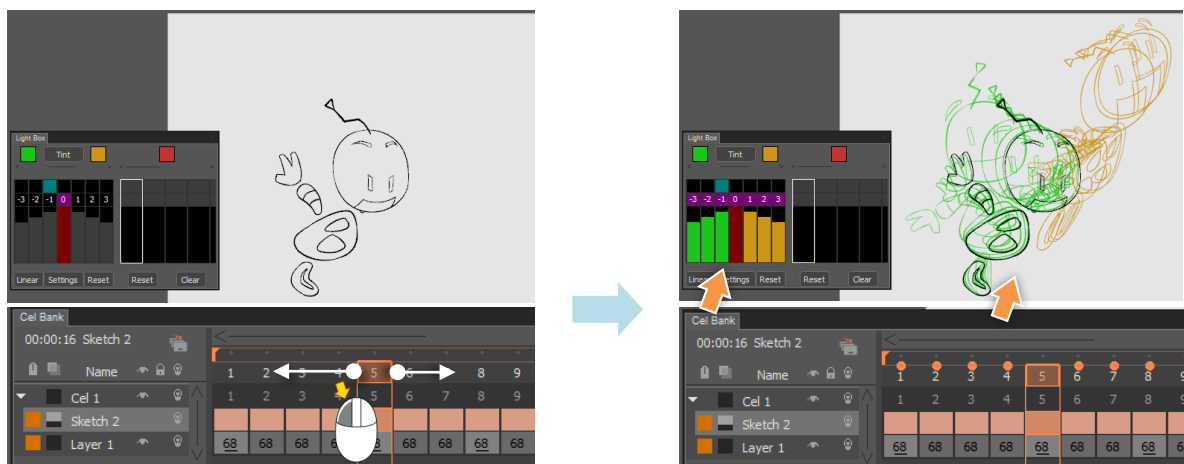
Using the Playhead

The playhead shows the location of the active frame. You can scrub through the animation sequence by Left Clicking and Dragging the **Middle** of the playhead. The active frame is displayed on the Canvas.



Displaying Onionskin Frames

In addition, the playhead can be used to display or hide onionskin frames. You can do that by Left Clicking and Dragging the **Edges** of the playhead. The orange dots indicates the onionskin frames displayed.



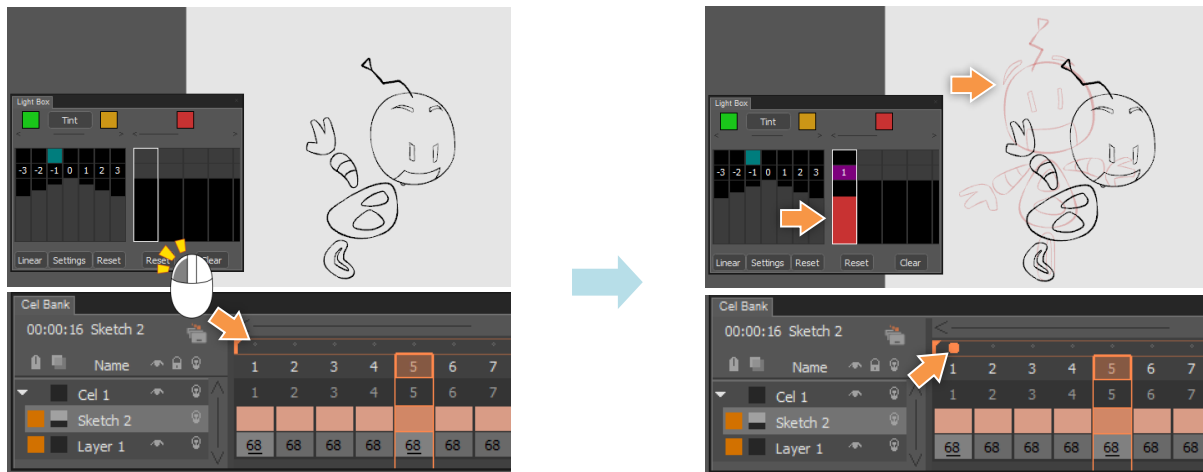
Left Click and Drag **AWAY** from the playhead to display onionskin frames.

Left Click and Drag **TOWARDS** the playhead to hide onionskin frames.

Displaying Offpeg Frames

The onionskin frames are relative to the playhead and active frame. When the playhead is moved, the onionskin frames are changed as well.

Offpeg frames are a different type of onionskin frames. They do not change when the playhead is moved. They can be activated by Left Clicking on the dots above the Frame Numbers in Frame View.



Offpeg Frames can be adjusted via the Offpeg Tool.

To deactivate the Offpeg Frame, Left Click on the dot again.

Setting the Playback Range

You can set a specific range to be played back with the 'In' and 'Out' range tabs. Left Click and Drag the 'In' range tab to the starting frame of your range, and the 'Out' range tab to the ending frame of your range.



Finally, enable the **Cycle Animation** checkbox to loop the playback.

Cel Timing Adjustments

You can move a cel (and the layers within) forwards or backwards in time so that different cels start / stop at different frames.



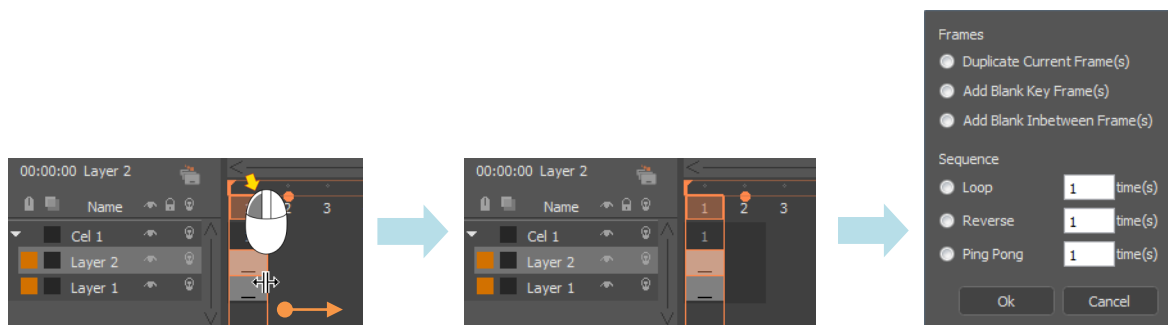
Maximising / Minimising a Cel

Cels can be minimized by **Left-Clicking Twice** on the cel frames in the cel bank frame view. You can maximise the cel again by **Left-Clicking Twice** on the cel frames.



Frame Creation Window

In Frame View, you can create frames via the Frame Creation dialog window. You can bring up this window by moving your cursor at the right end of a frame, or in the gutter between 2 frames. The cursor icon will change. **Left-Click** and **Drag** the cursor **to the right** and the window will pop up.

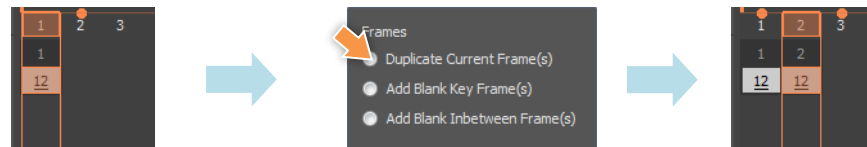


Frame Addition

The Frame Creation Window allows you to create different types of frame(s) or sequences.

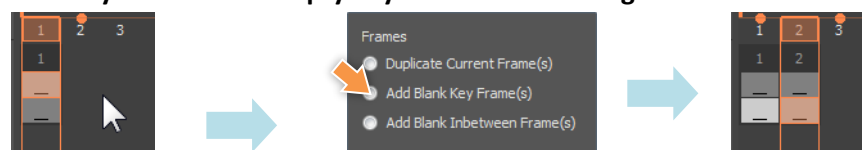
Duplicate Current Frame

Allows you to create a copy of your selected frames.



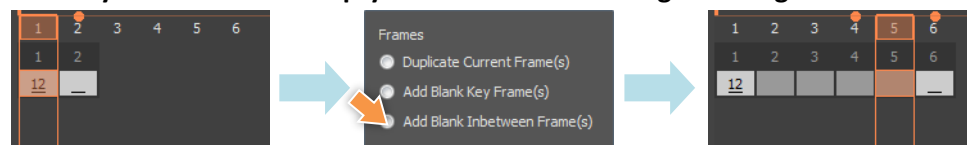
Add Blank Key Frame(s)

Allows you to create empty key frames for drawing.



Add Blank In-between Frame(s)

Allows you to create an empty in-between frame for generating in-betweens.

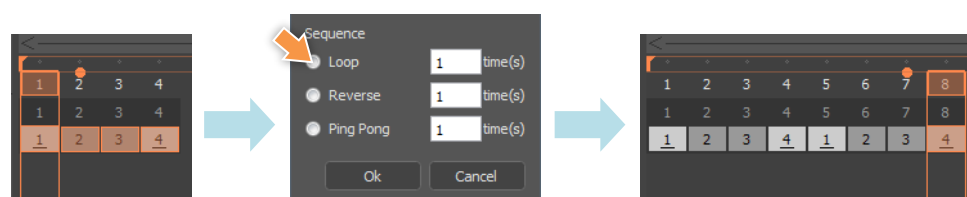


Sequence Looping

Other than adding frames, the Frame Creation Window also allows you to easily duplicate a sequence of frames. Instead of selecting a single frame, use **SHIFT + Left-Click** to select a series of frames. Enter a numeric value to determine how many times the sequence is duplicated.

Loop

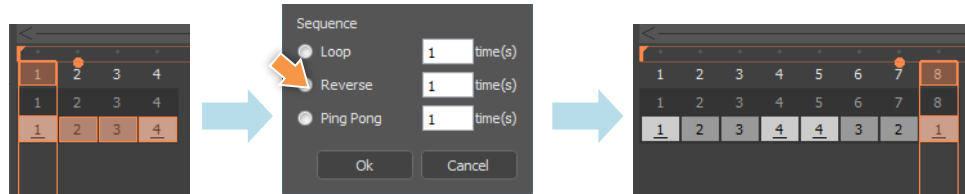
Allows you to duplicate the selected sequence, with the frames arranged in the same sequence.



User Manual

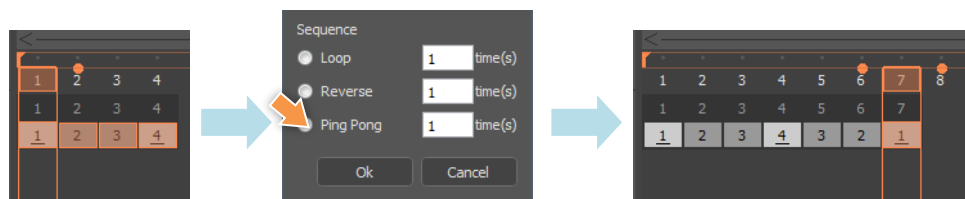
Reverse

Allows you to duplicate the selected sequence, but with the frames arranged in reverse order.



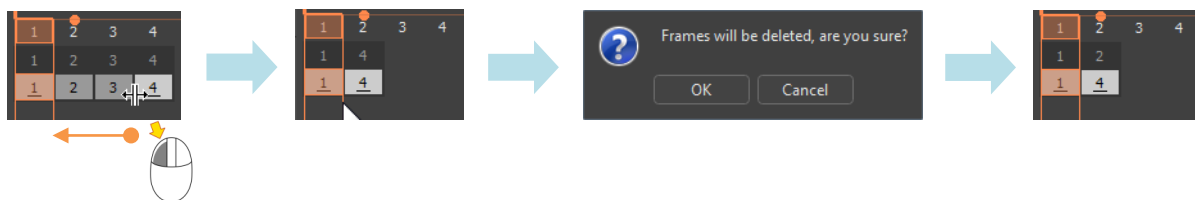
Ping Pong

Allows you to duplicate the selected sequence, but without duplicating the last frame, and with the rest of the frames arranged in reverse order.



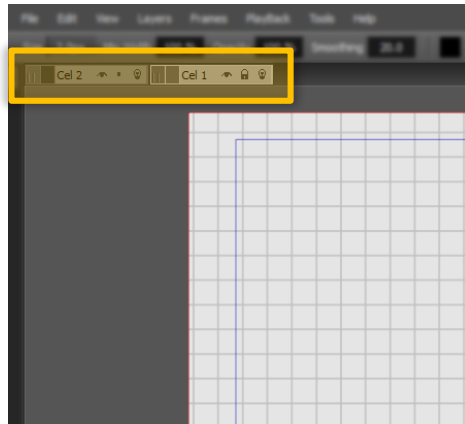
Frame Removal

To remove or delete frames, move your cursor at the right end of a frame, or in the gutter between 2 frames. The cursor icon will change. **Left-Click** and **Drag** the cursor **to the left** and a confirmation window will pop up. Click **OK** to complete.

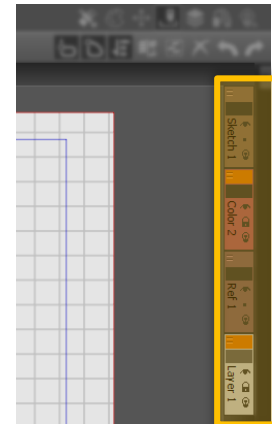


Cel and Layer Selection Bars

The Cel and Layer Selection Bars works with the same concept of frames, layers and cels, but just displayed in a different manner. You can use the **Cel Selection Bar** to select the cel you want to work on. When a cel has been selected, the layers within the cel will be displayed in the **Layer Selection Bar** on the right.

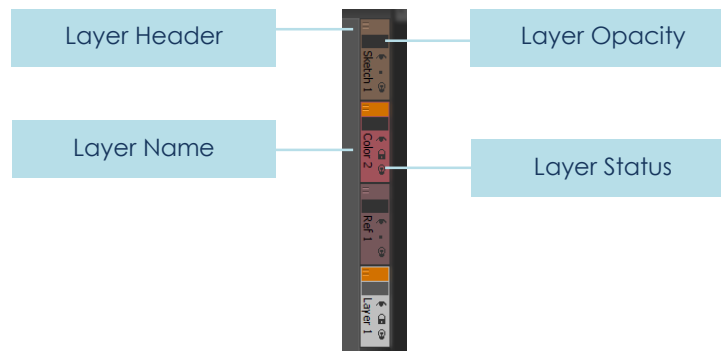


Cels



Layers

Layer / Cel Tabs



Layer Header

By **holding down Left-Click** and **Dragging**, you can reposition the specific layer and change the display order.

Layer Name

You can **Left-Click Twice** to rename the layer here. In addition, when there are too many tabs, by **holding down Left-Click** and **Dragging Up or Down** on this portion of the tab, you can scroll up and down the Layer Selection Bar.

Layer Opacity Slider

Similar to that in the Cel Bank, you can adjust the opacity level of the layer here.

Layer Status Icons

The layer status icons seen in the Cel Bank are also available here on the tabs.

In the Cel and Layer Selection Bars, you can Right-Click to access the context menu for adding and removing cels and layers.

Frame Controls



Frames can be easily created or removed using any of the **Frame Control** buttons located below the **Canvas**.



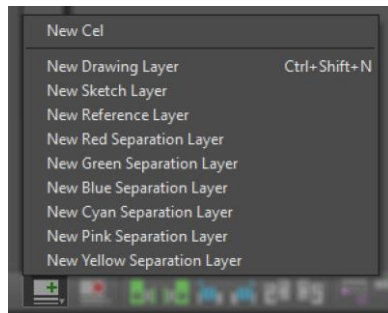
Cel Addition and Removal Buttons

Allows you to add or remove cels and layers in the Cel Bank.

Cel Addition Menu

This is another way to access the layer and cel creation functions.

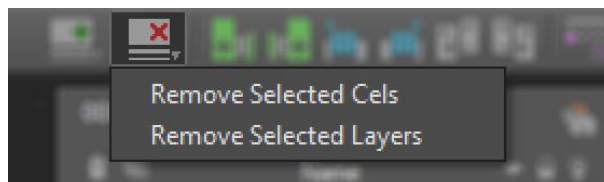
See [Chapter 07 - Layer / Cel Creation](#).



Cel Removal Menu

This is another way to remove layers and cels.

See [Chapter 07 - Layer / Cel Creation](#).



Frame Addition and Removal Buttons

Allows you to create/clear/delete frames without accessing the Cel Bank.



Add new Key Frames to the Left / Right

The first icon creates a key frame **before the active frame**, the second creates one **after the active frame**. This affects all layers in the same cel.



In-between Frames

The first icon creates an in-between frame **before the active frame**, the second creates one **after the active frame**. This affects all layers in the same cel.



Duplicate Frame

The first icon creates a duplicate frame **before the active frame**, the second creates one **after the active frame**. This affects all layers in the same cel.



Clear Sheet

Allows you to clear the strokes in the active sheet.



Clear Frame

Allows you to clear, or empty, all strokes in the active frame. This affects all the layers in the same cel.



Clear In-between Frames

Allows you to clear all strokes in the in-between frame sequence. This affects all in-between frames within the same pair of key frames, as well as all the layers in the same cel.



Delete Frame

Allows you to remove the active frame from the cel sequence. This affects all the layers within the same cel.



Delete In-between Frames

Allows you to remove all in-between frames within a pair of key frames. This affects all the layers in the same cel.

Deleting and clearing of selected frames can also be done en-mass to a group of selected frames.

Multiple frames can be selected either with [**Ctrl + Left Click**] to select different frames or [**SHIFT + Left Click**] to select a range of frames.

08

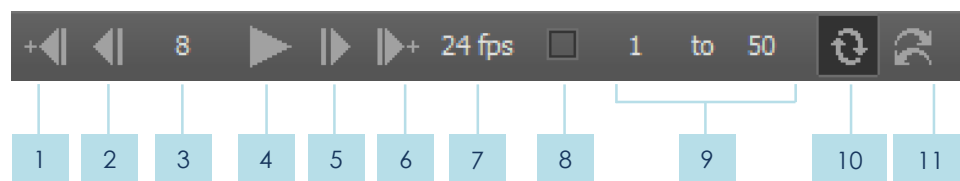
Animating & In-betweening

Your Own Animation Assistant

CACANi has been designed to harness the power of the computer in the hand-drawn animation workflow. With information from the key frames, in-between frames can be automatically generated and painted. At the same time, the artists retain full control of the process, by being able to adjust the frames as and when they need.

Playback Bar

When animating, it is important to preview the sequence constantly. Only by looking at the drawings in motion, will you be able to tell if the drawings are properly animated, or require further tweaking and adjustments.



- 1 Go to Previous Key frame**
Moves the Playhead to the previous key frame.
- 2 Go to Previous Frame**
Moves the Playhead to the previous frame.
- 3 Current Frame / Time**
Displays the current active frame or time. In addition, you can scrub through the frames by left click and dragging on the frame number. Dragging right will move the playhead forward, while dragging left will move it backwards.
- 4 Play / Stop**
Perform playback for the animation sequence. Click again to stop the playback.
- 5 Go to Next Frame**
Moves the Playhead to the next frame.
- 6 Go to Next Key frame**
Moves the Playhead to the next key frame.
- 7 Frame Rate**
Sets the rate at which the sequence is played back. Click and drag on the number to change the frame rate during playback, or click on the number to key in a new frame rate. A negative frame rate will reverse the playback of the sequence.
- 8 Playback Range Toggle**
When enabled, you can select the range of frames to playback.

