

1. The RotoPaint Plug In

Jaleo RotoPaint is a paint system for fast and easy rotoscoping and retouching of Jaleo clips.

RotoPaint works entirely non-destructive. Instead of painting in pixels, as most paint systems do, all your paint actions are recorded and stored as vectorial “stroke” objects that you afterwards can edit freely. You can change color, brush, opacity or paint mode of a stroke, or you can move, deform or delete it. You can change drawing order of strokes, and you can even replace the image you paint on later without losing any of your work.

Normally, a freehand-drawn stroke (or any other geometric shape you draw) only “lives” in the frame you painted it, just as you would expect it in a paint system – but RotoPaint also allows you to animate your paint work. Animation comprises movement and deformation of shapes, brush attributes, and even write-on style animation.

Rotopaint in Jaleo 2.6 has changed compared with previous versions of Jaleo. Earlier versions have been a standalone utility, while RotoPaint 2.6 is now operating just like any effect inside the Jaleo environment. Although most paint operations remain the same, there are some fundamental differences in the way Rotopaint interacts with the Jaleo system. In addition, certain features have been added and certain ones are no longer applicable in this version. We recommend that all user read this updated manual before working with the Paint PlugIn.

1.1 Changes in Rotopaint

The biggest change in Rotopaint is that it is no longer a separate Utility from the Reel. It is now an integrated plug in that can be used just like any other effect in Jaleo. RotoPaint can either be used as a separate element generator, or it can be applied directly to a clip, or any layer of a composite stack. This offers up a great deal of flexibility for matte creation and rotoscoping.

Since RotoPaint is now integrated in the Reel, there is no need to render clips before using them in the paint interface. Additionally, all rendering is done in the Reel, so there is no need for a temporary storage directory.

Another change is that all strokes are now vector based, which means all their attributes, color, size, shape, placement, etc., can be modified or deleted at any time.

The Paint effect only stores the vector shape information. Nothing is applied permanently to the image until it is rendered, which means you can paint on one image and easily replace it with another, by changing the input to the Paint effect stack. The Paint effect can also be saved independently for reuse.

1.2 Applying PaintPlug Effect

Paint is now applied as an effect clip in the Reel.

Menu Location

Fx>Plug Ins>MorphedPainted Titled>PaintPlug

- Choose the Paint Plug-In from the Fx menu. The Paint plug in is represented in the reel by a red effect bar with an extent rectangle. This can be directly applied on top clip with the appropriate duration, or resized and wrapped around any clip or effect.

Inputs

Paint can have either one or two inputs. Following Jaleo's layering hierarchy, if there are two inputs, the first is the background, and the second is the foreground image. *The foreground/background relationship is used for functions like paint through and compositing. See below for a further examples of Background use in the Paint effect.*

- Input 1: If there is only one input, input one is the foreground and all alpha channel information is entered into the Paint's mask function. If there are two inputs the first image will be the background. The background's alpha information is disregarded.
- Input 2: The foreground image. The alpha information is entered into the Paint's mask function.

Outputs

- Image: The composited image with all paint operations, including composite if there are two inputs and the composite mode is activated.
- Mask: The alpha channel of the foreground image is piped through with all modifications to the mask made in Rotopaint.

1.3 Compositing for Quick Garbage Mattes

The Paint effect now has a composite mode that allows you to see a background image while you are painting on the foreground and its mask. This makes it very quick and easy to create and touch up garbage mattes.

In Composite Mode, Rotopaint acts just like a composite effect in the Reel, with the added advantage of being able to paint on the image or mask. You can also animate everything you draw.

A typical layering structure for compositing in Paint would be:

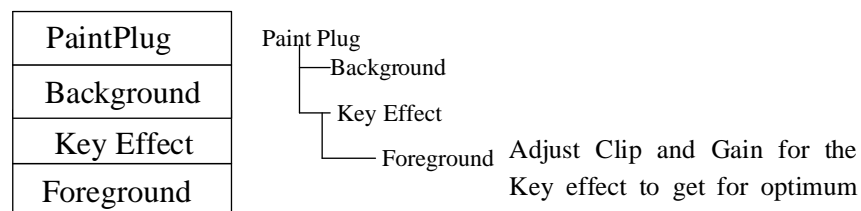


Figure 1. PaintPlug Composite Layering Structure

You can turn on the Composite mode from the SetUp menu in the paint interface and begin interactively painting or retouching the mask of image of the foreground input. The Composite mode can quickly be toggled on and off. See below for more information about using Rotopaint.

1.3.1 Opening the Paint Interface

With the PaintPlug effect selected, open the RotoPaint interface by choosing the View>Plug In option in the Time Editor menu bar. You will recognize the interface from the previous RotoPaint Application.

1.4 Application Window

The RotoPaint application presents you with its main drawing canvas, also including RotoPaint's menu bar. From the menu bar, a set of auxiliary windows or tool palettes can

be opened, containing paint attributes as well as shape, text and color tools. The Attributes and Shape Toolbox windows are popped up automatically at start-up.



Figure 2. RotoPaint

1.5 Using RotoPaint

1.5.1 Painting with Foreground and Background Images

Some brush types, depending on their paint operation, can use a foreground image or a background image as a “paint through” source. The Reveal brush is an example. These can be used for quick touch ups to images on the canvas.

The background image is determined by the number of inputs into the PaintPlug effect. Input 1, as always in Jaleo, is the background image and Input 2 is the foreground. *See Compositing for Quick Garbage Mattes above for a layering example.*

The Fg/Bg pulldown menu at the bottom of the screen selects which source the brush will use. The frame of the “paint through” source can also be offset using the Mix function. *See the Mix section below.*

In the Composite mode, you can touch up the composite image by painting either the foreground or background image back onto the canvas. *See the Reveal and Clone brushes below for a further description.*

To begin painting with RotoPaint, you only need to load the PaintPlug effect and open the Plug In interface from the Time Editor's View Menu. The Shape and Attribute tool-boxes will open automatically.

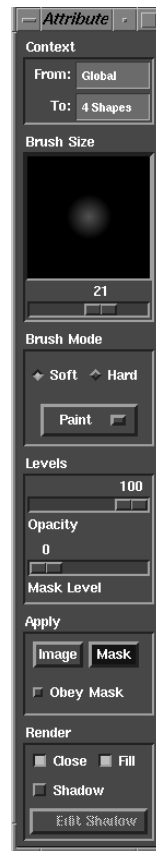


Figure 3. Brush Attributes

The Attributes Window shows you the current brush settings. The available brush attributes are:

- Brush Size
- Brush Hardness (soft/hard)
- Brush Type
 - Paint: Apply fresh color to the image
 - Drag: Drag the colors of the first pick position along the brushing direction
 - Blur: Apply a blur filter wherever you draw
 - Tint: Replace the images hue with the current color selection hue
 - Repair: Takes the average color of your first pick and use it as painting color. To use, click in an area of the canvas and paint. For a photorealistic image use in small areas with small brushes as Repair produces a “painted” look.