9 Range In and Range Out Frames Input

Allows you to set the starting frame and the ending frame of the playback range. The frame numbers also correspond to the Range In and Range Out Tabs in the Timeline.

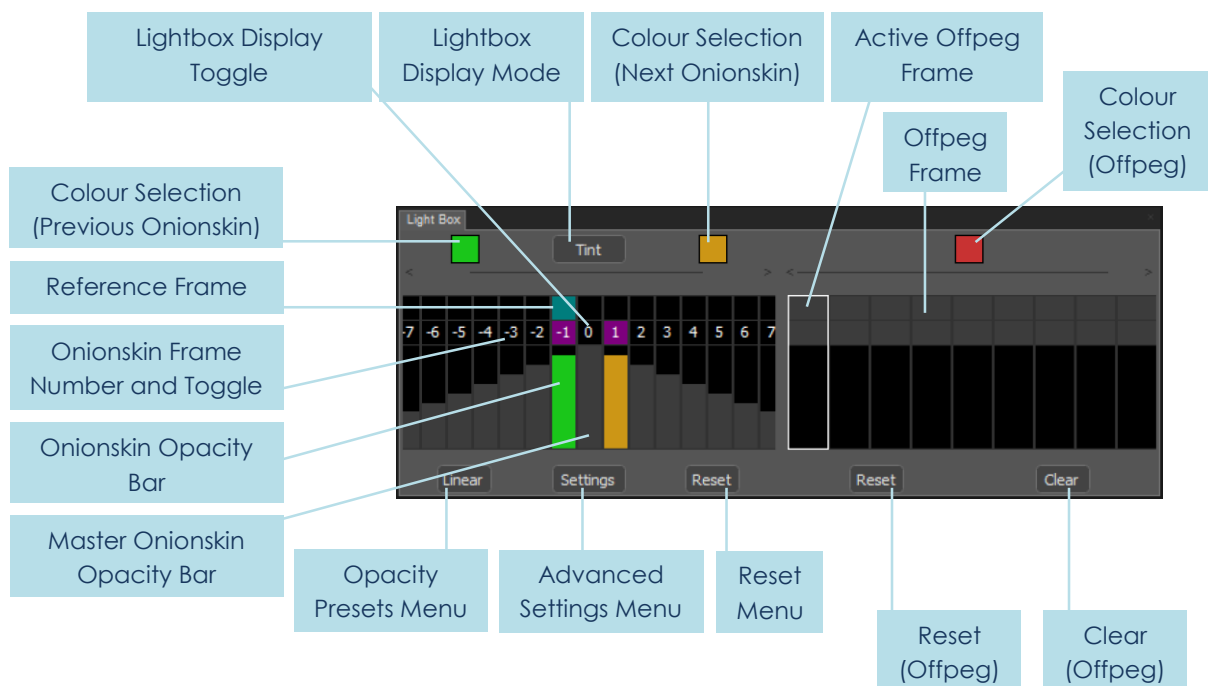
Cycle Animation modes

10 In Continuous mode, after the playback reaches the end of the animation sequence, it loops back to the first frame.

11 In Ping Pong mode, after the playback reaches the end of the animation sequence, the sequence is played in reverse.

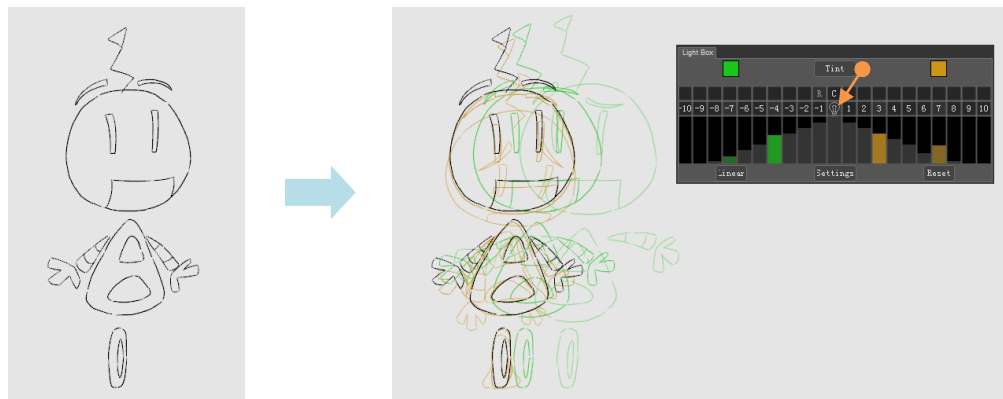
Lightbox Panel

The **Lightbox Panel** is used for referencing other frames when drawing for better accuracy in drawing.

**Lightbox Display Toggle**

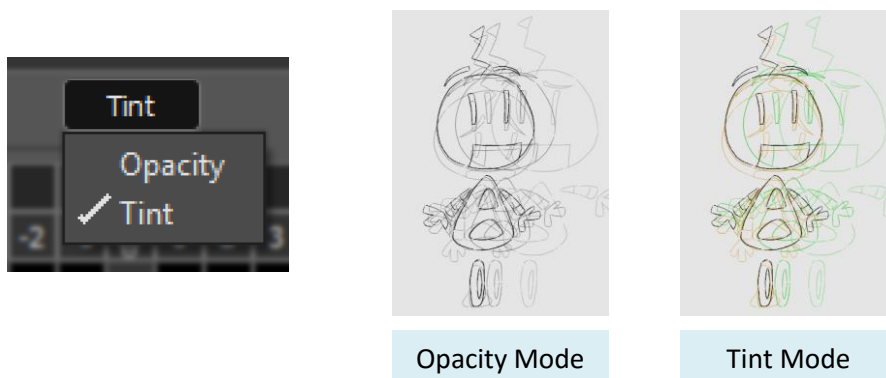
Allows you to toggle on or off the onionskin images.

To enable / disable onionskin images, click on the **Lightbox Display Toggle** on the **Lightbox Panel**. Alternatively, the Lightbox Display Toggle can also be found in the **Display Property Bar**.



Lightbox Display Mode

Allows you to change between **Tint** and **Opacity** display modes. Opacity mode also preserves the original colours of the images.

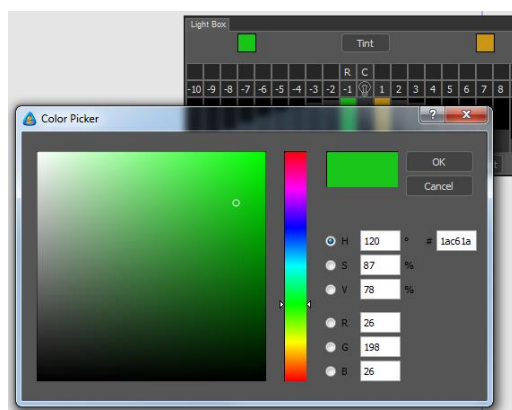


Colour Selection (Previous Onionskin)

Allows you to change the colour of onionskin images before the active frame. To do so, double click on the colour selection box and a colour selection dialog will appear.

By default, onionskin images before the currently selected frame will be coloured **green**, those after the selected frame (**8**) will be coloured **ochre brown**.

It is possible to change the colours of the onionskin images by double clicking on the colour selection boxes. This will trigger a dialog for onionskin image colour changes.



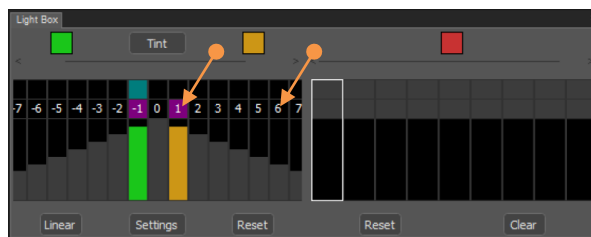
Reference Frame

Allows you to designate a frame for stroke matching. Because matching strokes are normally confined to adjacent key frames, this will allow you to **match strokes to non-adjacent frames**.

The Reference Frame is viewed as an onionskin image, either on the canvas or in the **Navigator Panel**, when **Reference Frame mode** is enabled.

Onionskin Frame Number and Toggle

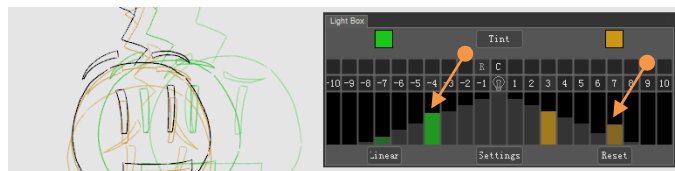
Indicates the frame number relative to the active frame. Clicking on the number also toggles on the onionskin image. When toggled on, the opacity bar will be shown in colour.



Onionskin Opacity Bar

Allows you to change the opacity value of the onionskin image displayed on the canvas.

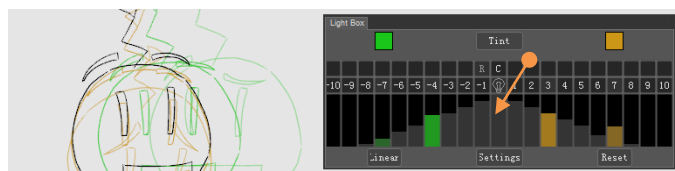
Onionskin images further away from the selected frame will have lower opacity values by default, thus giving an appearance of fading away. The opacity values of the onionskin images can be changed by adjusting the onionskin opacity bars corresponding to the onionskin images.



Master Onionskin Opacity Bar

Determines the maximum opacity value of the onionskin images.

Alternatively, the maximum opacity can also be changed by adjusting the Master Onionskin Opacity Bar.

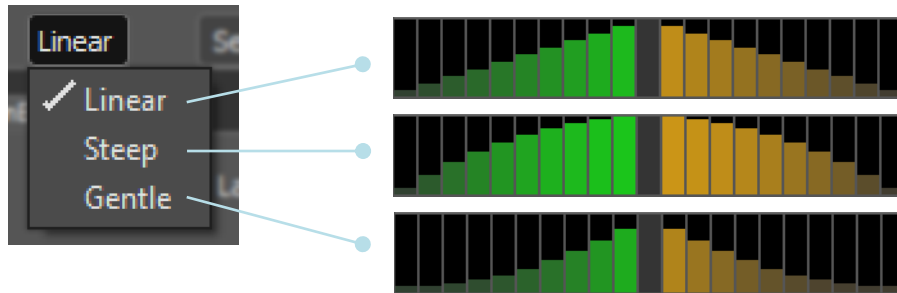


Colour Selection (Next Onionskin)

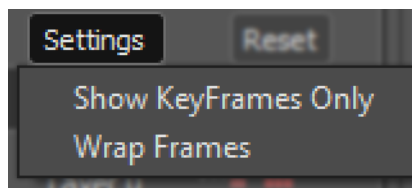
Allows you to change the colour of onionskin images after the active frame. To do so, double click on the colour selection box and a colour selection dialog will appear.

Opacity Presets menu

A list of presets that changes how fast the opacity values of the onionskin images fades.



Advanced Settings menu

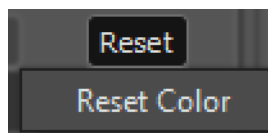


When **Show Key frames Only** is enabled, the onionskin images will only reflect the key frames, and skip the in-between frames.

When the currently selected frame is the last frame of the sequence, enabling **Wrap Frames** will allow you to see the onionskin image of the first frame.

Reset menu

Changes the colours of the onionskin images back to the default colours.



Active Offpeg Frame

Current Selected Offpeg Frame.

Offpeg Frame

Offpeg frame bars. Activated when an offpeg frame is toggled in the Cel Bank.

Colour Selection (Offpeg)

Allows you to change the colour of the offpeg frames.

Reset (Offpeg)

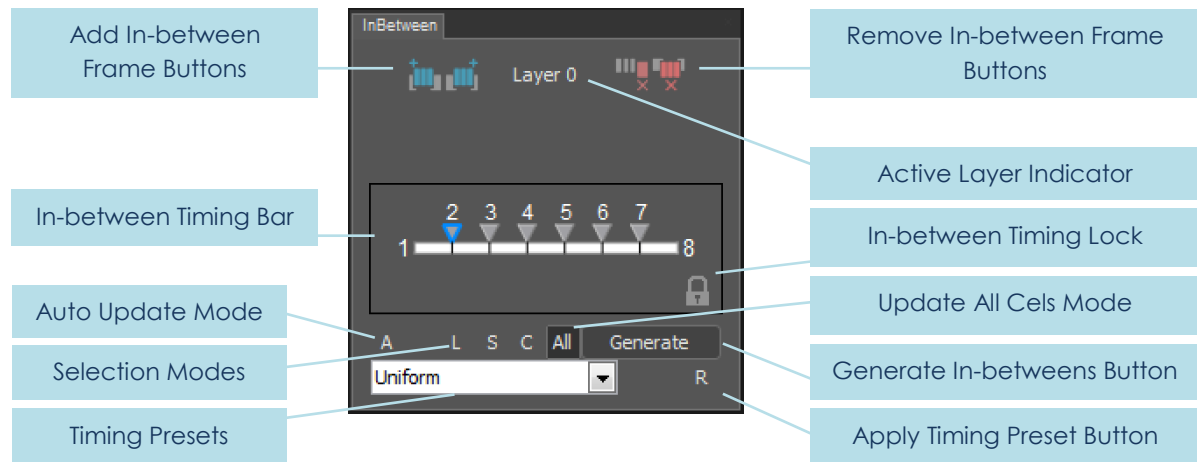
Changes the scaling, position and rotation values of the active offpeg frame back to its original values.

Clear (Offpeg)

Removes the active offpeg frame.

Timing Panel

In-between generation is one of the key functions in CACANi. Given two key frames depicting extreme poses of an action, intermediate frames, aka in-betweens, can be automatically generated by CACANi, creating a smooth motion. The **Timing Panel** provides flexible control of in-between frame generation.



Add In-between Frame buttons

Transition frames that are generated based on the key frames. Information between matching strokes in a pair of key frames is used to create in-between frames. The first icon creates an in-between frame **before the active frame**, the second creates one **after the active frame**. This affects all layers in the same cel.

In-between Timing Bar

Shows the timing of in-between frames in the current pair of key frames. By adjusting the position of the notches, it will allow you to change the speed of animation for the in-between frames.

Auto Update Mode

When enabled, in-between frames will be updated instantly whenever the timing is adjusted. However, this applies only to in-between frames that have been generated already, and does not apply to blank in-between frames.

Selection Modes

Allows you to select which layers or cels are affected by the timing adjustments.

Selected Layers

When enabled, only selected layers are affected by the timing adjustments.

All Layers in Cel

When enabled, all the layers in the active cel are affected by the timing adjustments.

All Cels

When enabled, all cels with similar timing and frame types are affected by the timing adjustments.

Timing Presets

Provides you with a number of frequently used settings for quick timing adjustments. Click on the **Timing Preset Button** to update the **In-between Timing Bar** with the selected presets.

Uniform

In-between frame markers are spaced the same distance from each other. The motion between key frames will be at a constant speed.

Accelerate

In-between frame markers are spaced closer together as they approach the second key frame. The motion between key frames will be speeding up.

Decelerate

In-between frame markers are spaced further apart as they approach the second key frame. The motion between key frames will be slowing down.

Accelerate -> Decelerate

The spacing between in-between frame markers is further apart in the middle, and closer together when they approach the key frames on either side. The motion between key frames will be slowing down, then speeding up.

Decelerate -> Accelerate

The spacing between in-between frame markers is closer together in the middle, and further apart when they approach the key frames on either side. The motion between key frames will be speeding up, then slowing down.

Remove In-between Frame buttons

The first icon allows you to remove the active in-between frame from the cel sequence. The second allows you to remove all in-between frames within a pair of key frames. This affects all the layers in the same cel.

Active Layer Indicator

Shows the current selected layer.

In-between Timing Lock

When enabled, the active in-between frame will be prevented from any changes or updating due to timing adjustments in the **Timing Panel**. However, you will still be able to manually adjust the strokes of the locked frame directly on the canvas.

Update All Cels Mode

When enabled, all cels are affected by the timing adjustments. However, this only applies to cels which have the same number of frames and frame type.

Generate In-betweens button

When clicked, it will generate in-between frames based on the settings in the **In-between Timing Bar**.

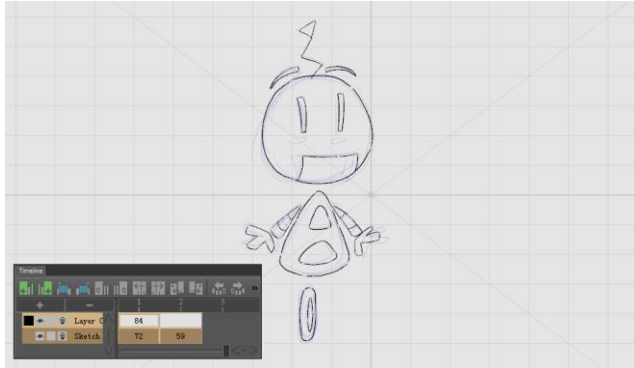
Apply Timing Preset button

When clicked, any prior adjustments to the In-between Timing Bar will be cleared and the markers will be moved based on the **Timing Presets**. However, this does not alter the actual in-between frames. The frames will only be changed to the new timing if the **Generate In-betweens button** is clicked again, or if the **Auto Update Mode** is enabled.

Using the In-betweening Panel

1. Create the 1st key frame

Start by creating your first drawing in key frame 1.

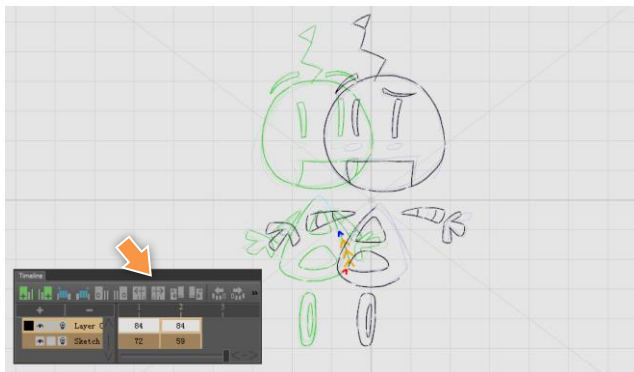


2. Switch on the Lightbox in the Display Bar



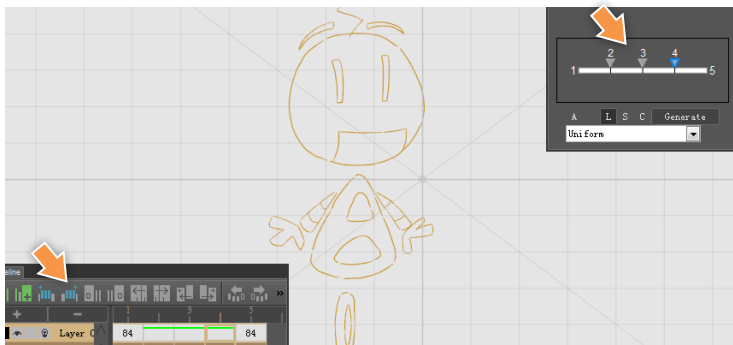
3. Create the 2nd key frame

Draw the second drawing in key frame 2, while taking note of the stroke matching arrow indicators in key frame 1.