- **Reveal:** The Reveal brush uses a second image to paint through to the canvas. The second image specified by the Fg/Bg pulldown button at the bottom of the screen. If Fg is selected you can paint the foreground back on itself, or offset it using the Mix function (*see below*). If you select Bg, the background image will be used as the “paint through” source. This is a quick way to perform touch ups on composites. *For information on loading the background image, see Compositing for Quick Garbage Mattes, above.*
 - **Clone:** Copy-paint from one image area to another. To define the offset for cloning Hold the Alt key while clicking in the area of the image you want to clone from. Then click in the area you want to clone to and begin painting. *If Bg is selected the Fg/Bg Box you will clone the background image on the canvas.*
 - **Brighten:** Add to the luminance of the area your painting over.
 - **Darken:** Reduce the luminance of the area you’re painting over.
 - **Cutout/Custom:** *See the Cutout section Below*
 - **Distort:** Permits you to apply a distortion in x and y with a brush. Just like the distort effect in the reel, large distortions create optical-like effects on the image. To create warp-like effects, be careful and use successive small distortions, with smaller brush radii.
 - **Opacity:** Only applicable to painting on the image channels. It defines how opaque the newly applied color is. For non-paint brush types, it defines the strength of the effect.
 - **Mask Level:** The intensity (or opacity) for painting in the mask channel.
 - **Target channels**
 - **Image:** Apply all painting operations to the RGB channels of the image
 - **Mask:** Apply painting to the Alpha channel of the image
- Both channel selections can be active at the same time to apply a brushing to image and mask channels at the same time. Note that you have independent opacity control for mask and image.
- If neither Image not Mask channels are selected as targets, there will be no paint appearing on the canvas.
- **Obey Mask:** If this toggle is active, painting will be restricted to areas with non-zero pixels in the mask.
 - **Close:** Decides if vector shapes will be drawn opened or closed. For a closed shape, the last point will be connected with a segment to the first.
 - **Fill:** Decides if closed shapes are to be filled. As fill mode only makes sense for closed shapes, you must have a closed vector shape selected for this function to be applicable.

- Shadow: Strokes and Shapes now can also have shadows. These are activated with a toggle at the bottom of the attributes box. Shadows have the following attributes:
 - Offset in x and y
 - Color
 - Transparency

To edit shadow parameters, click the button aside of the shadow toggle in the attributes window.

Shadow parameters are fully animatable using the time editor.

Shadows can also be created as an independent object. Just create a shape and press the shadow button in the Attribute window. A new shape will be created that has the same shape as the currently selected shape, but the position, color and transparency as determined by the shadow attributes.

1.5.2 Changing Shape Attributes

The default settings give you a small white opaque brush, and they select image channels as a paint target.

To select a different color, open the color window from the windows menu.

You can now paint on the canvas, change brush attributes or color just as you want and when you want.

1.5.3 Cutout and Custom Brushes

Cutouts and custom brushes are created the same way; the only difference is the way the cutout area is applied: If you choose Custom, the shape of the cutout is used just like a normal brush: monochrome with a color specified in the color chooser window. In Cut-out mode, the brush is rendered with the colors of the original image, just as cut out.

To create a brush, you must delimit the canvas area you wish to use for the custom brush. This can either be done by painting in the mask, or by drawing a vector shape. Once there is either a selected closed vector shape on the canvas, or something is painted in the mask, you can use the buttons Mask, Shape or Shape Mask from the Shape toolbox window to actually create the brush.

- The Mask button will take all pixels covered by non-zero mask values and interpret them as part of the custom brush.
- The Shape button will take all pixels under the selected shape and copy them to the new brush. The shape will be deleted automatically after the Shape button is pressed.

- The Shape/Mask button takes all pixels with non-zero mask values and copies them to the new brush, but only if they lie inside of the currently selected shape. The shape will be deleted automatically after the Shape/Mask button is pressed.

You will be prompted with a file selector box. Please enter or select a file name to store the cutout into.

The created cutout brushes are immediately useable for painting by choosing Cutout or Custom from the paint tool option menu.

There is a window, accessible from the cutout menu, that contains graphical representations of all cutouts. Note that you can switch the display between image and mask channel.

By selecting Cutout from the brush type selector, you can paint with the cutout, using its original colors. The cutout will be scaled according to the brush size slider.

If you wish to create a normal colored custom brush, using the color from the color selector, you should create an image with the brush profile and shape in the mask channel. Then use the Mask button from the toolbar to create the brush. If you now select Custom from the Brush palette, you can draw with the new shape.

Note: If you save shapes created with cutout or custom brushes, the stored shape file contains references to the brush files you created when cutting out the shape. You must keep these shape files, or the shape file will be reproduced incorrectly (if the original shape file can not be found, a default brush will be substituted).

1.6 Attribute Source/Target

At the very top of the RotoPaint Attribute Window, you can find two text fields labelled “From” and “To”. These specify the source and target for the attribute application.

“From” displays the source from which the current attributes are recalled. It can either be a be any number of shapes or Global. Global attributes can be from any or all of the shapes.

“To” displays to where the attributes are being applied. This can be any number of shapes or Global which can apply to any or none of the shapes.

1.7 Main Window Tool Bar

The toolbar at the bottom of the main window of RotoPaint presents important tools:

Figure 4. RotoPaint Canvas Window Tools

1.7.1 View Toggles

These buttons, labelled I and M, toggle visibility of image and mask channel in the canvas window. The mask is displayed in blue. Note that paint can be applied even if the visibility for the corresponding channel is switched off. For example, you can view the image channels for reference, but paint to the mask channel at the same time without even seeing it. Paint application is controlled by the Image and Mask button in the Attribute window.

1.7.2 Color Pickers

With the pick buttons for image and mask channels, you can pick a color from the image or the opacity level of the mask. After selecting either of these buttons, the next pick into the canvas reads out the color of the pick location or the mask level of the mask location. Color picking is automatically switched off after the pick, so that you can paint on immediately.

1.7.3 Zoom

With the “+” button, you can zoom into the image, while the “-” button zooms out. Clicking either button changes the cursor into a magnifying glass. The click location will be centered on screen after picking on the canvas. In the paint menu bar, a reset function for the zoom can be found. Just like the color picker, the zoom will deactivate itself after the pick in the image.

Scrolling Within the Paint Window

Note that images can be scrolled by dragging the image with the mouse or pen while the CTRL and ALT key down at the same time.

1.7.4 Mix

With the mix function, you can under-lay another image of the sequence you are working on under your canvas. This is like painting on semitransparent glass, showing you a template or reference for your work. The mix can be activated and deactivated, and you can set an offset. The offset determines which frame of the animation will be placed under

your canvas. By default, this is the last frame, i.e. an offset of -1. You can set any positive or negative offset.

In field mode, offsets are counted in fields. An offset of -2 will then move back one frame.

1.8 Rotoscoping Tools

Rotoscoping is controlled using the controls at the right of the toolbar.



Figure 5. Rotoscoping Controls

When you open the RotoPaint interface, the first text field in the bottom right of the canvas window will show the current frame of the clip. This frame is determined by the position of the red clip cursor in the PaintPlug effect. The default position is frame 0. The text field one step further to the right will show the total number of frames in the clip currently edited. The Current Frame field can be edited, the total number of frames field is not editable.

1.8.1 Field Editing

You can edit clips created with the interlace flag activated either in frame or in field mode. By default, frame editing mode is selected. To switch to field mode, use the toggle labelled Fields at the right side of the rotoscoping tools. You can work in both field or frame modes. When you switch to field, painting done on frames will only appear on the first field, so normally you will want to switch to field mode before you begin.