4. Create Blank In-between Frames

Decide the number of in-between frames needed between the pair of key frames.



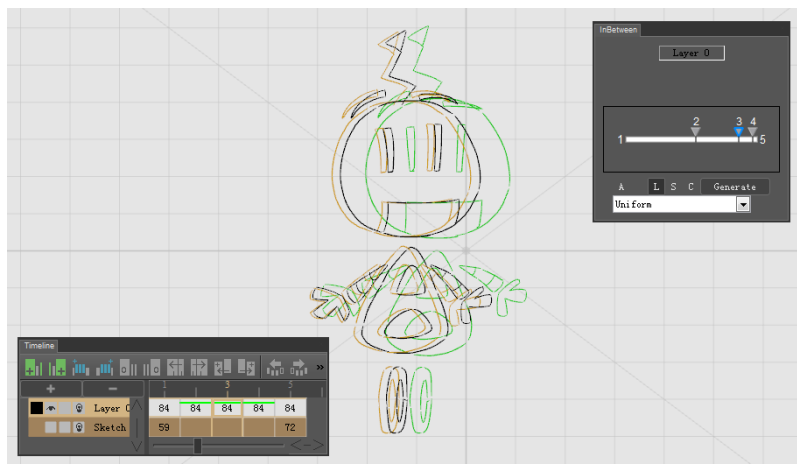
5. Adjust Timing for In-between Frames

By default, the in-between frames have equal timing, hence the speed of the animation will be constant. However, movements in real life have irregular speeds. When the frame markers are nearer, the animation will speed up. When they are further apart, the animation will slow down. In this case, the animation is adjusted such that the movement speeds up.



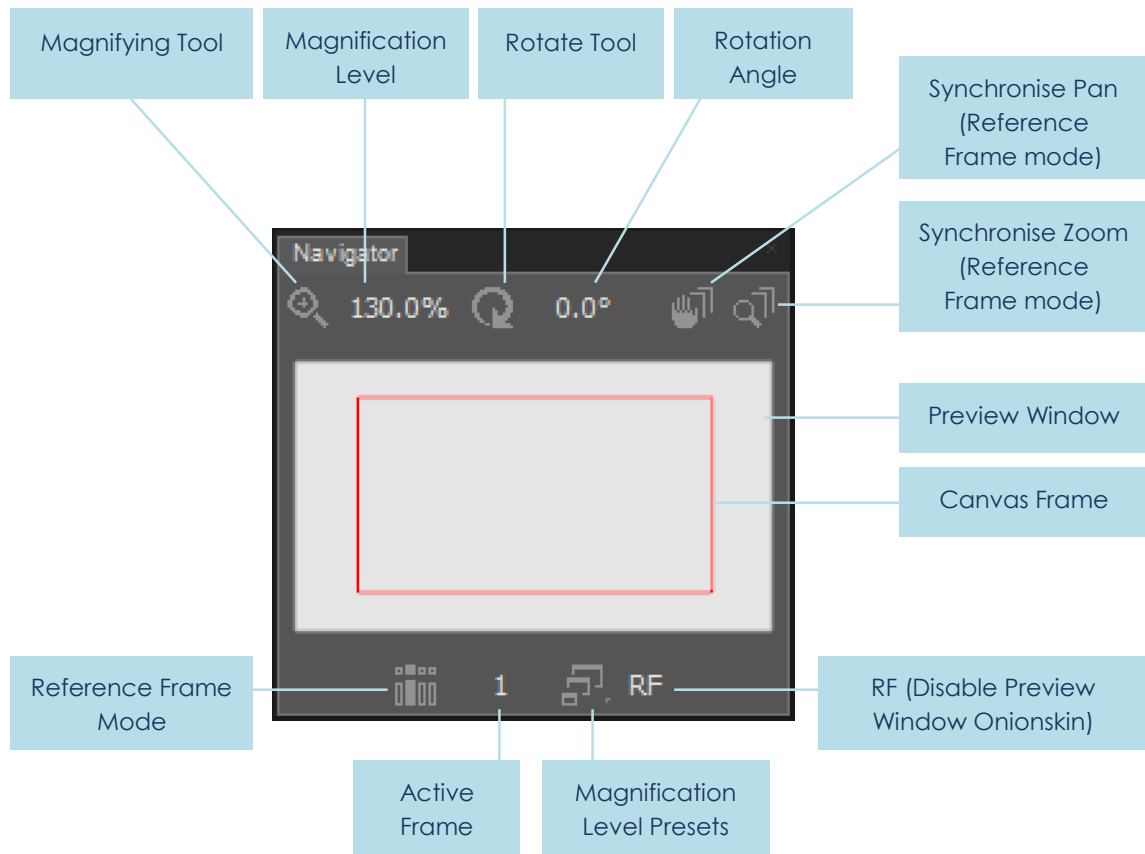
6. Generate In-between Frames

After the timing is adjusted, click on the **Generate** button. In-between frames will now be created. In the example below, we can see the onionskin images of the in-between frames. Note that the spacing between them is not constant, which is a result of our timing adjustments earlier.



Navigator Panel

The Navigator Panel provides a secondary view of your canvas, allowing you to pan, scale and rotate around the canvas. Another important feature of the Navigator, is that it can be used to display the Reference Frame, thus providing you with a way to match strokes without displaying everything in the canvas.



Magnifying Tool

Allows you to zoom in and out of the canvas. Left Click and Drag **right** to zoom into the canvas, Drag **left** to zoom out of the canvas.

Magnification Level

Allows you to key in the precise percentage of magnification. Left Click on the number to input any value from 1.6% to 6400%.

Rotate Tool

Allows you to rotate the canvas for easier drawing of strokes. Left Click and Drag **right** to rotate the canvas clockwise, Drag **left** to rotate anti-clockwise.

Rotation Angle

Allows you to key in the precise degree of rotation. Left Click on the number to input any value from -180° to 180°.

Synchronise Pan (Reference Frame mode)

When enabled in Reference Frame mode, panning in the preview window will affect the canvas as well.

Synchronise Zoom (Reference Frame mode)

When enabled in Reference Frame mode, zooming in and out in the preview window will affect the canvas as well.

Preview Window

Shows you a thumbnail view of the canvas.

Canvas Frame

Also allows you to pan the canvas. Left Click and Drag with the red frame to re-position the canvas window.

Reference Frame Mode

When enabled, the Reference Frame will be displayed in the preview window. This allows you to view and match strokes without the Reference Frame cluttering up the canvas.

Active Frame

Displays the active frame number.

Magnification Level Presets

Allows you to select preset values of the magnification level of the canvas.

RF (Disable Preview Window Onionskin)

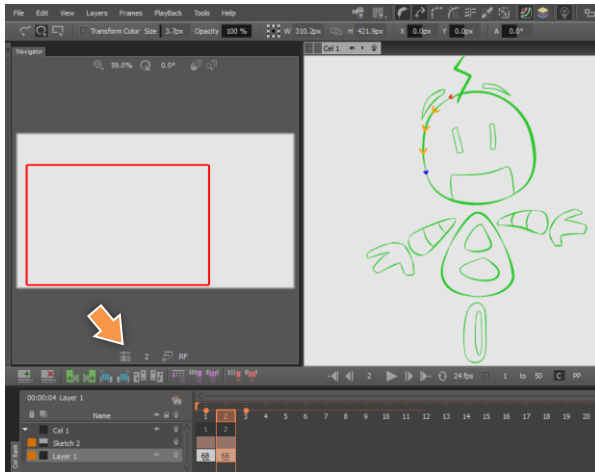
When enabled, no onionskin frame will be displayed in the preview window.

Using the Navigator Panel – Canvas Navigation

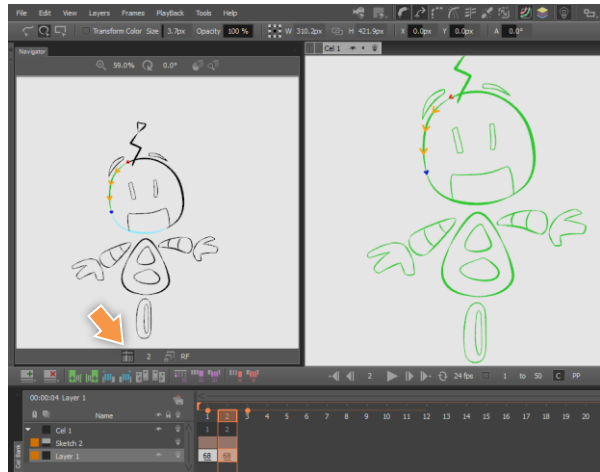
Please refer to [Chapter 02 – Canvas Navigation](#).

Using the Navigator Panel – Reference Frame Mode

In this mode, the Navigator allows you to view a frame that has been designated as a Reference Frame. As CACANI's in-betweening system works by corresponding strokes in a pair of key frames, a Reference Frame refers to the key frame used for stroke matching in the current or active frame.

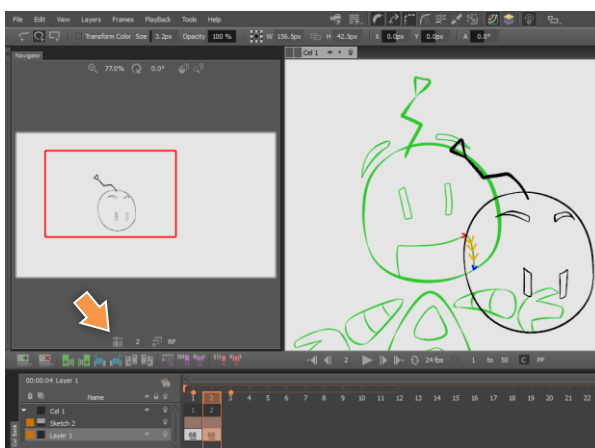


Navigator Normal Mode



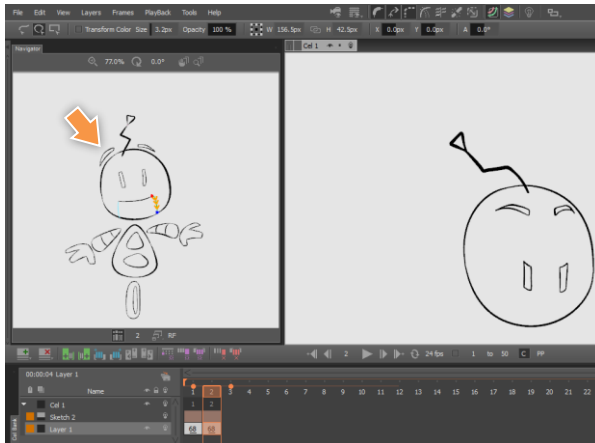
Navigator Reference Frame Mode

This helps you to separate the strokes in the Reference Frame from the strokes you need to draw in the active frame. This is especially useful when the drawings are very complex.

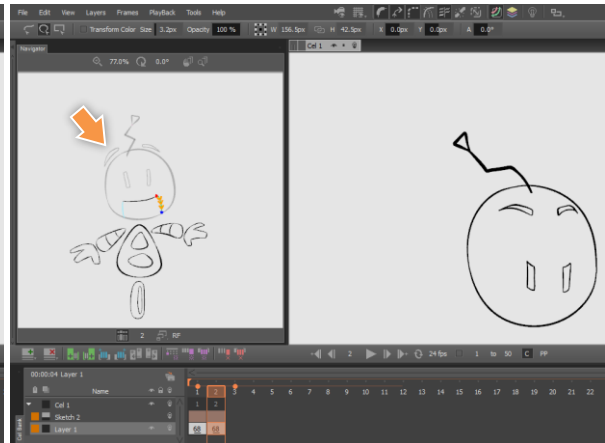
Lightbox enabled,
Navigator Normal ModeLightbox disabled,
Navigator Reference Frame Mode

Grey Out Matched Strokes Display Mode

In conjunction with the Reference Frame Mode, this helps you to identify the remaining strokes to match. When enabled, strokes that are already matched or corresponded will be displayed as grey strokes, instead of the strokes' original colour.



Matched Strokes (head) are still displayed as black strokes



Matched Strokes are displayed as grey strokes



Using the Feature Point Tool

When generating strokes from a key frame, there are times when you will require the stroke to deform in a specific way. For example, when drawing smoke animation, the 'bump' in a stroke should move through the stroke. That can be achieved with the Feature Point Tool.

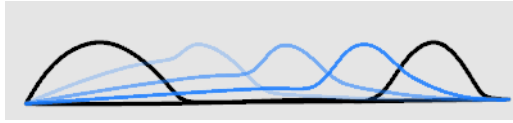
As an example, we have 2 key frames below, drawn with only 1 stroke:



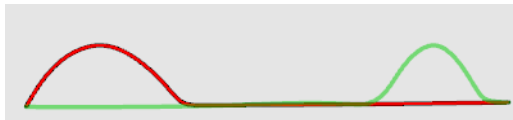
The generated in-between frames (in red) will look like this:



To create an effect where the 'bump' moves through the stroke, the in-between frames will look like this:



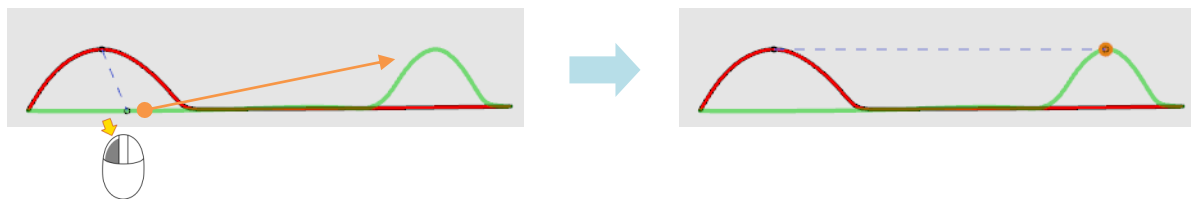
To do so, use the Feature Point Tool to select the stroke in the first key frame. The second key frame is highlighted in green.



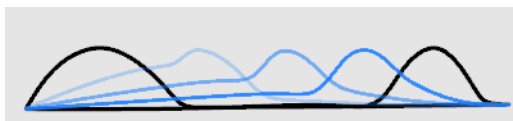
Right-Click at the highest point of the 'bump' to bring up the context menu and select **Add a Feature Point**. A dashed path will appear, leading from the first key frame and ending on the second key frame. This indicates how the stroke moves at that point.



Move the ending point of the path to the bump on the second key frame.



Generate the in-between frames this time will give you the following result.



You can also adjust the path to modify the generation of the in-between strokes.



Stroke Groups

Stroke Grouping allows you to manipulate multiple strokes at the same time. In addition, the **Bone Tool** will only work with groups, not individual strokes.

Enabling **Auto Group mode** will cause each stroke to be grouped individually, so that bones can be created for each stroke.

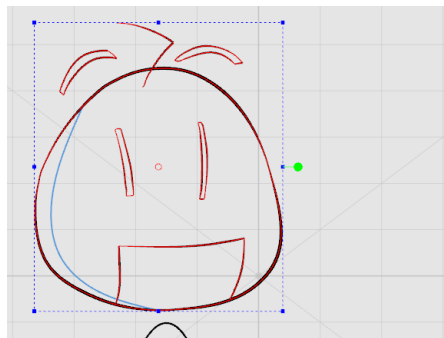
Strokes can be grouped in any type of frames.

How to Group and Ungroup Strokes

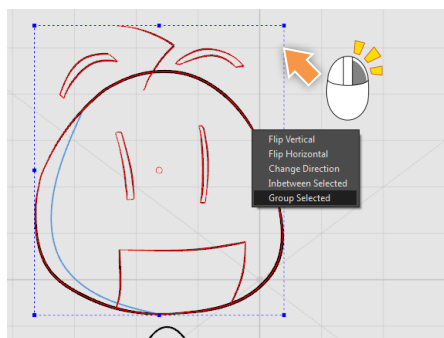
1. Stroke grouping can be done with the **Selection tool**.



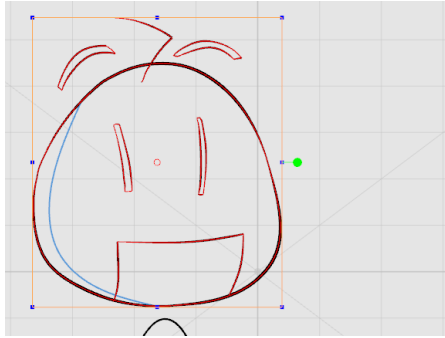
2. Select the strokes on the canvas. Take note that you can only group strokes on the same layer.



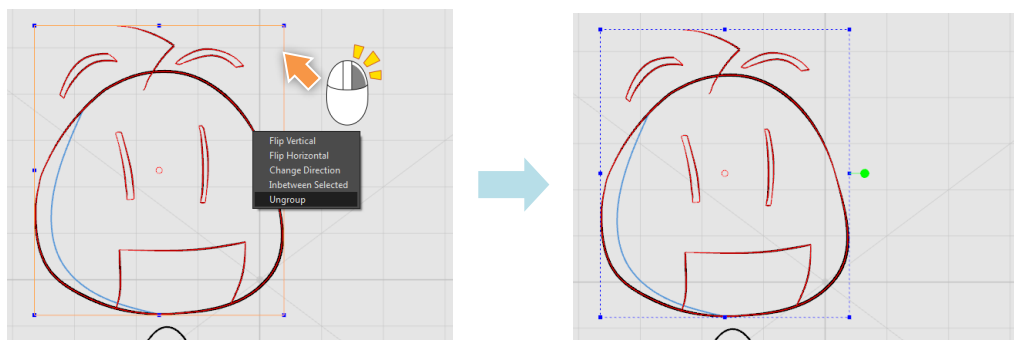
3. **Right-Click** while hovering over any of the selected strokes. From the context menu, choose **Group Selected**. If the option does not appear in the context menu, it could be because you have selected strokes from multiple layers.



4. Strokes will now be grouped. The selection box is now orange.



5. To ungroup, Right-Click while the group is selected. Choose **Ungroup** from the context menu.

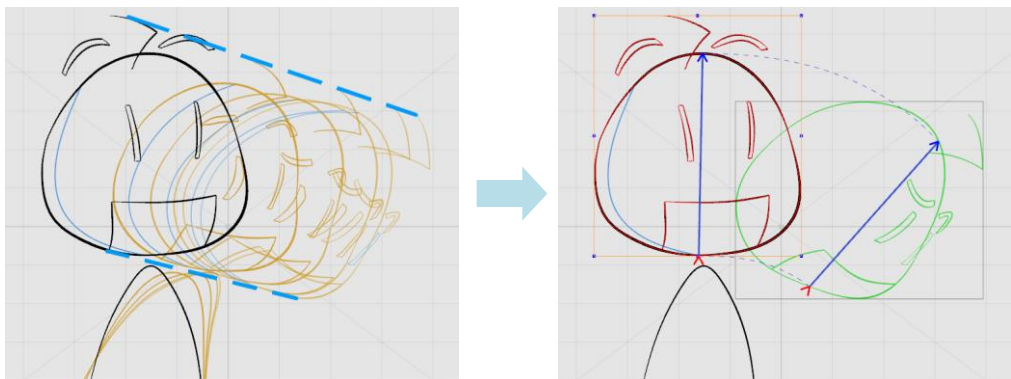


Bone Tool

By default, the automatic generation of in-betweens is set to straight in-betweens. However, artists frequently utilise motion arcs for more natural animations. The extent of motion arcs can vary from animation to animation, and indeed, a single character usually has body parts moving with multiple motion arcs.

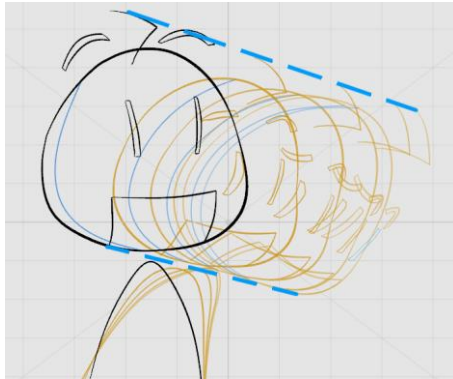
The **Bone Tool** allows you a further level of optimisation and control in the generation of in-betweens. By specifying the motion arcs, in-betweens can be adjusted for more accurate animation.

The Bone Tool can only be created and adjusted **from groups in key frames**.

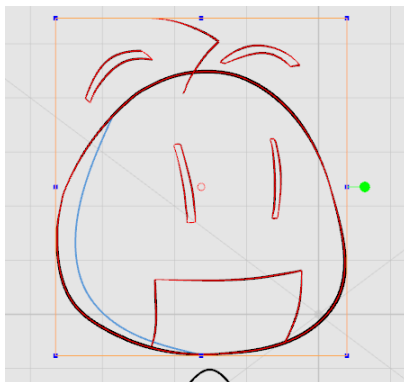


Using the Bone Tool

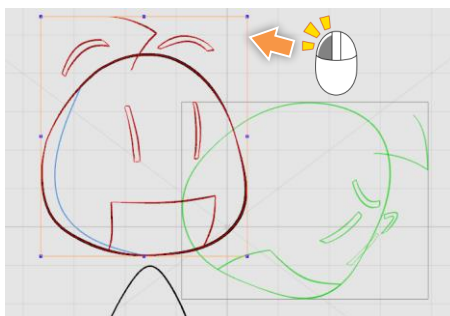
1. In this example, the character is turning his head. But the default generated in-betweens make the animation very robotic. The head should be moving in an arc, not a straight line.



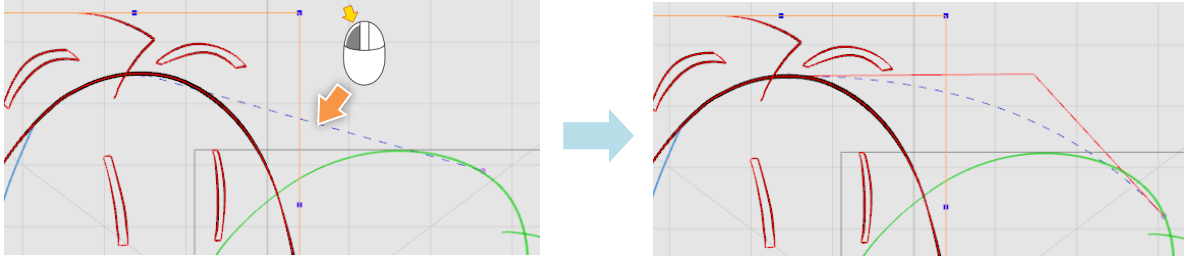
2. Begin by selecting the strokes for the head with the **Selection tool**, then right clicking to group them. This is required as the **Bone Tool** is only usable in groups.



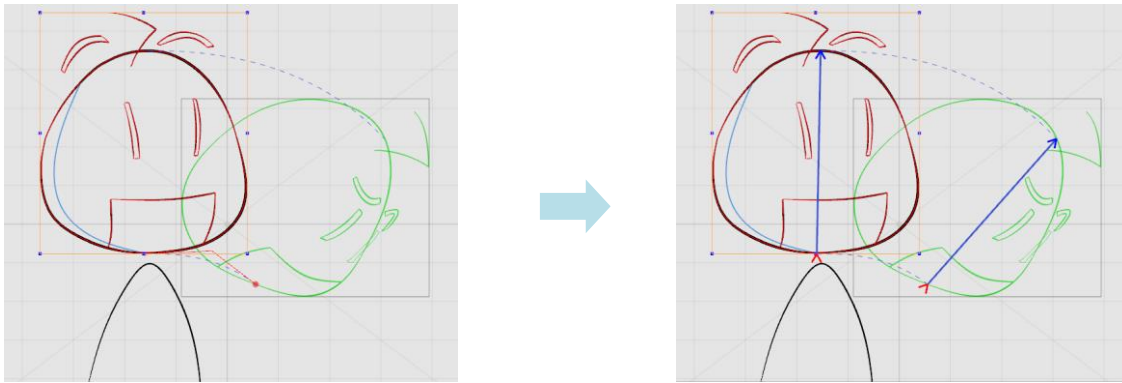
3. After creating a group, select the **Bone Tool**. Click on the strokes in the group. A bounding box will appear around the strokes. At the same time, a second bounding box showing the same strokes in the next frame will be displayed in green.



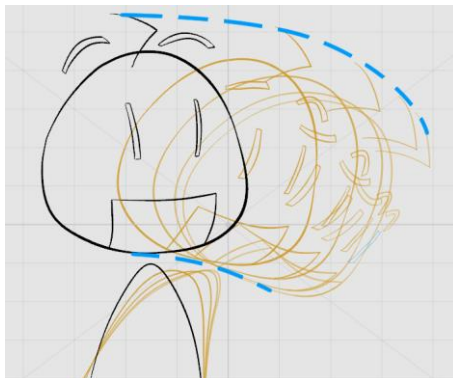
4. With the group still selected, start the first motion arc by left clicking somewhere near the top of the bounding box and dragging a straight line to a similar area in the second bounding box. Upon release of the mouse, adjust the motion arc by moving your mouse while hovering. Left click again to confirm the arc.



5. The second motion arc is drawn in the same way. For better results, it's recommended to place the second arc near to the bottom of the bounding box.



6. With that, the in-between frames can now be generated via the **Timing Panel**. Compared to the original in-between frames, the new ones now move according to the motion arcs described by the artist.

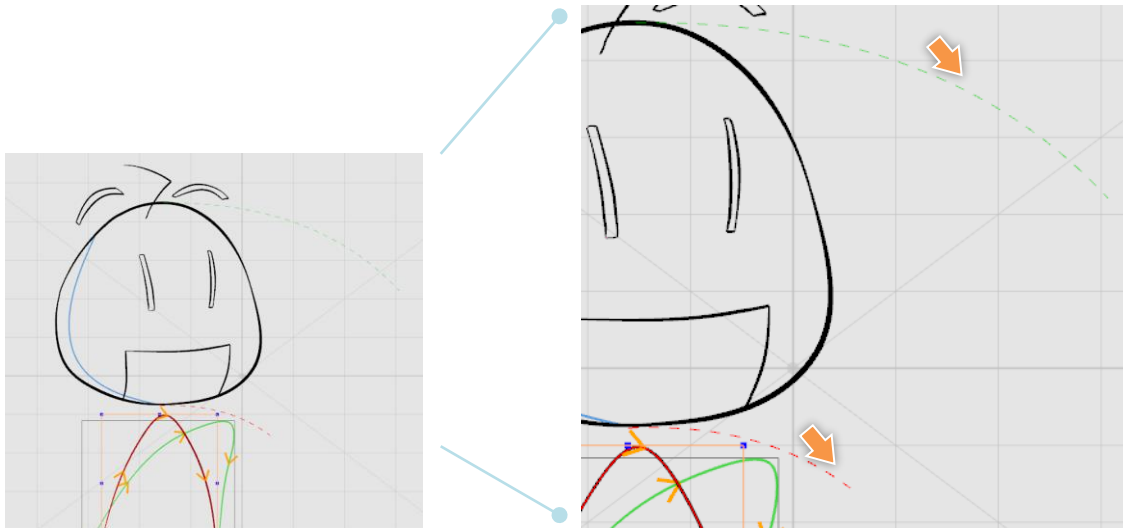


Bones can only be created on key frames, and will only affect the in-between frames within a pair of key frames. As such, separate bones and motion arcs will have to be created for the next pair of key frames.

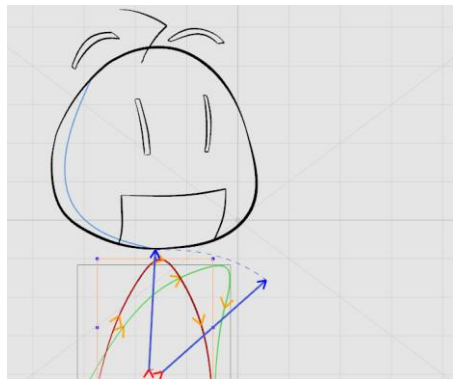
Synchronising Multiple Bones

When multiple groups are created, each can have a set of bones. In this case, it's important to synchronise the movement of the bones.

In this example, the body and head are in different groups. To synchronise the body's bone movement to the head, select the body group with the **Bone Tool** and press **Ctrl**. All the motion paths will be highlighted.

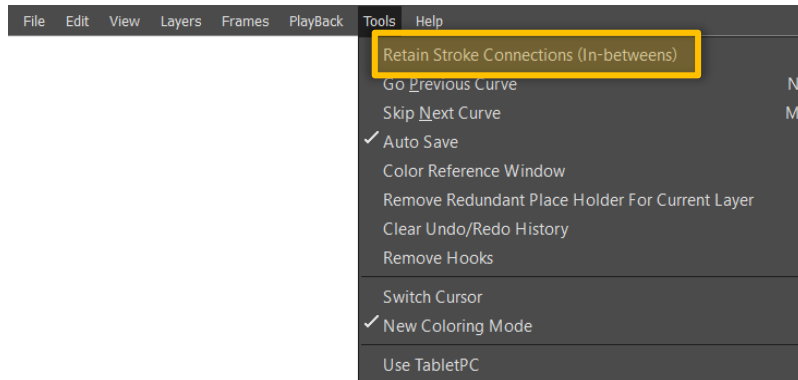


Left Click on the highlighted motion path to synchronise the body group with the head group. Create the second motion path near the bottom of the body. The body group is now synchronised with the head group.



Retain Stroke Connections

The **Retain Stroke Connections** function is a tool to help minimize unwanted stroke gaps in generated in-between frames. This will make it easier for artists to paint the in-between frames at a later stage. The function can be found in the **Menu Bar**, under the **Tools** menu.



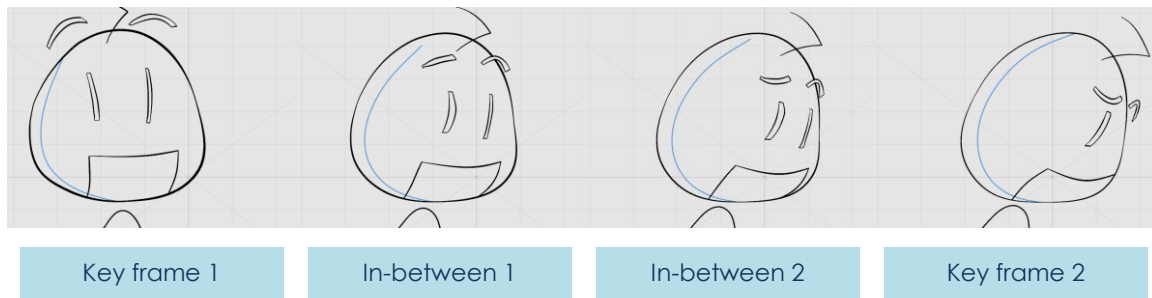
When an end of a curve falls on another curve, they form a T intersection as shown in the figure below.



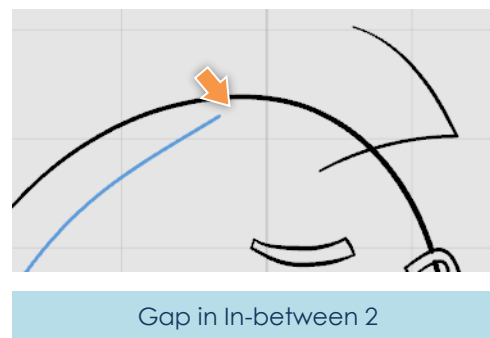
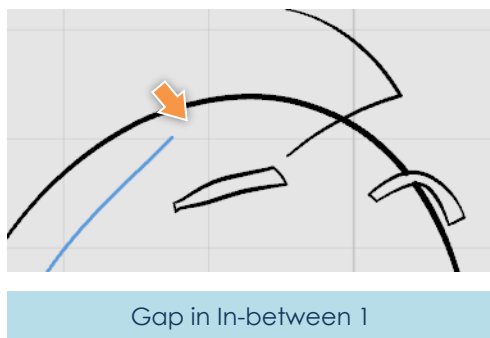
This function first detects T intersections in key frames. When found, it generally means that the strokes are connected to each other, and will form regions. Based on this information, CACANi will try to ensure that the same strokes are connected in the automatically generated in-between frames as well.

Using the Retain Stroke Connections Function

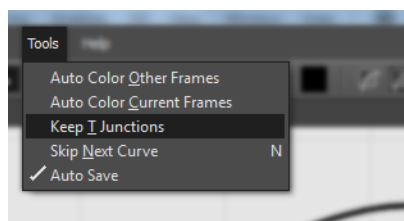
1. The example below shows a simple sequence with 2 key frames and 2 generated in-between frames.



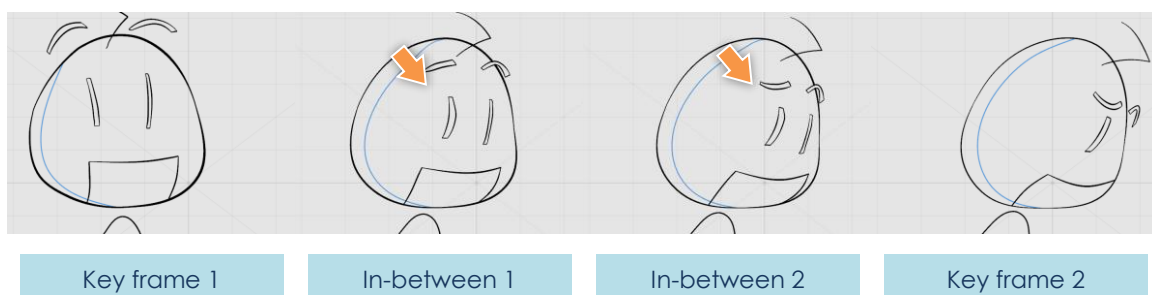
2. You will be able to notice that in the in-between frames, the blue separation stroke does not touch the black outline, unlike the key frames.



3. Select **Tools > Retain Stroke Connections**. Since T intersections can be found in key frames 1 and 2, the function will automatically close the gaps between the strokes in in-between frames 1 and 2.



4. The stroke gaps are now closed and the in-between frames are ready for painting.

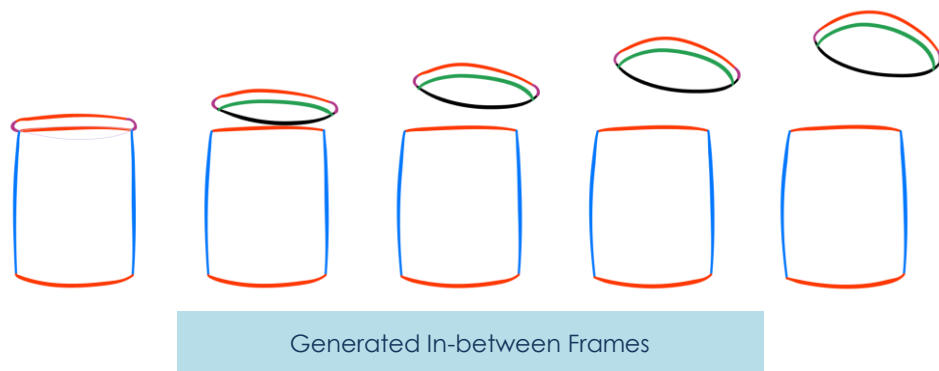


Guidelines for In-betweening

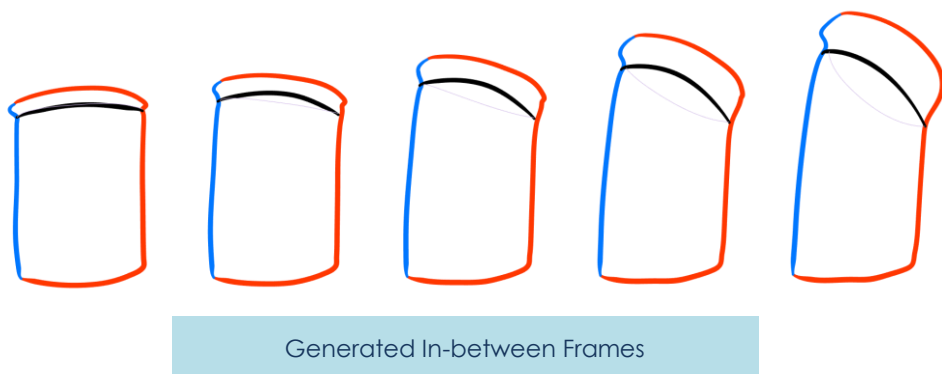
CACANi's unique in-betweening technology allows strokes to be automatically generated in in-between frames. However, to get the best results, there are a few guidelines to follow when drawing your key frames.

Separate Strokes for Different Parts

When drawing in CACANi, it is recommended to try to relate each stroke to a part of the object or character you are creating. In the example below, you can recognize that the object comprises of 2 distinct parts, the lid and the can. By drawing separate strokes (represented with different colours) for the lid and can, it will be easier for you to in-between the opening of the lid automatically.



Conversely, if you had drawn the lid and can with only 2 strokes (1 orange stroke and 1 blue stroke), the in-betweening result will not be good.



In-betweening Sharp Angles

When drawing an object or a character with sharp angles, like the example below, it is recommended to have separate strokes as well. This will help maintain the sharp angles in the in-between frames.



Generated In-between Frames

It is harder to generate in-between frames accurately when there are multiple sharp angles within a stroke.