If you switch from field to frame mode, painting done on both fields will be combined. In addition all animation functions will be performed with respect to which mode you are in. For example, all animations done on Field 1 will pertain to Field 1, when in the Field mode.

When you switch to Frame mode and animate shapes, they will be applied to both Fields. Additionally, once shapes enter the Frame mode they are applied to both fields.

If you are working with fields, make sure that the Fields option is selected when you render the effected clip in the Reel.

1.8.2 Scrolling Through Frames and Playback

There are Four ways to move through the clip in the paint interface window:

- You can always use the rotoscoping scroll bar to select a frame of the current clip. While you grab the scroll bar with mouse or pen, small preview images of the clip are displayed centered on the canvas. You can thus trace the images and decide easily which image you want to edit next.
- You can also advance to the next or previous frame by clicking the arrow buttons at either side of the rotoscoping scroll bar.
- Additionally, you can use the Shuttle menu of RotoPaint to have the clip played back on the canvas. Playback using the shuttle always starts from the frame currently displayed on the canvas.
- Finally, you can now scroll through the clip using the red clip cursor in the PaintPlug effect clip in the Reel.

(While scrolling with the effect clip cursor, the image will update in the canvas window, but the frame number window will not update in the text field if the Time Editor is not open. The Time Editor can be iconized down, but it must open for the text window to update.)

1.9 Using Strokes and Shapes

RotoPaint now uses only vector shaped painting. All mouse or pen movements “painted” by the user are saved as a vector shape. Unless selected, these vector shapes are transparent. A paint stroke begins with pressing the left mouse button or the pen tip and ends whenever you let go mouse button or pen.

For the user this does not make a big difference in the first place, as the system behaves during painting just like pixel painting. However, you can now Undo any paint operation partially or complete. After selecting the shape edit tool from the Shape Window, strokes are shown as vector shapes that can be moved, scaled, rotated and deformed, both as

splines and as polylines. Also, all brush attributes and stroke drawing order can be changed afterwards.

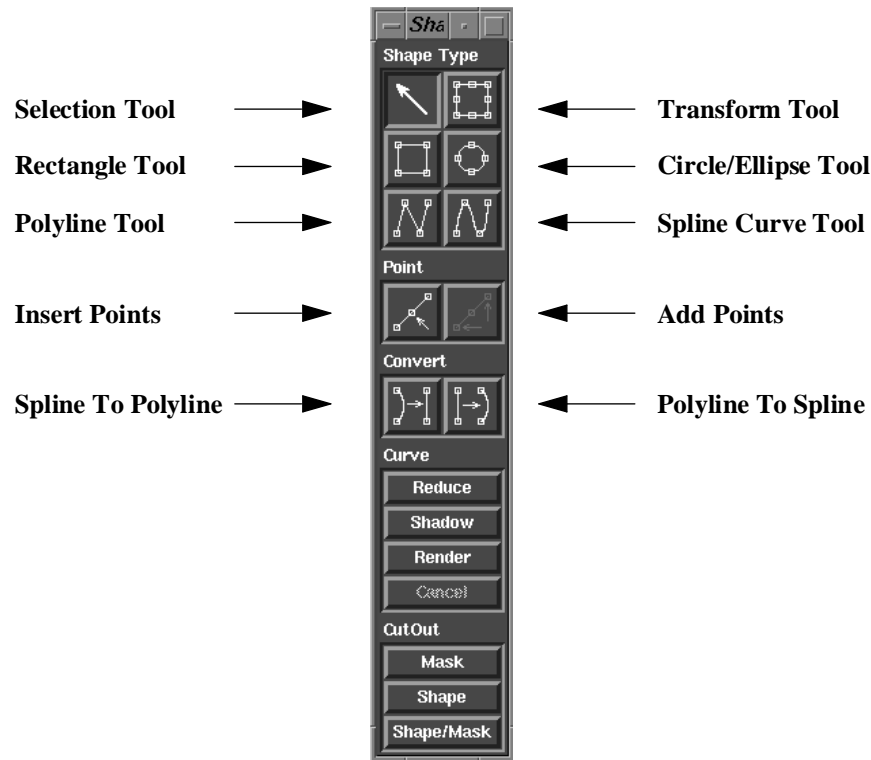


Figure 6. The Shape Window

To try out painting, simply begin painting on the canvas. Now, after creating a few paint strokes, select the arrow button in the upper left corner of the shape window. You will see all strokes be drawn as vector lines, with the mouse movement samples shown as the vertices of a polyline. Using the various shape modification tools, you can now

- Select one or more complete shapes or sets of vertices, either from one stroke or from a number of strokes.
- Move, scale and rotate strokes and/or selected vertices
- Change drawing order
- Change all brush attributes for complete shapes selected
- Convert strokes to Bezier splines, drastically reducing their complexity without changing their shape
- Add vertices to or delete vertices from strokes
- Delete complete strokes
- Create geometric shapes and text
- Cut, Copy and Paste shapes in the same or between different frames

1.9.1 Shapes Versus Strokes

Both shapes and strokes are geometric vector shapes. The main difference between these two is the way they are created:

- Strokes are created by freehand painting, they are paint strokes in the sense of the word.
- Shapes are geometric figures created by construction: You can use basic shapes like circles, rectangles or letters, or you can create shapes from line segments or splines.

Once you have created shapes or strokes, both can be handled with the same tools. You can select either single control points or complete shapes and manipulate these points in various ways.

1.9.2 Creating Strokes

As you have read above, strokes are simply created by painting. All the attribute settings from the Attribute window are fully applicable to Strokes, including the paint type and the target channel settings. Remember, if no target channels (Image or Mask) are selected, you will not be able to paint.

By default, a stroke created is a polyline containing all the mouse or tablet samples used to originally paint following your movements.

As a painted polyline typically has a great number of vertices, a fact that does not exactly facilitate editing, the Reduce function, located in the Shape Tools window, can be used to fit a Bezier spline through the samples created by painting. This will create a spline curve that for all practical uses has the same shape as the polyline, but much less control points, that, as all Bezier curves, sport tangent control for easier editing.

You can also convert the polyline into a spline curve by either simply adding tangent control to the original sample points. In most cases, though, you will want to use the Reduce function for editing of vector paint strokes.

1.9.3 Creating Shapes

There are five tools to create shapes. Four of them are located in the Shape Toolbox window:

- The Circle Tool to create circles and ellipses
- The Rectangle Tool for rectangles and squares
- The Polyline Tool for open polylines and closed polygons
- The Spline Tool for open or closed spline curves

The Text Tool, used to create text blocks is located in a separate dialogue box and is covered later in this manual.

For Shapes, as for strokes, all the attributes from the Attributes Window are applicable. In particular, you must select a target channel (i.e. Image or Mask) for the result being visible.

Creating Circles and Rectangles

To create circles and rectangles, select the appropriate tool from the Shape Toolbox. Creating shapes requires that either the Image and/or the Mask target channel of the Canvas are activated in the Attribute Window. You can now drag out the shapes on the canvas. Rectangles will be started at a corner; which corner of the rectangle this will be depends on the direction of your drag. Circles are started in the center.

Note: If you press and hold the <Shift> key while dragging a shape, the created shape will be constrained to perfect circles or squares.