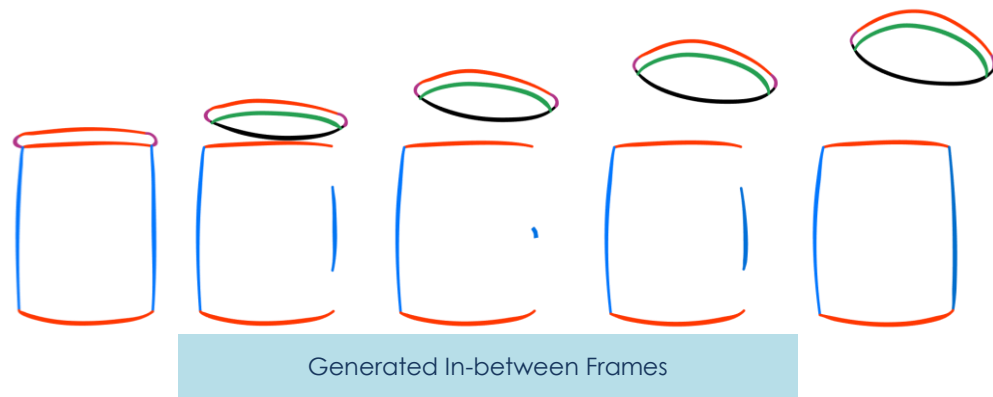


Generated In-between Frames

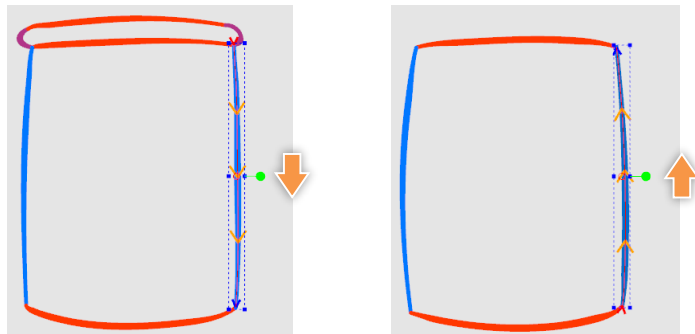
Corrective Features for Stroke In-betweening

It is inevitable that mistakes will be made when cleaning up key frames in CACANi. For example, strokes were drawn in the wrong direction, or in the wrong order. When that happens, you can make use of corrective features like **Change Direction** and **In-between Selected**, found in the Selection tool's context menu.

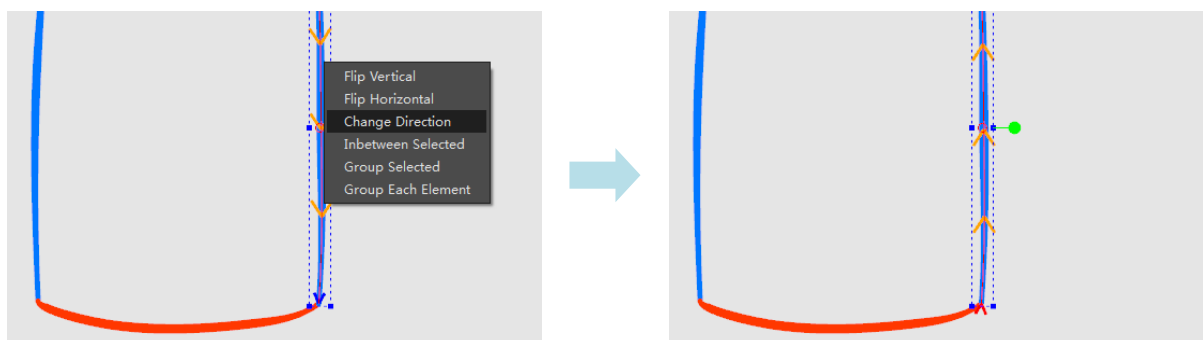
In the example below, one stroke is flipped in the generated in-between frames due a problem with stroke direction in the key frames.



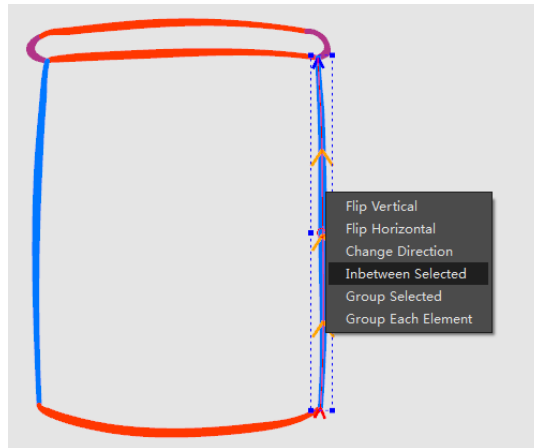
To view the stroke direction, use the Selection tool to select the stroke in the key frames.



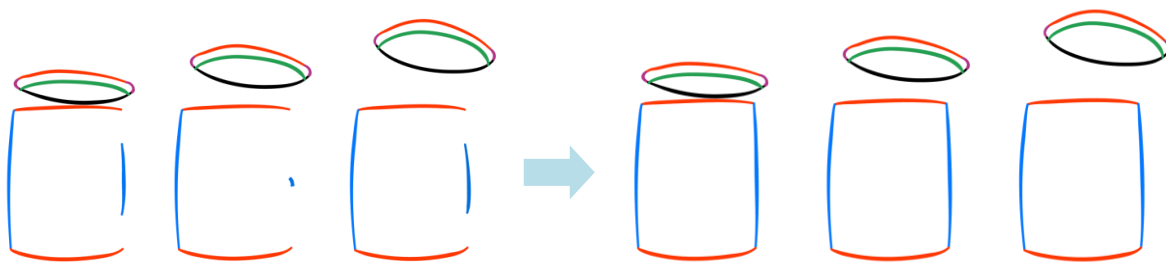
Still using the Selection tool, **Right Click** on the stroke in the first key frame to bring up the context menu. Choose **Change Direction**.



After changing stroke direction, the stroke can be updated in the in-between frames using the **In-between Selected** option, without affecting the other strokes. This is especially useful in cases when there have been extensive changes made to the strokes in the in-between frames.



With the corrections, now the in-between frames are generated properly.



Hiding Stroke Segments Last

During the process of animating, there is always a high chance that the strokes in the key frames or in-between frames need to be changed. As such, it is generally a good practice to leave any stroke segment editing / hiding to when the key frames are almost finalized, or after the in-betweening process has been carried out.

Keeping this in mind will help minimize time spent in the re-editing of stroke segments.

09

Painting Your Animation

A Dash of Sunshine

With all the innovation found in the in-betweening tools, we have tried to do the same with the painting process, by leveraging on the key frame information gathered earlier.

As a result, CACANi has an intelligent painting system that will help you to paint animation frames automatically.

But before continuing with the different painting tools, there is a need to understand how painting works in CACANi. On the canvas, before painting can be done, you must ensure that the strokes form closed regions. That can be done with the Clean Up Tool, or you can use the Stroke Editor to adjust the strokes so that they cling to each other.



Please refer to [Chapter 05 – Stroke Editor](#) and [Chapter 05 – Clean Up Tool](#) for different ways to prepare for painting.

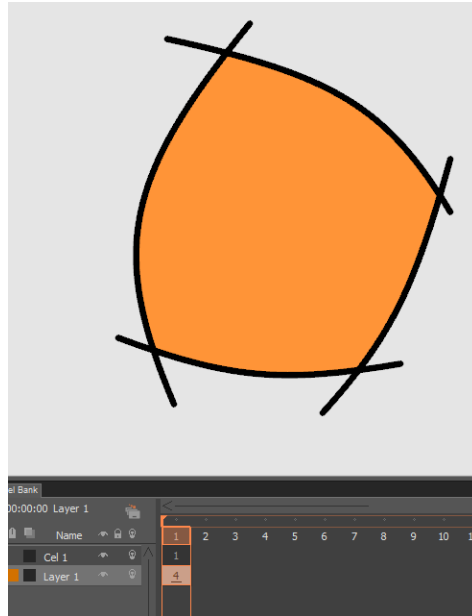
You can use the various region display modes to check if the regions are indeed closed.



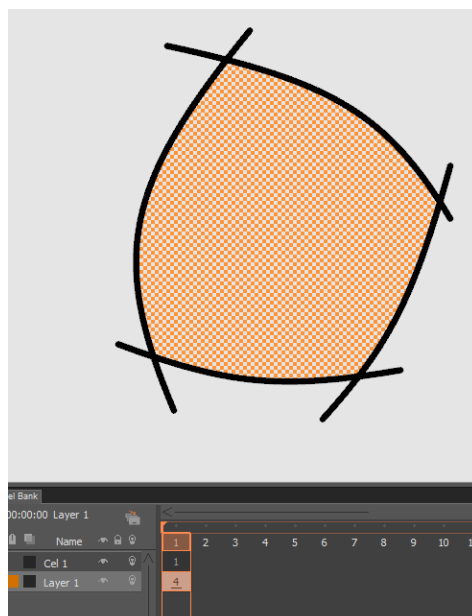
Please refer to [Chapter 06 – Region Display Modes](#) for more information on different ways of displaying regions.

Cross-Layer and Self-Layer Regions

Next is the concept of cross-layer regions and self-layer regions. In this example, as the strokes were all drawn in 1 layer, the region formed by the 4 strokes is a **Self-Layer Region**, or **Self Region**. The Self Layer Paint Tool is used to fill in the region.

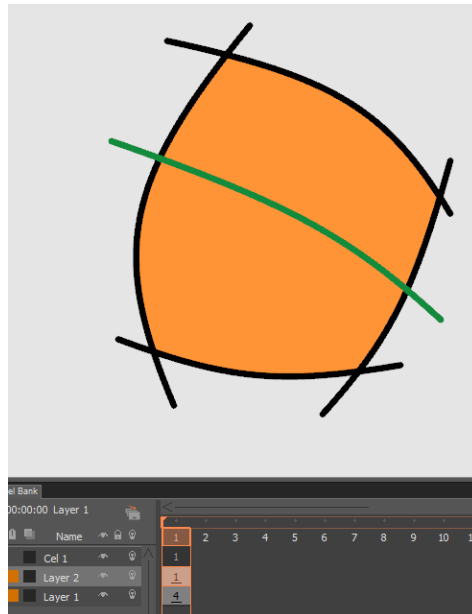


To verify this, you can enable the Highlight Self-Regions display mode. All self-regions will be displayed with a checkered pattern.

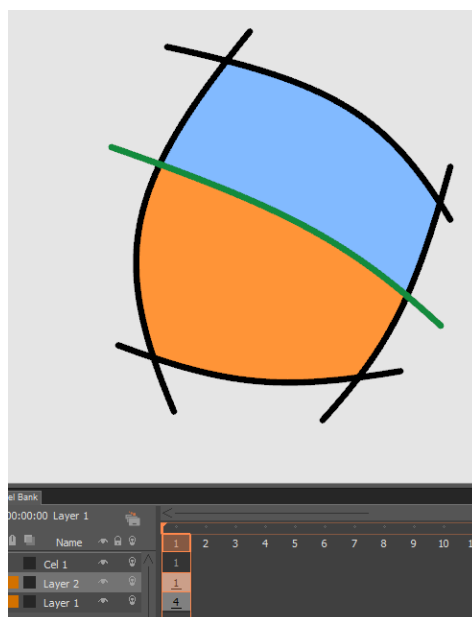


User Manual

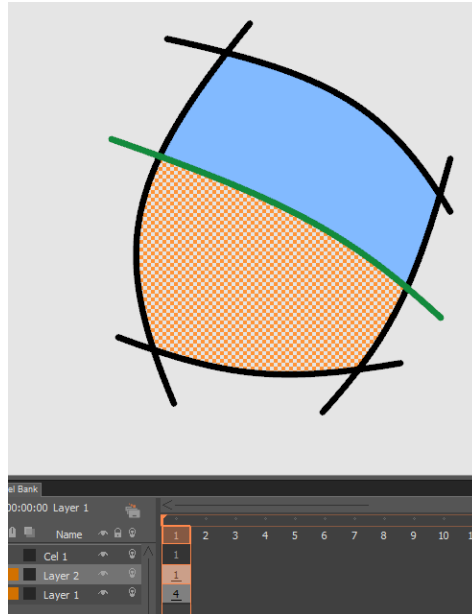
On a new layer, a green stroke is drawn. This new stroke does not affect the self-region underneath.



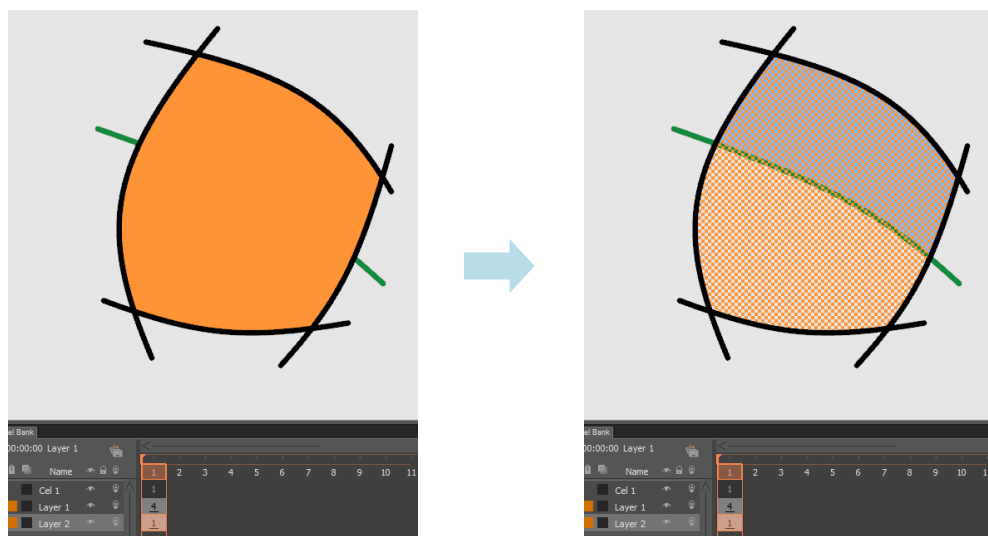
Rather, because the new layer is above the self-region layer, it intersects with the first 4 strokes and creates 2 distinct new **Cross-Layer Regions**. This is apparent when using the Cross Layer Paint Tool results in the new light blue region.



The self-region still shows the checkered pattern, while the light blue cross-layer region doesn't. In this case, as the green stroke is above the other 4 strokes that form the self-region, the cross-layer region hides the self-region.

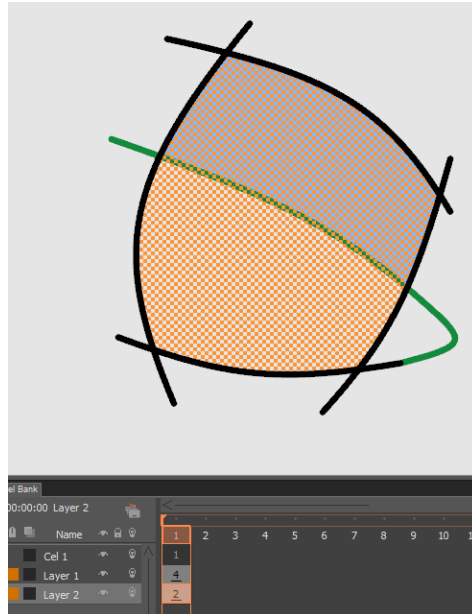


By reversing the order, now the 4 strokes are above the green stroke. As a result, the orange self-region is now hiding the light blue cross-layer region, as well as the green stroke. In Highlight Self-Regions display mode, the translucent self-region reveals the cross-layer region.

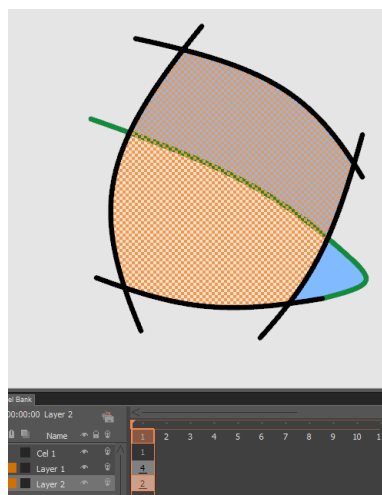


User Manual

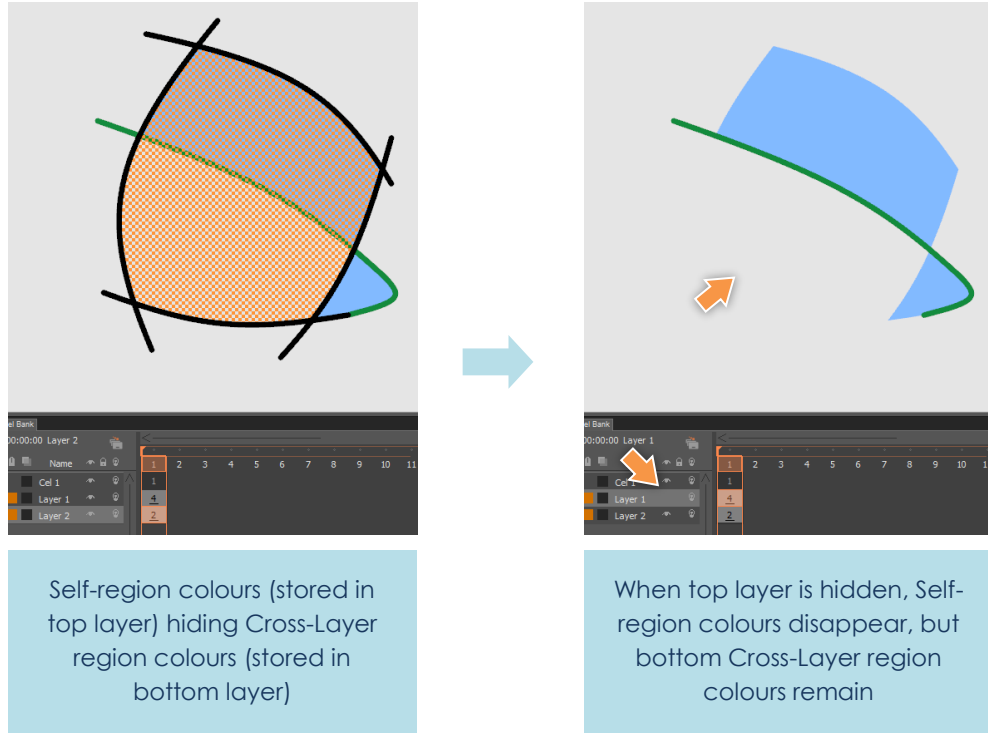
Taking the example further, another green stroke is added to the bottom layer, connecting the first green stroke in the bottom layer to the black stroke in the top layer.



Because the strokes that make up this region belong to different layers, there is no self-region formed. Using either the Cross Layer Paint Tool or the Self Layer Paint Tool will result in a cross-layer region with no checkered pattern.

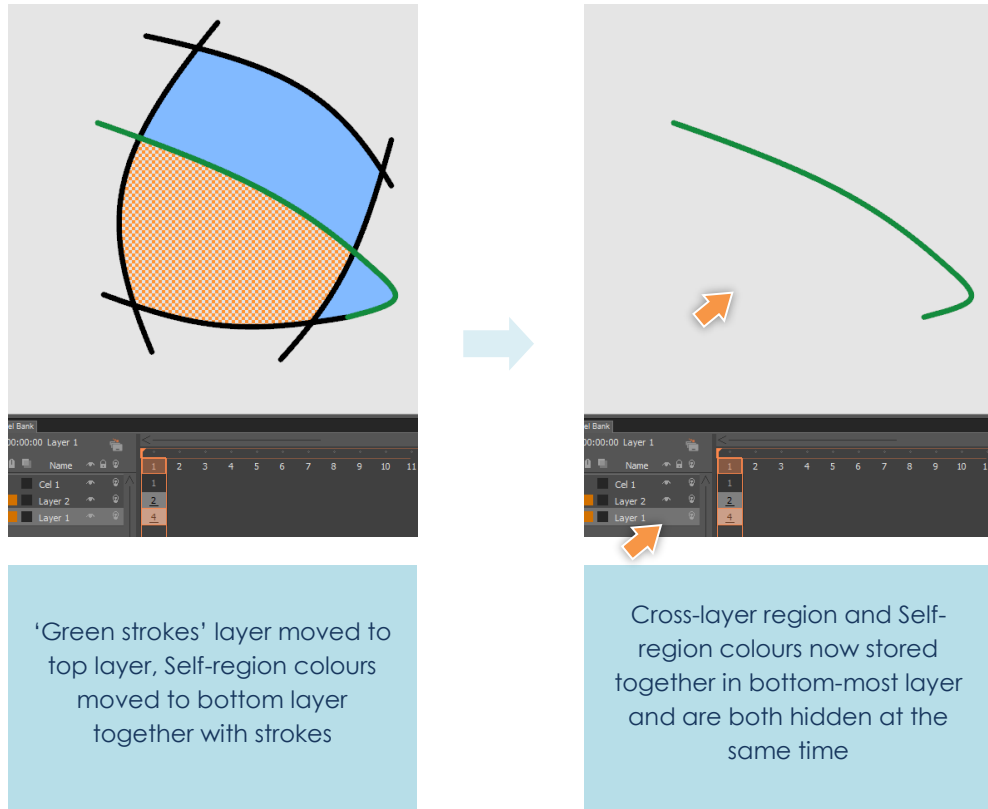


Another difference between self-regions and cross-layer regions is the layer where the colour information is stored. Since **self-regions** are formed by strokes on a single layer, the **colour information is naturally stored together in the same layer**.



User Manual

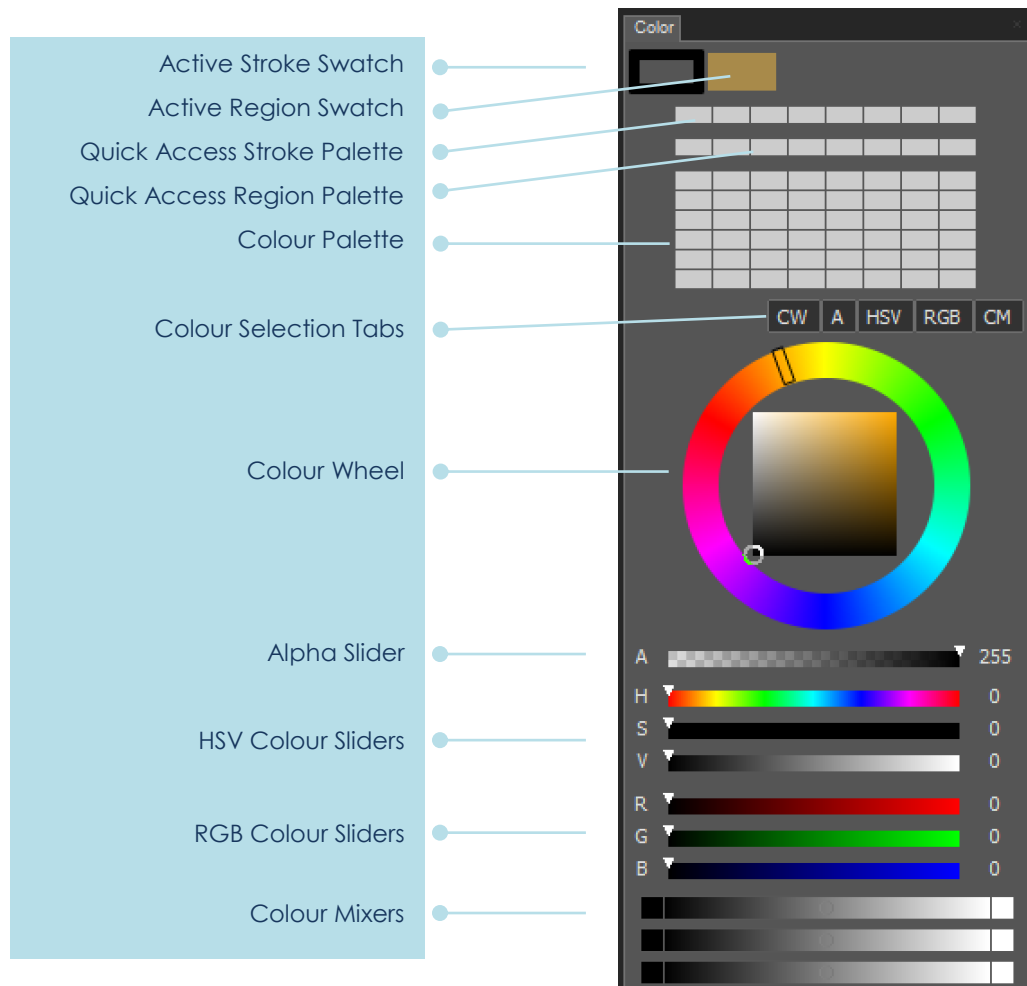
However, as **cross-layer regions** are formed by strokes from different layers, **colour information is stored in the bottom-most layer**. Understanding this is important, especially when attempting to hide layers.



Colour Panel

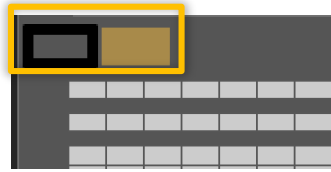


The Colour Panel is where you can define or change colours for selected strokes and regions. You can also store colour swatches for adjustments or testing.

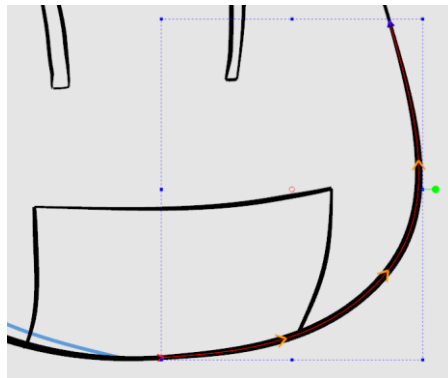


Active Stroke and Region Swatches

When active, it'll allow you to set or change the colour of the selected strokes or region.



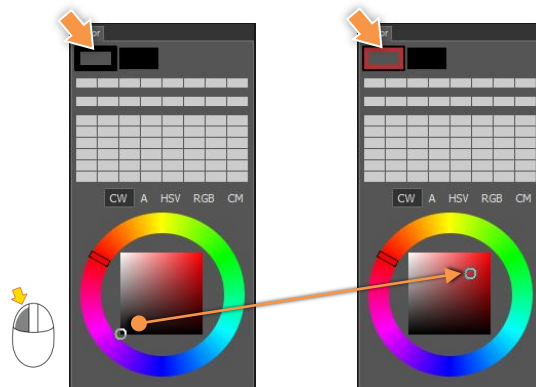
To change stroke colours, use the **Selection tool** to select the strokes.



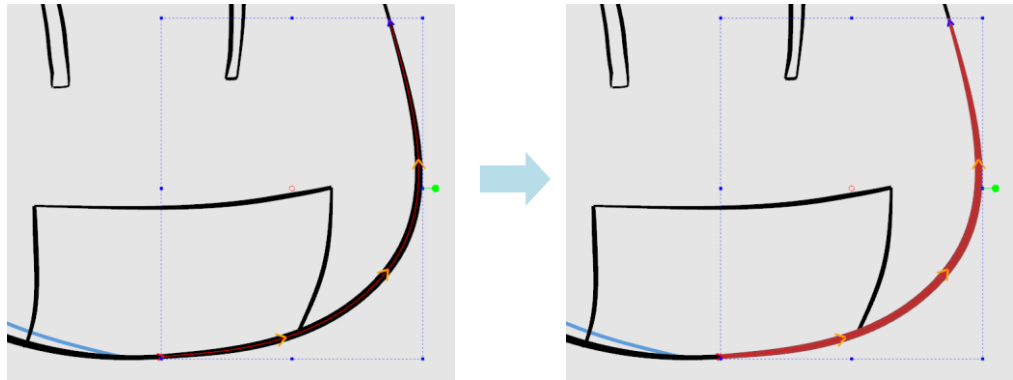
[Left Click] on the **Active Stroke Swatch** to make sure that the colour adjustment will apply to strokes and not regions.



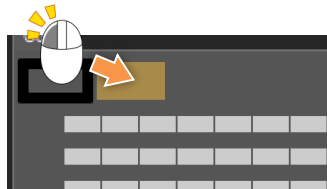
Enable the **Colour Wheel Selection Tab [CW]**. [Left Click and Drag] the circular indicator to a different colour in the colour wheel. The colour in the **Active Stroke Swatch** is now changed.



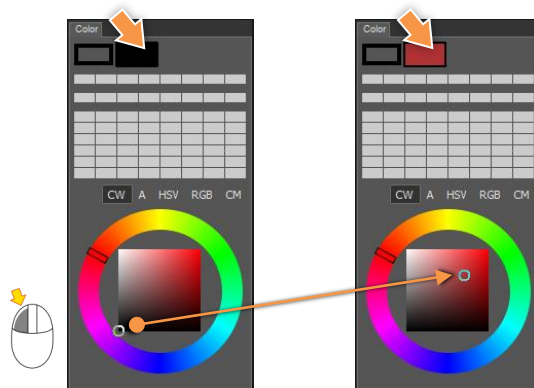
The colour of the selected stroke on the canvas is also changed.



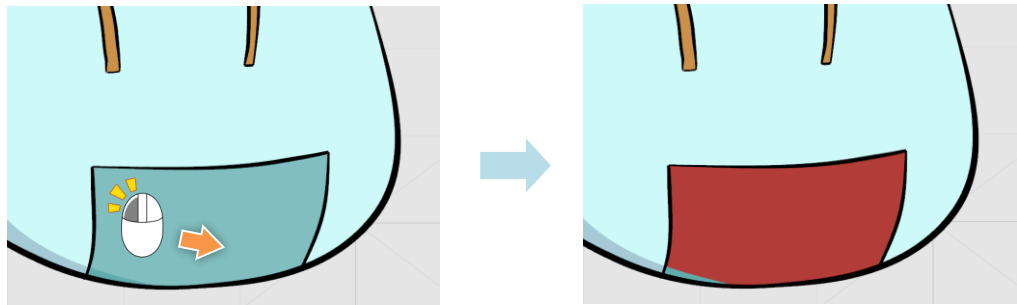
Unlike strokes, regions cannot be selected. [**Left Click**] on the **Active Region Switch** to make sure that the colour adjustment will apply to regions and not strokes.



Adjust the indicator on the colour wheel to change the colour in the **Active Region Switch**.

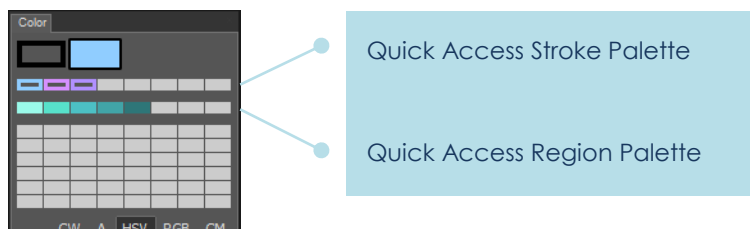


Select the **Cross Layer Paint Tool** and [**Left Click**] on a closed region on the canvas to fill it with the selected colour.

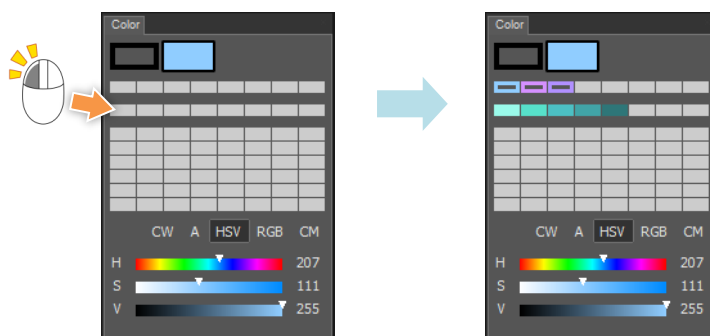


Quick Access Stroke and Region Palettes

Allows you to select swatches quickly from the dropdown menus in the stroke drawing tools or Cross Layer Paint Tool property bars. With the quick access palettes, frequently used colour swatches can be accessed from the property bar, and the need to have the **Colour Panel** opened all the time is reduced.



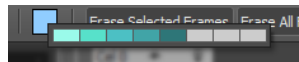
To add swatches to the quick access palettes, open the **Colour Panel**. [**Hold ALT and Left Click**] on any of the empty quick access swatches.



To use the quick access swatches, select any of the Drawing Tools, Painting Tools or the Selection tool. [**Left Click and Hold**] on the **Colour Selection Box** in the property bars. [**Left Click**] on a quick access swatch, and it will replace the colour in the Active Swatch.



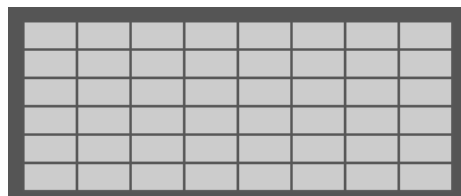
Quick Access Stroke Palette



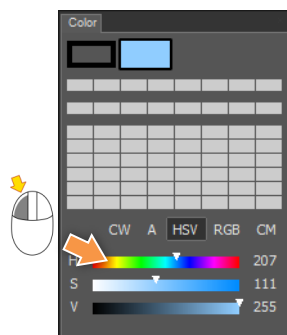
Quick Access Region Palette

Colour Palette

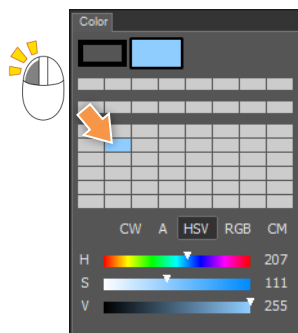
Allows you to store colour swatches for easier selection.



To add a swatch to the colour palette, first select a colour from either the colour wheel or the colour sliders.

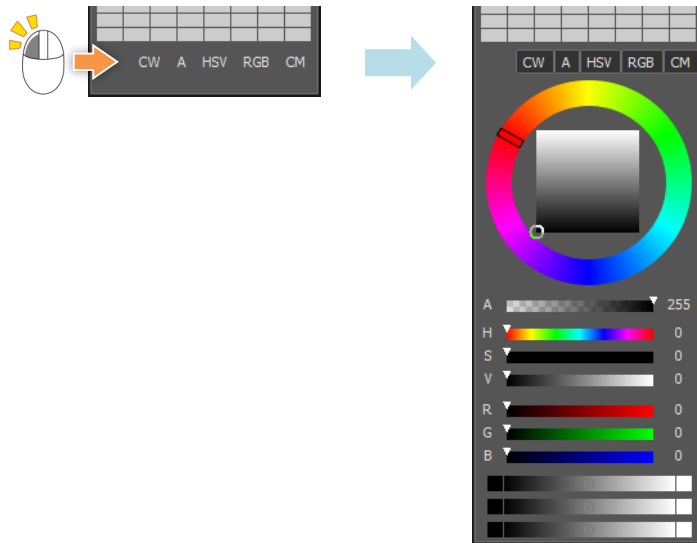


Then [**Hold ALT and Left Click**] on one of the empty swatches in the colour palette. The colour is now added.



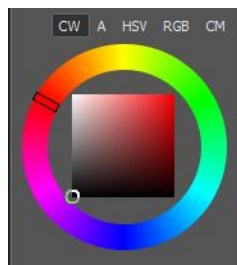
Colour Selection Tabs

Allows you to display or hide the colour wheel and various colour sliders.

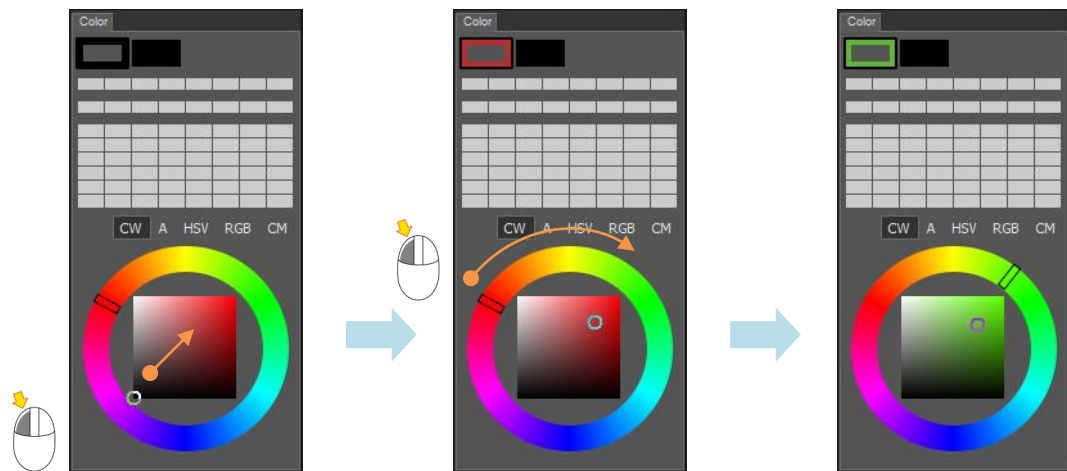


Colour Wheel [CW]

Allows you to define colours for the Stroke or Region Swatches through visual selection. The colour wheel consists of an outer colour circle, and an inner brightness square. Enable the colour wheel by [**Left Clicking**] on [**CW**].

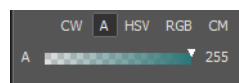


To vary the brightness of a selected colour, [**Left Click and Drag**] the circular indicator on the brightness square. To change the selected colour, [**Left Click and Drag**] the rectangular indicator on the colour circle.