After you drag out the vector shape, it will be automatically rendered using the current paint attributes. It can be edited and modified as any other shape later, though.

Creating Polylines and Spline Curves

To create a polyline or spline shape, select the appropriate tool from the Shape Tool window. You must have at least one of the target channels activated (Image and/or Mask) in the Attributes window). You can now start to click on the screen, placing points wherever desired. While you keep the left mouse button pressed down, you can move the newly appended point; it will only be fixed when you let go the mouse button. A shape will be finished when you double click the mouse. The position where you do the double click will not be included in your shape. The last point of the shape is the last point where you did a single click.

Depending on the setting of the Close attribute, you will see the shape as a closed figure as soon as you insert the third point. You can change the setting of the close attribute while you are drawing.

As always, after finishing the shape, it will be rendered using the attributes settings from the Attributes Window.

1.9.4 Shape and Stroke Modification

Once shapes (or strokes) are created, you can edit them. As there is no difference with respect to editing between shapes and strokes (except for the Stroke Undo that has already been discussed), we will in the remainder of this chapter treat shapes and strokes as a single entity.

To see the shapes, that after creation are automatically rendered using the current attributes, as vector outlines ready to edit, you can click on the Arrow tool in the left upper corner of the Shape Toolbox. On the canvas, the vector outlines will be overlaid on the rendered images.

You can now select and modify any combination of shapes and control points. While you can move, scale and rotate any combination of control points and complete shapes, changes of attributes can currently only be applied to a complete shape.

Shape Selection

To select one or more control points or shapes, you have various possibilities:

- To select all shapes, you can use the function Select All from the Edit menu.
- To select a single shape, you can double click either a curve or a control point.
- To select multiple shapes, you can hold the shift key while double clicking. This add the clicked shape to the current selection.
- To select a single control point, click on it. Usually, you want to select multiple points, so you can use the shift-click method here as well for multi-selections.
- To select multiple control points, you can also use rubberband selection. Drag a rectangle on the canvas, and all control points captured in the selection rectangle will be selected. If you select all control points of a shape, the shape will be selected as an entity. As always, shift-selection to maintain a previous selection is supported.
- To select a single curve segment, i.e. the two control points starting and ending the segment, just do a single click on the segment. Shift selection is possible.

Geometric Modification of Control Points

With the exception of single point manipulation, you always must have selected something for manipulation.

- Single Points
 - A single control point can be dragged around by simply clicking on it and by keeping the mouse button pressed while dragging.

You can also delete single points by either pressing delete or using the delete option from the menu bar.

- Multiple Points and Shapes

Once you have selected multiple points, no matter if by doing shift selection, multi-selection using the rubberband, click-selection of sections or doubleclick-selection of shapes, you can select the Transformation Tool from the Shape Toolbox (right of the selection arrow). The transformer will place a rectangle with handles around the selected objects.

- To move the selection, click and hold inside the transformer and drag the selection to the desired location.

- To scale the selection, drag any of the handles. While the corner handles maintain aspect ratio, dragging the side handles allows for independent scaling in horizontal and vertical direction.
- To rotate the selection, press and hold the <Alt> key while dragging a handle.

The Edit menu gives you a number of additional choices:

- Cut, Copy and Paste editing (Complete shapes only - shapes that are partially selected will be ignored). This does also work between frames and thus allows to do very quick animation or travelling matte generation.
- Deletion
- Order changes (Complete shapes only). You can determine the drawing order of shapes by pushing the selection in forward or backwards.
- Adding And Inserting Control Points
You can add or insert control points using special Shape Toolbox buttons. This works with all types of shapes or strokes. To be able to insert or add control points, you must have a single shape selected.
- Changing Curve Type
Using the remaining two buttons, you can change between polylines and Bezier curves for all kinds of shapes or strokes. As said above, for paint strokes generally you will rather want to use the Reduce function from the Shape Toolbox instead of directly converting to Bezier splines.
- Tangent Control
Once you have a Bezier spline curve, you can modify the tangents separately or together.
Note: each tangent can be manipulated separately. By holding the <ctrl> key while dragging, you can force the in and outgoing tangent to be “glued” together.

Attribute Changes

You can only change attributes for shapes completely selected. All attributes are taken from the Attribute Window. The attribute window, depending on the state of the system, either displays the Global Attributes, i.e. the attribute settings that will be used by the next draw or paint operation, or the attribute settings of a selection. The current attribute set is called the drawing context.

The top section of the Attribute Window shows the current context. There are two important fields of information here:

- Where does the attribute set displayed come from? Two possible sources:
 - The attributes window can show the global context, i.e. the attribute settings that are not connected with any existing shape

- The attribute window can show the attributes of a single selected shape.
- Where will the attributes be applied to? Three possibilities:
 - No object is selected. The attributes will be used for painting or drawing, whatever you choose to do next.
 - A single shape is selected. The attributes are applied to this shape when you render. Actually, the attributes shown are the attributes of the given shape - if one shape is selected, attribute source and target always say “Shape”, to indicate that the displayed settings were taken from a single selected shape and will be applied to a single selection.
 - Multiple shapes are selected. In this case, the “To” field gives the number of selected shapes. The attributes that are shown in the window are either the global attributes currently selected or the attributes of one of the shapes. Which one they are depends on the selection mechanism: If you select all shapes at the same time, the global attribute set is used. If you first select a single shape and you then add further shapes using shift-selection, the attributes of the first shape are used. This is a convenient method of copying attributes from one shape to another.

1.9.5 Shape Rendering

Shapes can either automatically rendered whenever you deselect either the arrow or the transformer tool by choosing the Auto Render option in the SetUp menu. (This is the default). Or set to only render when the Render command is given by turning the Auto Render option off. You can force a render by pushing the render button in the Shape Toolbox. Each time this render command is given, all vectors shapes on the screen will update.

All renders are completely reversible - all shapes are accessible as vector outlines, and when you leave the mode, your changes will be rendered to the only as a vector shape and its attributes.

1.9.6 Use Shape Storage

Vector shapes and text can be saved separately to disk with the Save As option of the File menu. They can be recalled at any time with the File>Open command. These shapes can have any paint attribute, i.e. such a saved shape can be used as a special effect filter and can be applied to any image.

Because Paint no longer works as a separate utility, there is no need to save mask or image files. The alpha channel is piped through the Reel’s effect stack. If you want to use vector shape as a mask, save it as a shape. All of its attributes, are recalled everytime you load it from the RotoPaint>File>Open menu.

If you want to make any vector shape apply to the mask, just change its attributes by selecting the shape and clicking on the Mask button in the “Apply” area of the Attributes window. For more information on vector shape attributes, see below.

All data from your paint session,. including vector information, is also stored everytime you save a Reel environment.

1.10 Text

RotoPaint allows you to create text as fully editable vector shapes in the paint mode. For further Text creation and manipulation in the Reel, see the new Text Plug In in the Version 2.6 Documentation Update.

To create text, open the text dialogue from the Window menu. The text dialogue allows you to determine the text attributes as well as to type in text in a simple editor window. The text will then be created as vector shapes on your canvas. All rules for vector shape editing apply. After creating the text, you will be in vector transform mode with the text selected and ready to be positioned.

The text dialogue consists of a font list, listing the available Postscript fonts on your system.