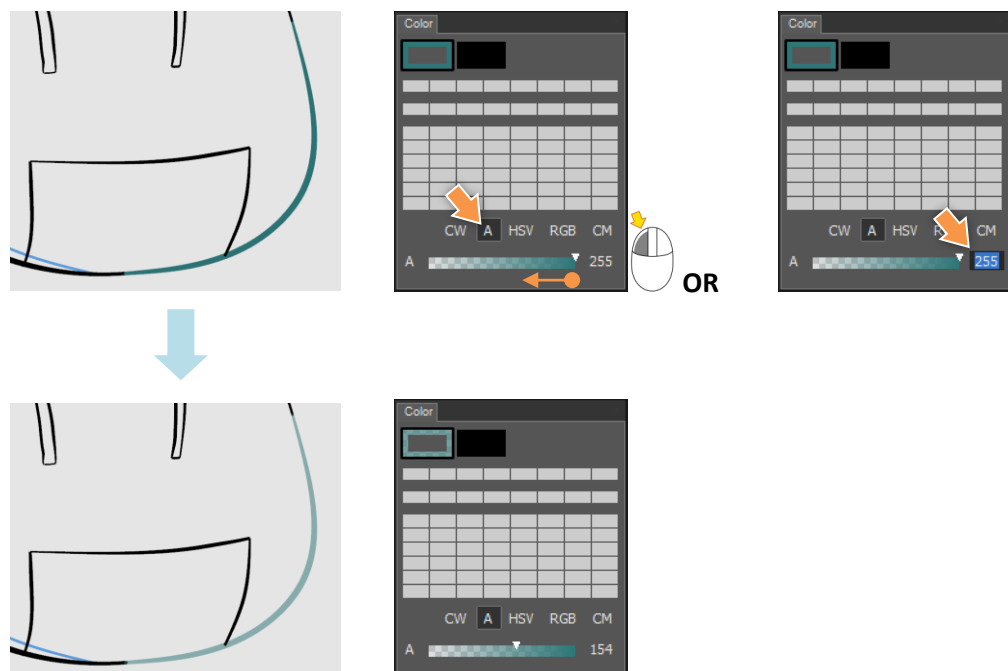


Alpha Slider [A]

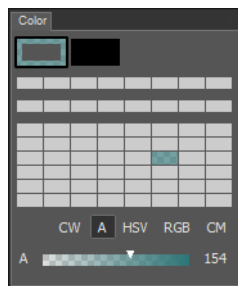
Allows you to define the alpha, or transparency, value of a colour for the Stroke or Region Swatches. To change the alpha value of selected strokes, enable the Alpha slider by [**Left Clicking**] on [A].



Adjustments can be made by either [**Dragging**] the triangular indicator, or by [**Left Clicking**] on the input field to key in the new value directly.

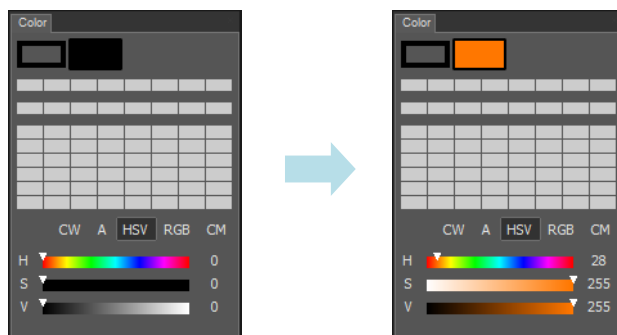


Colours with different alpha values can also be stored as swatches in the **Colour Palette**.



HSV Sliders [HSV]

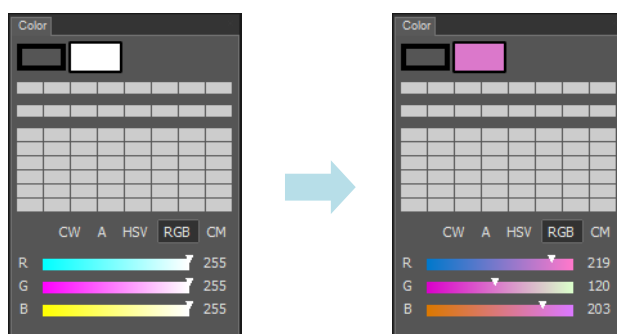
Allows you to define colours through the adjustment of H (hue), S (saturation) and V (black level) values. Enable the HSV sliders by [**Left Clicking**] on [**HSV**].



TIP! It's easier for artists to select colours using the HSV sliders than the RGB sliders, mainly because HSV sliders are visually easier to understand.

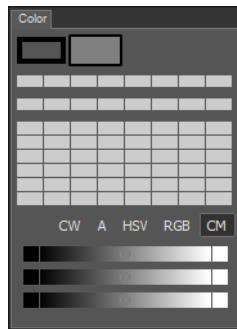
RGB Sliders [RGB]

Allows you to define colours through the adjustment of R (red), G (green) and B (blue) values. Enable the RGB sliders by [**Left Clicking**] on [**RGB**].



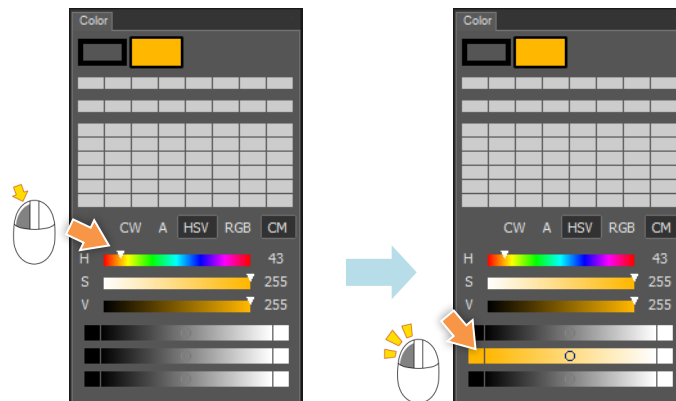
Colour Mixers [CM]

Allows you to define colours through the mixing of two user-assigned colours on either end of the slider. Enable the colour mixers by [**Left Clicking**] on [**CM**].

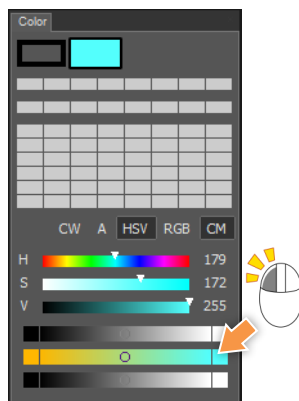


To assign colours to the mixers, you will first need either the colour wheel or the colour sliders. The HSV sliders are used in this example.

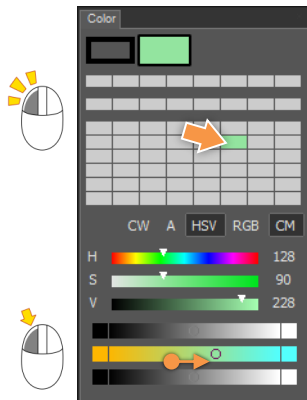
Adjust the sliders to a colour of your desire. Apply the colour by [**Left Clicking**] on one of ends of a colour mixer.



Select another colour, and then apply the second colour to the other end of the same colour mixer.



Now you can adjust the circular indicator to get a new colour mixed from the selected colours. Keep this new colour by [**Holding down Alt and Left Clicking**] on the colour palette.



Colour Picker Tool



Allows you to sample colours from the canvas. The colours can be from a stroke or region on the canvas, or from a loaded image in the Reference Image Layer.

Using the Colour Picker Tool

Select the Colour Picker Tool and [**Left Click**] anywhere on the canvas. The colour at the spot will be reflected in the Active Swatch in the **Colour Panel**.



Cross Layer Paint Tool and Self Layer Paint Tool Difference

The main difference between the Cross Layer Paint Tool and the Self Layer Paint Tool is the latter's ability to determine and paint self-regions.

The Cross Layer Paint Tool does not determine whether strokes are forming self-regions and can only create cross-layer regions. Hence, it is more useful and efficient when painting elements that do not require regions to hide, or occlude, each other.

Cross Layer Paint Tool / Self Layer Paint Tool



Allows you to fill a closed region with the selected colour by [**Left Clicking**] or [**Dragging**] on the region.



Using the Cross Layer Paint Tool

To paint a closed region, first pick a colour using the **Colour Panel's** palettes or colour sliders, then [**Left Click**] within the region.

To remove colour from a painted region, [**Right Click**] within the region.



You can also use drag selections to paint multiple regions, or remove colour from multiple painted regions. To do so, [**Left Click and Drag**] a rectangular selection over regions to be painted. Any region that falls within the selection will be filled with the same colour.

Conversely, to remove colours from multiple painted regions, [**Right Click and Drag**] a selection over them.



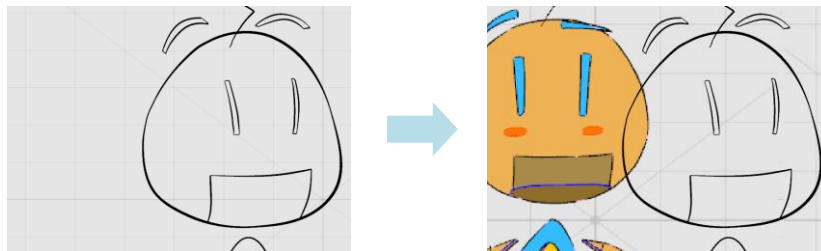
TIP! When painting regions, you may find that certain regions cannot be painted. One reason for this may be that the strokes forming the region have gaps amongst them.
(For more information, see [Chapter 05 – Clean Up Tool](#))

Sampling Colours from a Reference Image

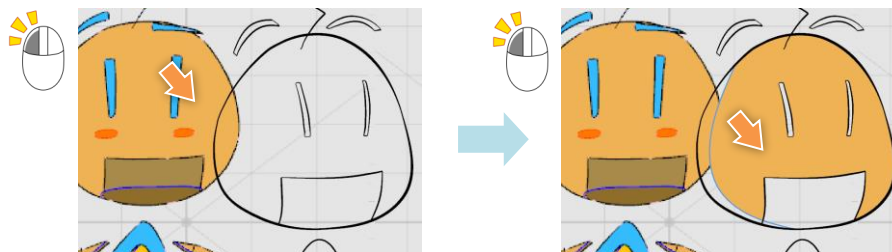
Other than selecting colours from the **Colour Panel**, you can also toggle the **Colour Picker Tool** from within the **Cross Layer Paint Tool**. Colours can be sampled from drawings created in CACANi as well as reference images loaded from external sources.

First, load a reference image into CACANi.

(For more information, see [Chapter 07 – Reference Layers](#))



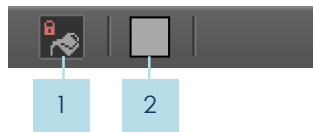
With the Cross Layer Paint Tool selected, [**Hold ALT + Left Click**] on the coloured image, then [**Left Click**] on the character's face. The face is now painted with the colour sampled from the reference image.



In this way, artists will be able to quickly sample colours from reference images and reduce the need for the Colour Panel.

Cross Layer Paint Tool Properties

Cross Layer Paint Tool has similar properties with Self Layer Paint Tool.



1 Replace Existing Colour

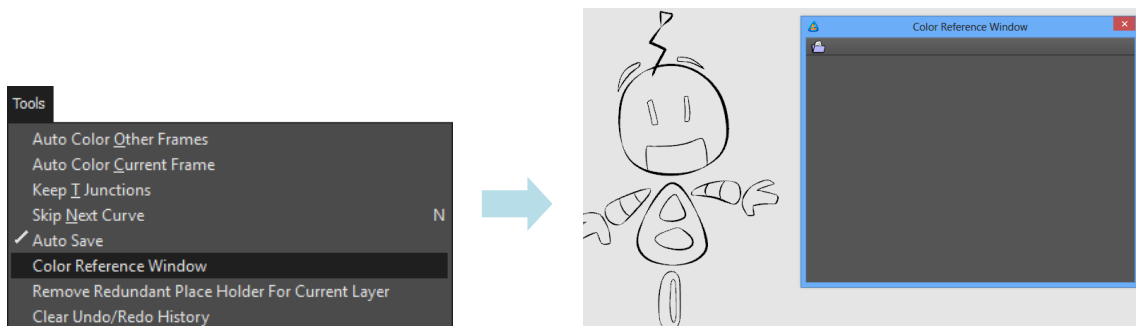
When enabled, you will be able to replace colours in painted regions.

2 Region Colour Selection Box

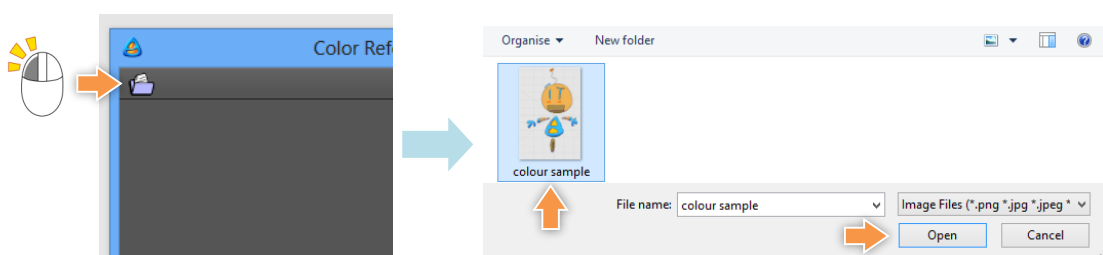
You can set the region colour by [**Left Clicking**] twice to bring up the **Colour Selection Box** dialog box. When done, just [**Left Click**] **OK** to confirm.

Using the Colour Reference Window

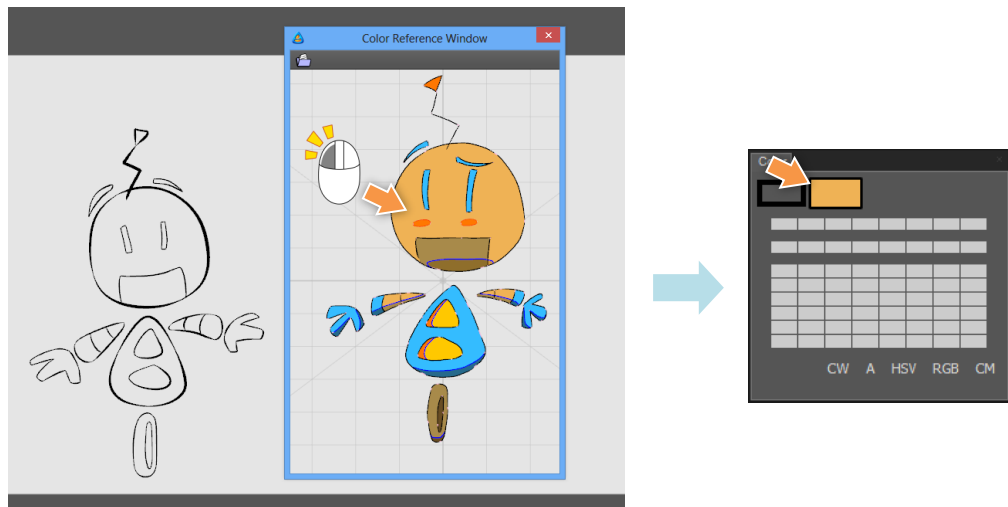
Other than loading the images into a reference layer, you can also use the Colour Reference Window (Menu > Tools) to load your images.



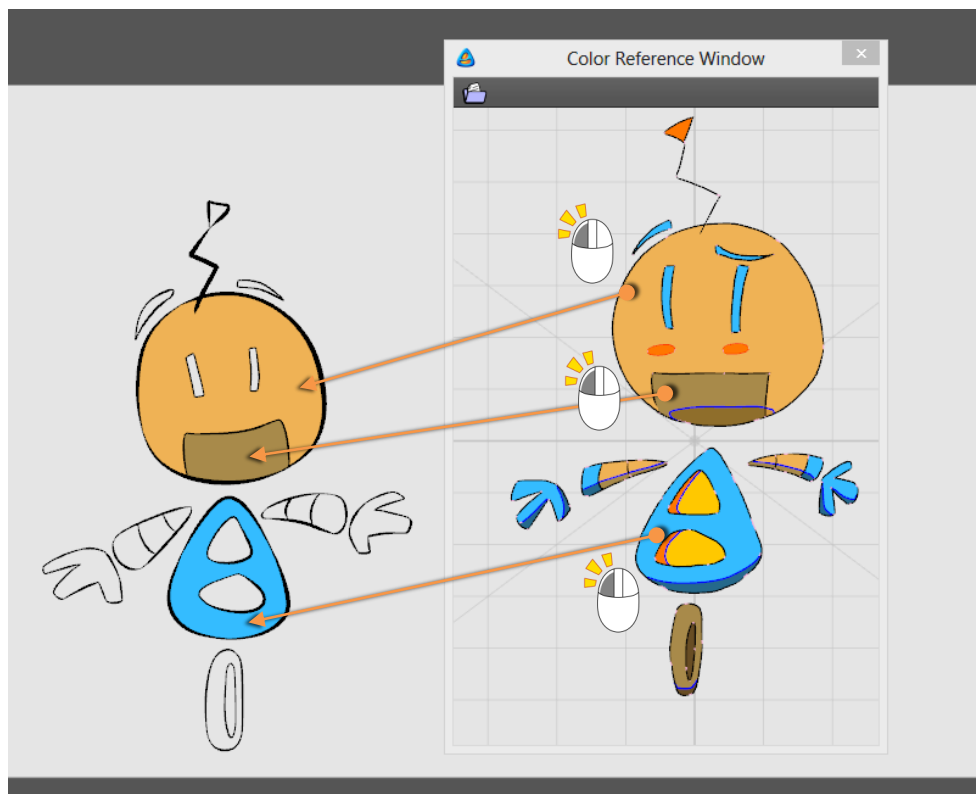
From the Colour Reference Window, you can Left Click on the Load Image icon to bring up the selection dialog box to load an image.



When you Left Click anywhere on the loaded image, the colour value at that pixel is sampled and automatically recorded as an active swatch in the Colour Panel.



Using the Cross Layer Paint Tool, you can proceed to paint the corresponding regions in the canvas.