To the right of the font list, the text edit window can be seen. Here, you can either type text, or you can select text in any X/Motif application supporting selection and place it in the edit window using drag&drop.

In some applications, for example the SGI Shell windows, all you need to do is select the text. By then clicking in the RotoPaint text entry window with the middle mouse button you can copy the selection over to RotoPaint. The same applies to Jot, the SGI editor.

Under the font list and the text entry window, you can control font attributes. All font attributes are floating point numbers. The available attributes include:

- Size in pixels
- Angle in degree
- Alignment
- Tracking (Spacing)
- Interline Spacing (a value of 1.0 is one line)

For these fields, you can select options from option menus. You can also select a “custom” option in the menus and then type a value in the associated text field.

Finally, you can abort the operation by using Cancel or create the vector outlines using Ok.

To repeat, the vector text characters behave like normal vector shapes and can be edited in any desired way.

1.10.1 International Character Input

The RotoPaint text window behaves like a standard X application - international characters work if you have selected an appropriate keyboard layout. You can also use the X composition mechanism to create international signs with key combinations. See the UNIX manual page on “compose” for more information (open the manual page browser from the toolchest help menu and select the section X11).

1.10.2 Text File Format

You can save the state of the text window using the Save As >Text option in the File menu. Text files can also be loaded using the menu option File > Open>Text.

Text files written and understood by RotoPaint contain the following information:

```
FONTCenturySchbk SWA Normal
SIZE<value>
TRACKINGNarrow/Normal/Wide/<value>
ANGLENormal/Italic/<value>
INTERLINEAuto/<value>
ALIGNMENTLeft/Center/Right
TEXT
```

This is the text that counts - it

goes to the edit window...

The text file contains a simple header describing the text attributes currently selected. These are the font, its size, tracking, angle interline spacing and alignment. Finally, the text follows. Wherever in the example above you see the word <value>, a number could be placed. For the fields Tracking, Angle, Interline and Alignment, instead of the number *one* (and only one) of the options presented above, divided by slashes can be placed. For example, for angle the value can be either *Normal* or *Italic* or a number.

An example file might look like this:

```
FONTCenturySchbk SWA Normal
```

SIZE80

TRACKINGNormal

ANGLEItalic

INTERLINE5

ALIGNMENTCenter

TEXT

Jaleo.

Directly from the Canary Islands.

You can edit or write text files directly with any text editor. You should, however, always place the simple header with the font and format information in front. If these header lines are not present, the text file will not be read correctly.

Note that text files can contain much more text than fits on the canvas. Although this may not make too much sense for creating text rendered to the canvas, you can use this text to create vector shapes that in turn can be exported to Jaleo for shape animation as described in the next chapter.

1.11 Animation

RotoPaint supports full animation of shapes and strokes.

Note: For many effects that typically are applied to the whole image, like converting an image into impressionistic paintings etc., have a look at the AutoPaint effect in FX>ImageEffects>AutoPaint or the new, FasterWithHardware>AutoPaint found in the Fx>Plug Ins menu.

With RotoPaint animation you can:

- animate a shape or stroke moving as a whole entity over the screen and
- animate the paint process of a shape or stroke. like brush attributes, size, transparency and color, as well as the part of the vector outline that is drawn in each frame.

1.11.1 Keyframes

Shapes and strokes made in a particular frame will remain only in that frame unless they are animated. To animate a shape or stroke, first create the shape or stroke with the shape tools or the paint brush. You can do this on any frame. While the object is selected (it

must be selected *completely*), pick the Add Keyframe option from the Animation menu. Once a keyframe is set, the vector outline appears in yellow.

Move to any other frame, change the shape by moving or deforming it Note: you can NOT ADD new control points to an animated shape or stroke and fix another keyframe. Deletion of control points from a shape or stroke is possible, but the respective control point will be deleted from the object for *all* frames, not just the one selected.

It is possible to see the motion of the animated shapes when moving the Current Frame slider under the image area. You can also see the animated shape in the Reel Monitor Window by either playing through the PaintPlug effect or scrubbing across it with the Monitor cursor. You can cache the PaintPlug just like any other effect for real time playback. Note: Once you cache an effect clip you will not see any changes in the Reel Monitor Window until the cache is turned off.

A list of all keyframes set can be seen by opening the Keyframe List Window. You can also delete selected keyframes in the keyframe window.

If a shape has a keyframe set in the current frame its outline is set in yellow. You can delete keyframes by moving to the frame where the keyframe was defined (by watching for the yellow outline in the preview) and selecting the Delete Keyframe option.

The wire frame of your vector shape will automatically update as you play between the keyframes of your animation. To see a low and high resolution version of your animations you play through, make sure that the Auto Render and Small Render options are turned on in the SetUp menu.

1.11.2 Render Animation

Further control over the animation is achieved by opening the Time Editor from the Animation menu. *Note: the Time Editor and Color Chooser have slightly different parameters and menu options in Rotopaint than in Reel.* This instance of the time editor gives animation parameters for each animated shape that determine how the shape or stroke is painted over time:

- Animation
 - Start
 - Length

These two parameters determine which part of the stroke or shape will be rendered in each frame. The values are in percent of the total curve length of the vector outline. the start value determines the distance of the first point that is rendered, the length value says how much of the curve is rendered.

The start and length parameters do not have any effect if the selected shape is closed (i.e. the Close attribute in the attributes box is highlighted).

Some examples:

- Keep Start constant at 0, and animate Len from 0 to 100: Your stroke will be painted over time, at the first frame almost nothing, and each frame a little bit more. In the final animation you will see the shape drawn out over time.
 - Animate Start from 0 to 90, and keep Len on a static value of for example 10. This will move a painted piece of about 10% of the shapes length along the shape curve. Useful for special effects, like moving highlights etc.
 - Brush
 - Size
 - Opacity
 - Mask Level
- The remaining brush attributes are set as usual (for non-animated shapes) in the Attributes window.
- Color
 - RGB. The color is only used if the paint mode is Paint, Tint or Custom. Other brushes either modify the colors found in the image (Blur, Darken, Brighten, Distort, etc.) or have their own color information (Cutout).
 - Shadow Attributes
 - Offset in x and y
 - Shadow color
 - Transparency

Once a shape is animated its shadow opacity and color can only be animated in RotoPaint's Time Editor.

1.11.3 Shape Animation Using the Jaleo Reel

Shapes, created as paint strokes or using any of the other creation functions can be saved to disk. These shape files can be loaded into the Jaleo Reel. There, they can be animated. The shape files are imported into Jaleo as vector files; there is thus no quality degradation involved in animating them.

Loading a shape file in the reel is easy: Open any shape from the File>Open>Shape menu. A DVE Shape effect will be created. This is a special effect associated with vector shapes that is not available from any of the Jaleo menus.

Using the time editor, the imported shape can be animated. It can be

- moved
- scaled and

- rotated

Furthermore, as the DVE shape is rendered in the reel as an antialiased outline filled in white color on a black background, all the possibilities of Jaleo are accessible for applying live video textures, colors or anything else to the shape. It is also possible to use the shape directly as input for effects like bump, distortion, or the 3D-Displacement mapping, or to use it to control a wipe. In short, you can do everything you could do with a black and white image in Jaleo, and that is a lot.

Shapes also act as external key generators if they are wrapped around an image. The shape, then becomes the alpha channel for its input image.

1.12 The RotoPaint Menu Bar

1.12.1 The File Menu

Open

- Shape: Opens a previously saved Jaleo vector shape and places it in the canvas retaining all original position and attributes information. See the Save As Description Below
- Text: Loads a Text ASCII file into the text window. See the Save As Description Below

Save As

- Shape. Saves the currently selected shapes as a shape file. This file can later be reloaded into RotoPaint to proceed work with a session, or it can be loaded in the Jaleo reel, permitting you to do a shape animation.
- Text. Saves the current configuration of your text window to an ASCII text file. This file contains the configuration information, i.e. the current font and other attributes as well as the text you entered in the text field.

Exit

Terminates the RotoPaint interface. All current paint settings are stored in the PaintPlug effect until the interface is reopened and settings are modified.

1.12.2 The Edit Menu

Cut

Cuts out the currently selected shape(s) to the copy buffer. Cut can only be selected if one or more complete shapes are selected. Incomplete selections of shapes will be ignored.

Copy

Copies the currently selected shape(s) to the copy buffer, ready to be pasted later. Copy can only be selected if one or more complete shapes are selected. Incomplete selections of shapes will be ignored.

Paste

Pastes the copy buffer content to the canvas. This can only be done if the copy buffer is not empty. The shapes from the buffer will be copied to the canvas and the system switches to Transform mode, ready to have the copies shape positioned arbitrarily.

Delete

Deletes the current selection, no matter what it contains. A selection can be a collection of points and/or shapes.

Delete All Time

Deletes the currently selected shape or shapes through the entire duration paint effect. Use this to delete an animated shape.

Select All

Selects all shape or stroke objects on the canvas.

Select All Time

Selects every shape in every frame of the of the paint effect

Front

Puts the selected shape(s) to the very front

Forward

Pushes the selection forward one level

Back

Pushes the selection to the very back

Backward

Pushes the selection backwards one level

1.12.3 Shapes

A list of functions corresponding the Shape Tool window. The main reason for that is the possibility to have keyboard shortcuts for changing the tool. See the menu for the applicable shortcuts.

1.12.4 CutOuts

Mask, Shape, Shape/Mask

This entry is a duplication of the cutout creation functions described above.

Cutout List

Opens a window showing a list of cutouts available.

Load, Load All

Load a single cutout or a collection of cutouts from disk.

Unload, Unload All

Removes the selected cutout, or all cutouts from the list window, but leaves the cutout files on disk intact.

Delete, Delete All

Deletes the selected cutout or all cutouts from the list *and* deletes the cutout file *permanently* from the disk.

Show Mask

Show the cutout mask instead of the cutout image in the list.

1.12.5 Animate

(See the Section, Animation, above, for a description of each of the functions located in the Animate menu.)

Editor

Opens the Time Editor for manipulation of special vector animation parameters including: Start Point, Length, Brush Attributes, including color, and Shadow Attributes.

Add Key Frame All Shapes

Sets a keyframe in the animation curves for every shape in the frame, not just the currently selected shape(s).

Add Key Frame

Sets a keyframe in the animation curve for only the selected shape(s) in the frame.

Delete Key Frame

Deletes a key frame in the animation curve for the selected shape(s). You must be positioned on a key frame that has already been added. To determine if you are positioned on a keyframe, scrub through the animation, the vector shape will turn yellow as each key frame passes. You can also use the keyframe list window (see below).

Key Frame List

Opens a window displaying a separate key frame list for each animated shape. To recall the key frame list for a specific shape, double click on the shape. Each shape can have a separate animation curve.

Auto Fix

Automatically places a new key frame in the animation every time an adjustment is made, this function will operate only after the first key frame has been added.

Interpolation Type

Defines the type of animation curve, linear or spline.

Show Path

Places a graphic outline of the animation path on the canvas. The path will update each time a new key frame is added or modified.

1.12.6 Shuttle

Contains functions for preview playback of the processed clips.

1.12.7 Windows

Opens the auxiliary windows of RotoPaint. The windows themselves are described elsewhere in the manual.

Shape

The window for vector creation and edit tools

Attributes

The current brush attributes, with the exception of color.

Colors

The Color Window.

- Features

- *Color Chooser*

RotoPaint uses a similar Color Chooser to the one found in the Time Editor. It sports a color wheel, color solders for RGB and HSV, and a color store area that you can use to put store a number of colors. The different control areas can be shown or hidden independently.

- *Pick Color*

The color chooser has a Pick Color button, permitting you to get any screen color in the selection field. After pressing the Pick Color button, the color under the cursor whenever you press the mouse button the next time is chosen as the current color. The color pick is not restricted to Jaleo windows; you can click on the whole workstation screen, wherever you like, in- or outside of Jaleo windows.

- *Color Store*

The Color Store is a grid of storage bins for colors. By default, it contains a set of primary colors and a large number of free storage cells.

To put the current color into a free cell, just click on the cell. To edit the content of a cell, double click on it and adjust the colors with the controls. When you are done with adjusting colors for the cell, click again to stop changing the cell color, or double click on another one.

- *WYSIWYG Mode*

Furthermore, the color chooser has a “what-you-see-is-what-you-get” mode, applicable to the RGB and HSV slider modes. In WYSIWYG mode, the sliders do not show gradients of primary colors (RGB) or the color rainbow and saturation/luminance gradients (HSV), but the color you will get if you move the respective slider to that position. That is, you can see without moving a slider which color you will get as a result if you would move one.

- *Current Color Boxes*

Also the color chooser can be used now to set independent foreground, background and shadow colors (RotoPaint only). On top of the color chooser window you can find three fields representing the current background, foreground and shadow color. The color chooser controls adjust the selected color, by default the foreground color. To adjust another one, just click on the display field.

Text

The vector text edit window. For a further description of this function, see the Text section above.

1.12.8 The Zoom Menu

Zoom In

Zooms into the image, showing you a magnified part of the canvas content.

Zoom Out

Zooms out, i.e. showing you the canvas with a lower magnification level.

Reset

Reset the magnification to one.

Center

Center the image on screen.

1.12.9 The Setup Menu

Composite

A new option has been added to the SetUp menu. Composite allows you to see a composite of RotoPaint's Background (Input1) and Foreground (Input2) image. This is extremely useful for painting garbage mattes. While the Composite function is active, the composited image can be seen in both the Canvas and Reel monitor windows. The alpha channel visible in the Mask view will continue to be piped through the Paint effect.

Shadow in Back

Allows you to set the mode for shadow drawing. By default, shadows are drawn just immediately before their associated master object is drawn. If the Shadow In Back option is selected, all shadows are drawn first on the background, then master objects are drawn in the proper order.

Auto Render

Automatically renders the High Resolution vector images in the animation each time you stop at a frame in the animation. The default mode of this parameter is on. If you do not use this mode, you will only see a wireframe representation of your work.

Small Render

Automatically renders the Low Resolution vector images in the animation as you scrub through the animated frames. The default mode of this parameter is on.

Set Options

Opens the Set Options window

- Features

- *Grid*

The setup for the grid has been moved to a different menu entry – it is now called Set Options. As before, grid size can be specified in two text boxes for x and y. Grid offset, before also controlled using text fields, is now controlled by sliders, allowing you to interactively adjust the grid by dragging the sliders.