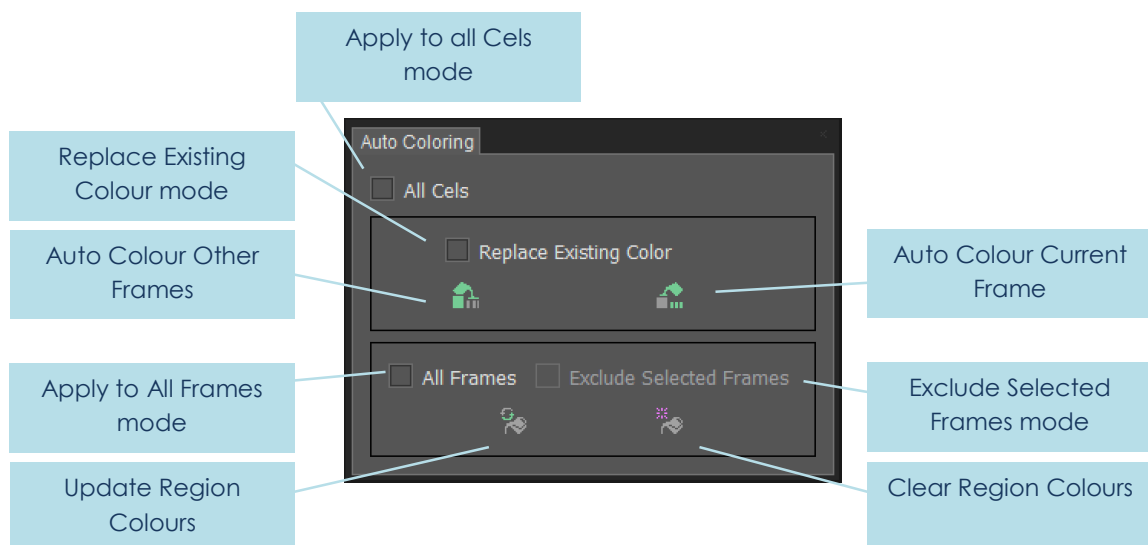
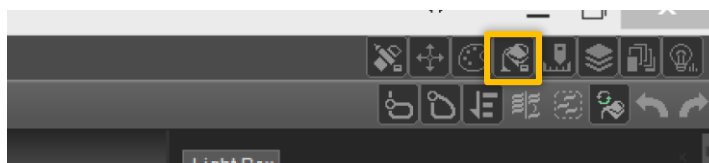


Assisted Painting System

Painting animation frames has always been a time consuming process, even on a digital, paperless workflow. However, CACANi's assisted painting feature will allow you to finally surmount this obstacle. By taking a painted frame as reference, CACANi can automatically paint the rest of the animation sequence for you, helping you save time and money.

Auto Colouring Panel

The Auto Colouring Panel provides you with tools to paint the frames easily. Activate it from the Panel Display Bar.



Apply To All Cels mode

When enabled, **Auto Colour Other Frames**, **Auto Colour Current Frame**, **Update Region Colours** and **Clear Region Colours** will affect all cels.

Auto Colour Other Frames

The painted regions of the current frame will be used to paint all other frames or frames in a selection.

Auto Colour Current Frame

Regions in the active frame will be painted with colours from the previous frame, or adjacent frames.

Replace Existing Colour mode

When enabled, **Auto Colour Other Frames** and **Auto Colour Current Frame** will replace colours in painted regions when applied.

Update Region Colours

If the regions of the selected frame are already painted, this will restore the display of the colours in those regions.

Clear All Region Colours

When pressed, all region colours in the selected frame will be erased.

Apply To All Frames mode

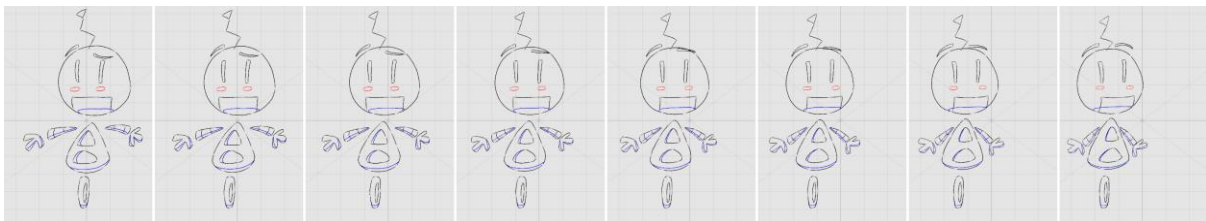
When enabled, **Update Region Colours** and **Clear Region Colours** will affect all the frames within the active layer.

Exclude Selected Frames mode

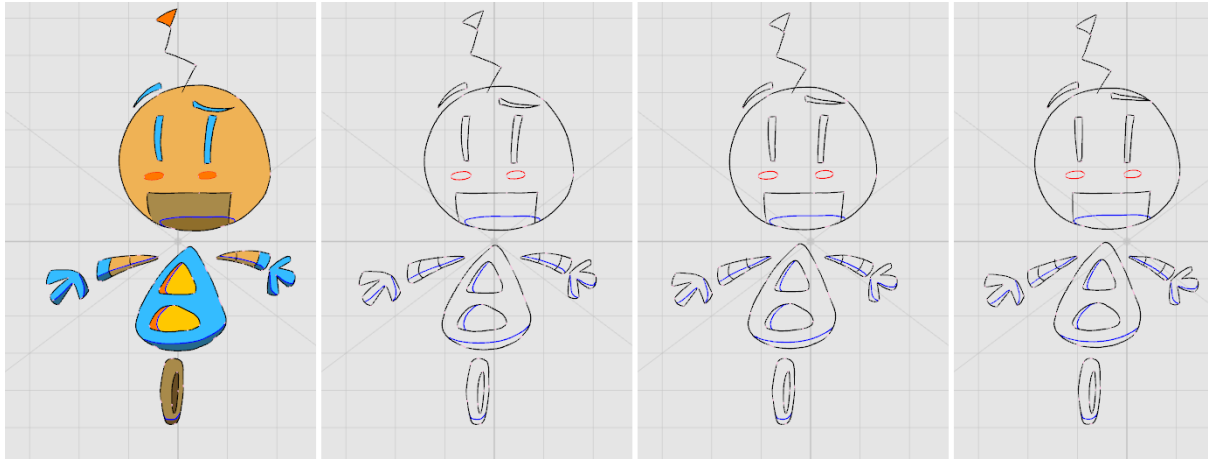
When enabled, **Update Region Colours** and **Clear Region Colours** will not affect the selected frames within the active layer.

Using Auto Painting

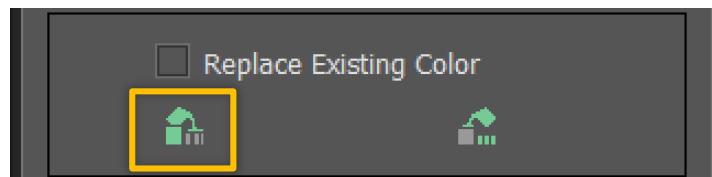
First, ensure that the regions to be painted in the animation frames do not have any unwanted gaps. This can be done by using the Cross / Self Layer Paint Tools and Left Clicking on any open areas to check for unclosed regions.



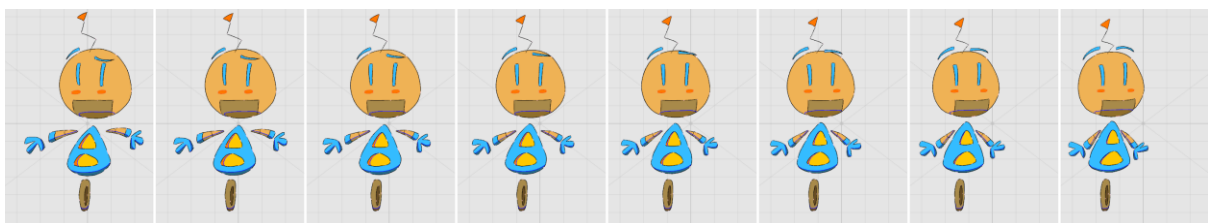
Select one of the animation frames and paint it. This will provide CACANi with the painting information for the rest of the animation sequence.



With the painted frame active, select the **Auto Colouring Panel**. Left Click on **Auto Colour Other Frames**. CACANi will now analyse and paint all other prior and subsequent frames in the animation sequence automatically.



IMPORTANT: The auto colouring process is based on matching strokes. If the regions are enclosed by the same strokes in all the frames, the auto colouring will be very accurate. In the example below, the character's head is based on the same stroke indices 01-05.



So, the colour regions enclosed by the same strokes in the head will be successfully painted automatically.

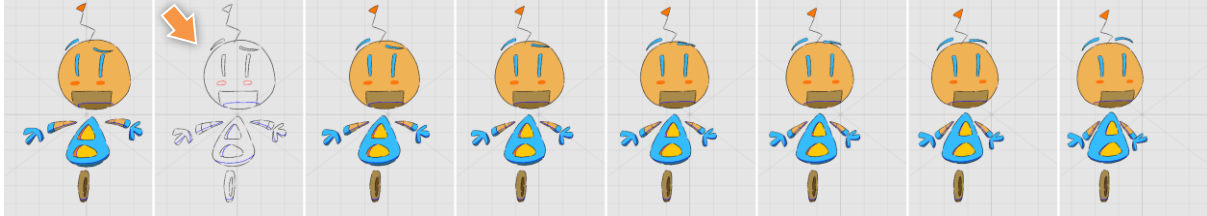
In addition, it is useful to understand how the auto colouring process works. From the 1st painted frame, it will be used to paint the 2nd frame. The 2nd frame will be used to paint the 3rd frame. The process continues until there are no more frames.

If there are still unpainted regions, you can use the Cross / Self Layer Paint Tools to manually paint those regions.

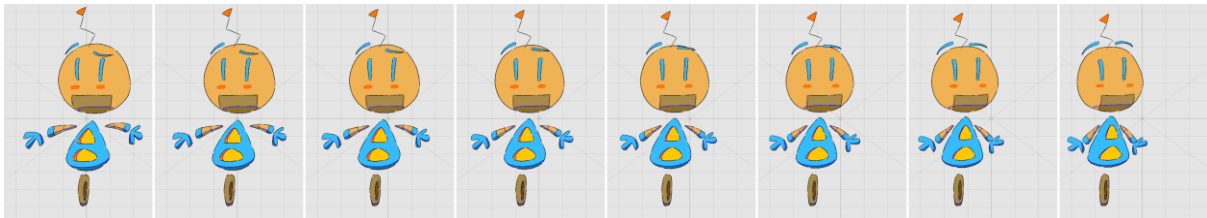
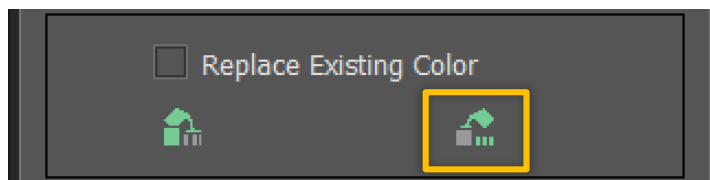
Auto Paint Single Frames

In the event that a new frame is created, or some adjustments were made to a painted frame, you can repaint the frame automatically without affecting the rest of the sequence.

Select the unpainted frame.



Apply **Auto Colour Current Frame** from the Paint / Self Layer Paint Tools. The selected frame will be painted based on the nearest painted frame.

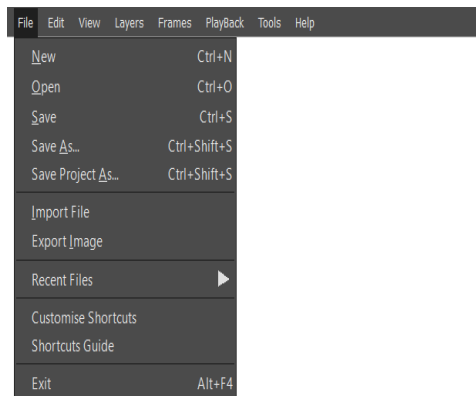


TIP! **Auto Colour Current Frame** is very useful when there are more complex drawings. You can check the painted frames one by one before applying **Auto Colour Current Frame** to the next frame.

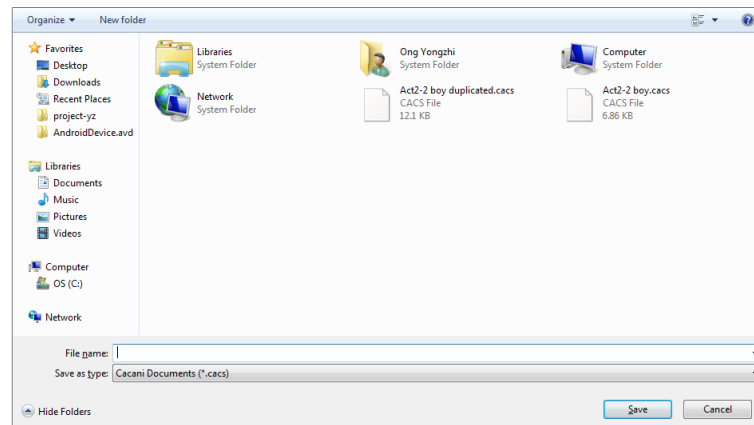
10

Completing Your Animation

Saving the Animation



From the menu bar, select **File > Save As**. Alternatively, press [**Ctrl + SHIFT + S**] to save a file. A **File Save As** dialog box will appear.

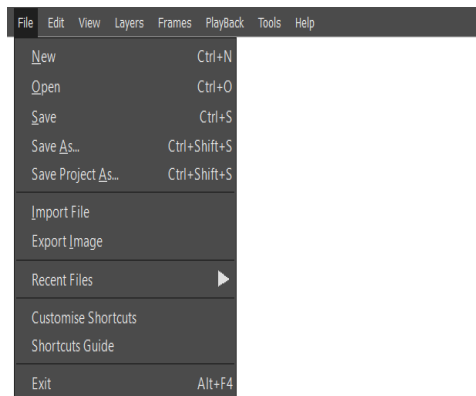


You will be required to enter a file name for their files. You can also choose the file format to save in.

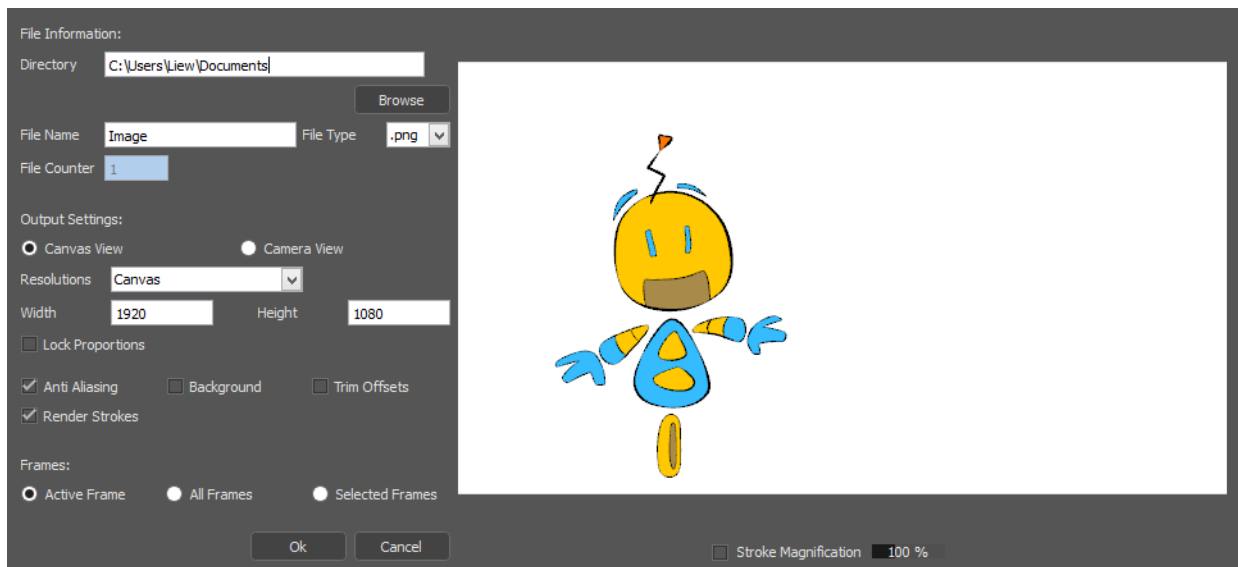
The **CACANi Documents format (*.cacs)** is the default file format for CACANi. All file information is saved.

The **CACANi Documents Xml format (*.cacx)** is a simplified file format where only essential file information are saved. It is suitable for exporting CACANi files to different versions of CACANi.

Exporting Images



From the menu bar, select **File > Export Image**. An **Export Image** Dialog box will appear.



A thumbnail window shows the current selected frame.

File Information

Directory

Allows you to save their file in the default **Documents** folder, specify your own folder location, or use [**Browse**] to select another folder of your preference.

File Name and File Type

You will be required to type in your preferred filename in the text field. You can choose the default **png** image format, or select a different format from the dropdown menu. CACANi supports **png**, **jpg**, **bmp**, **tiff** and **tga** formats.

File Counter

This allows you to assign a naming convention and appends a numeric value to the end of each frame's filename when they are exported from CACANi. This is only configurable when **All Frames** or **Selected Frames** are selected in the **Frames** property.

Output Settings

Canvas View

When selected, the export resolution defaults to the current resolution of the CACANi canvas.

Camera View

When selected, the export resolution defaults to the current resolution of the CACANi camera.

Resolution

A set of resolution presets. Larger resolutions will result in sharper images, at the expense of larger file sizes.

Width and Height

You can manually specify the width and height of the exported image, in pixels.

Lock Proportions

When enabled, the aspect ratio of the exported image will be kept similar to that of the previous aspect ratio defined in the **Width** and **Height** fields.

Anti-Aliasing

When enabled, strokes in the exported images will be anti-aliased and will look smoother.

Render Strokes

Disabling this option will result in the exported image showing the painted regions without the strokes.

Background

When enabled, all exported images will have an opaque white background.

Trim Offsets (range only)

When enabled, frames that have no visible information are not exported.

Export Range:

Users can choose between:

Active Frame

Exporting only the active frame shown on the canvas as an image.

All Frames

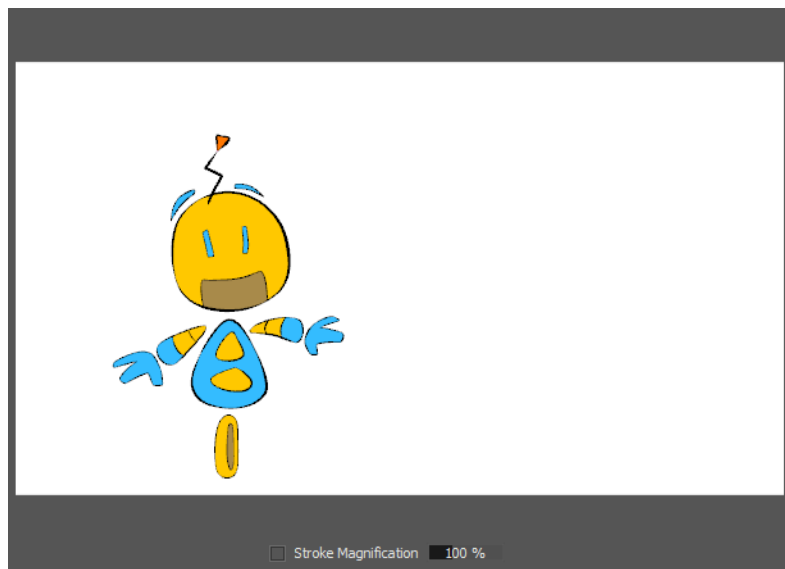
Exporting all the frames in the animation sequence as an image sequence.

Selected Frames

Exporting a selected range of frames as an image sequence.

Stroke Magnification

When enabled, strokes in the exported images can be thickened or thinned with the percentage slider, without affecting the original artwork.



END

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