- *Mask Display Transparency*

In the option setup dialogue box, there is a slider to set the mask display transparency. A fully opaque mask obstructs the actual scene beneath it. For this reason, the mask display transparency can be adjusted. Note that this does NOT change the values in the mask – it only changes the way values are shown on screen.

- *Mix Blend*

Sets the amount of blending between the foreground and background inputs when the Mix button is turned on. The default value is a 50% mix between both, a value of (0) displays the foreground only, a value of (100) displays the background only. See the section on Mix, above, for a full description of this function.

- *Shapes Colors*

Defines the colors for the various points used in vector shape creation. These are: Point, Shape, Transform, Set Point, Key Frame, and Set Box. Colors are user definable to help separate shapes from the background. To change a color, select one from the color selector and click appropriate button. To restore the default colors for each box, click the Reset Colors button

Snap Grid

Forces all operations to be snapped to the drawing grid.

Auto Select

When turned on, automatically selects the last shape you created, to be used with modification tools, like transform or delete.

Clear Mask

This option, when activated, forces the matte of each frame to be fully transparent regardless of the alpha channel associated with the foreground image. As clips loaded in Jaleo without a mask appear with a fully opaque mask Clear mask should be turned on if you want to use the image for compositing. From here you can create a new alpha with the mask features found in Rotopaint.

Use Tablet

Enables tablet pressure mode. Note: While cursor movement control is possible with all SGI-supported tablets, for pressure, you currently must have a Wacom tablet with the newest Wacom driver for SGI installed. Please contact Wacom for more information.

2. The Morph Plug In

Jaleo's new morph plug in is a mesh based warp effect using keyframe animation. Depending on the number of inputs to the effect, it can either warp a single image or create a morph between two images. Morph takes advantage of SGI's rendering hardware for quicker processing of images. If hardware is not present, however, the effect will automatically switch to software rendering. The morph plugin can be applied to any clip or effect stack in the Reel just like all Jaleo's effects.

Note: When rendering with hardware, use the Fast Hardware or Novice Modes located in the Reel Monitor menu to make sure the full screen remains unobstructed rendering. For more information on these options see the New Reel Monitor Modes for Hardware Rendering in the Version 2.6 Documentation Update.

2.1 Applying the Morph Effect

Select the clip or clips that you want to warp or morph, then choose the Morph effect from the Fx menu.

Menu Location

Fx>Plug Ins>MorphedPainted Titled>Morph

Inputs

Morph can have either one or two inputs. If there is only one input the effect will create an animated warp on that image. If there are two inputs, the effect will create a morph between them.

- Input 1: With only one input, this is both the Source (A) and Target (B) image of a warp. With two inputs, input one is the Source (A) image of a morph.
- Input 2: The Target (B) image of a morph effect.

Outputs

- Image: The composite image of either the warp or morph effect.
- Mask: A either the single effected alpha for the Warp or a combined alpha of Source and Target for the Morph.

2.2 The Morph Window

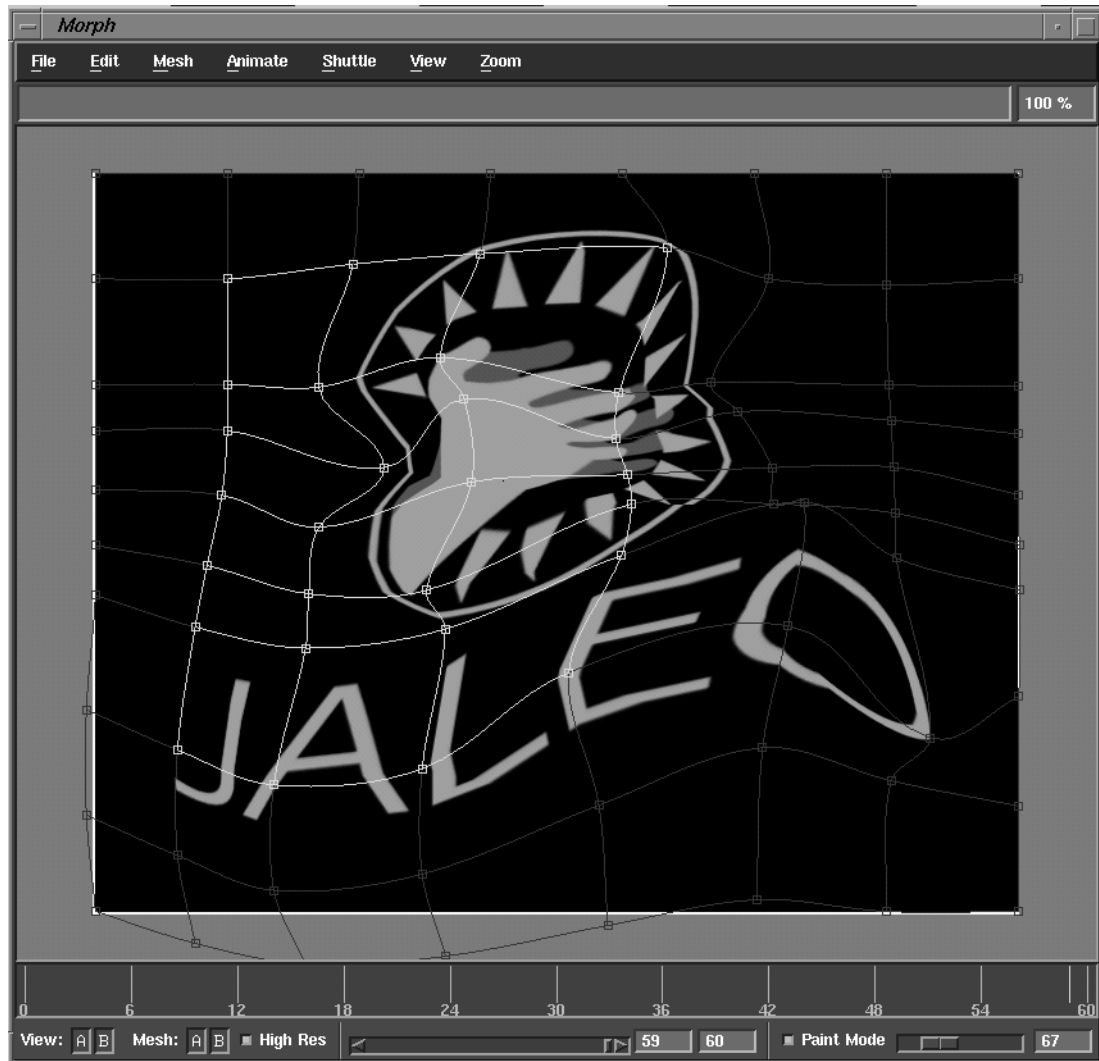


Figure 7. The Morph Monitor

The Morph view window has three distinct areas of operation. At the top is a menu bar, in the middle a large screen image view with a mesh grid, and at the bottom a time line displaying the length of the effect and various buttons for view selection and paint brush size.

2.2.1 The Morph Menu Bar

The menu bar contains various operations and functions that you use in creating a warp or morph. These menus, like all of most of Jaleo's menus can be torn off for repeated use by clicking on the broken line at the top.

File

The file menu offers two options for saving or loading meshes. Meshes are stored in the Shape directory of your project. They are given a .msh extension.

Edit

- **Selection Tools:** The edit menu gives you four choices for the selection of mesh points:
 - **Select All:**
Selects all un-dimmed control points in the mesh.
 - **Deselect All:**
Deselects all un-dimmed control points in the mesh.
 - **Select Row:**
Selects all rows with highlighted control points.
If multiple rows are selected, the next operation will be applied to the Bottom most row.
 - **Select Column:**
Selects all columns with highlighted control points.
If multiple columns are selected, the next operation will be applied to the Left most column.

*Additionally, pressing **Alt** while double clicking a point selects the full column, pressing **Ctrl** while double clicking on a point selects the entire line.*

- **Set Auto Tangent:** Restores the tangents of the selected crosspoint(s) in their default positions and modes.

Mesh

- **Insert Line:** Adds a copy of the currently selected line directly on top of it. The new line will be white and can be moved, in perspective along the warp, to any part of the mesh.
- **Delete Line:** Deletes a selected line
- **Dim/Undim Mesh:** Dims/Undims the unselected part of the mesh. This is useful in isolating the areas to define the morph.
- **Copy A>B/B>A:** Copies the mesh from one source to the target sides or vice versa.
- **Reset A/B/All:** Resets the mesh to its default grid
- **New Mesh Size:** Defines the number of rows and columns in the mesh grid. Use this for adding more control points in the mesh. The default number for both is 8. This should be set before any work is done on the effect and not changed.

Animate

Animate offers various options for animating key frames along the mesh curve.

- **Insert/Delete Key Frame:** Places or Deletes a key frame in the mesh animation curve at the current frame. The current frame number can be seen in the left numeric field at the bottom of the window. This frame can be set by entering a number in the field.

There is also a yellow line is positioned at the current frame in the time line. You can add key frames to either the source or target mesh grids, depending on which mesh is selected with the mesh view buttons.

Unless the Auto Fix option (*See below*) is turned, you must insert a keyframe to update the animation. When you insert a keyframe in the Source(A) mesh, a red matchstick will appear at the top of the time line. A green matchstick will appear in the bottom of the time line when you insert a key frame in the Target(B) mesh. Matchsticks can be graphically moved to another part of the time line by clicking and dragging.

Note: when meshes A and B are selected they are not editable.

- **Copy Keys:** Copies the key frames from one mesh animation to the other.
- **Reset A/B/All:** Resets all key frames to their in the respective mesh animation curves to their default values.
- **Auto Fix:** When this is turned on a key frame will automatically be set or updated everytime you make a change in the mesh.

Shuttle

Offers a number of playback functions and their respective keyboard shortcuts.

View

Toggles on/off the various mesh elements: Points, Lines, Tangents, and Patch. Patch will show a finer subdivision of the mesh.

Zoom

Contains zoom operations for the image screen and their respective hotkeys.

*(Note the screen can be scrolled by pressing the **Ctrl +Alt** keys while clicking and dragging with the **left mouse** button, just like in Paint.)*

2.3 The Mesh

The mesh is series of vertical and horizontal lines which appear across the morph screen. *The number of lines and columns can be adjusted with the New Mesh Size option in the Mesh Menu.* At the intersection of the lines, is a crosspoint. All warp functions are performed by animating these mesh crosspoints, in effect pulling various areas of the image from one point to another. There are two sides to the mesh: The Source, or side A, and the Target, or side B. If you are warping a single image, the same image will be used for both Source and Target. If you are morphing between two inputs, input one is the Source and Input two is the Target image.

2.4 The Scroll Bar



Figure 8. Morph Animation Tools

The scroll bar, located at the bottom, middle of the screen, scrubs through the effect time line. Click and drag on the middle button to move through the scene, or press the arrow buttons on either side to move frame by frame.

The View Buttons

The View Buttons at the bottom left of the Morph Window determine which images or meshes from the Source(A), Target(B) or Both(A/B) are visible on the Morph screen. They also determine to which mesh operations will apply.

(Note: When both meshes are selected no operations can be applied. This is only for pre-viewing operations between Source and Target.)

2.5 Further Control with Mesh Manipulators.

2.5.1 Mesh Size

To create a finer grid with more control points, adjust the New Mesh Size parameter in the Mesh Window. Lines and columns can be added independently. Be sure to set Mesh Size at the start of the session.

2.5.2 Tangents

To adjust the curve of the grid lines use their respective tangent controls. Tangents are lines with handles used to adjust the angle of a curve between crosspoints. In the mesh there are four tangent handles one for each side of the intersection. These can be seen by selecting the Tangent option in the View menu.

All tangents in the mesh are independent, which means you can move one side of the curve without affecting the other tangents. To change a curve angle, select a crosspoint and drag on one of the tangent controls. The tangents can be reset to their default position by selecting Set Auto Tangent from the Edit menu. All tangent curves will be shown in the warp animation.

At start time, tangents are in a default auto mode which means they are computed in relationship to the centerpoint position. At any time you can break this mode by adjusting one of the tangents. The tangent will move freely as the control point is moved.

2.5.3 The Paint Mode Button

At the lower right part of the screen is a button labelled Paint Mode. When activated, this enables a much larger radius for selecting and dragging the mesh, much like a paint brush. In the Paint mode you do not need to select a point. You can click anywhere and the closest mesh points will move as you drag. The radius of the selection area is defined by the number in the numeric entry box to the right. Its size can be adjusted with the adjacent slider tool.

2.6 Using the Time Editor to Adjust Dissolve and Animation Rates

There are three parameters in the Time Editor which apply to the Morph effect:

- **Grade:** Defines the curve of the mesh animation. Its default is a linear curve from the Source (0) to the Target (100).
- **Mix:** Defines the curve of the dissolve between the Source and Target images. Default is a linear curve.
- **Subdivisions:** Defines the number of polygons which will be used in the warp. Use a value of 1 to 4. *Note: A higher value will slow the rendering process as there are more polygons to for the machine to calculate.*

You may want to experiment with the Grade and Mix curves to get the most desirable combination of warp and dissolve in the morph effect.

2.7 Creating a Warp

Begin by setting up the Reel and Time Editor.

- The Morph Plug In will need only one input for this. Apply the effect icon to one clip in the reel.
- To open the Morph interface, choose Time Editor's Plug In from the View menu

The warp animation needs two mesh configurations to create its displacement: A Source Mesh (A) and a Target Mesh (B). The crosspoints in the grid animate between these two meshes to create a distortion effect. The Source crosspoints can be placed anywhere in this mesh without affecting the image because The Source(A) mesh only defines the starting points for the animation- (which points of the image will move at the beginning of the warp animation.)

- Begin by viewing only the Source(A) image and the Source(A) mesh. Select only the A buttons in the lower left view area. The Source mesh will be red in color. At this point, you can choose to either to leave the mesh as it stands, creating the warp from the crosspoints current positions, or you can choose to move the crosspoints to for different warp reference points. To change the mesh, click and drag on one of its intersecting points. Notice that the image is not affected by as you change the position.
- Switch to the Target(B) image and Target(B) mesh. Select only the B buttons in the lower left view area. This will be the end point of the warp effect. Make sure that only the B buttons are pressed. The mesh color will change from red to green. Now, click and drag on the mesh cross points. You should see a distortion in the image as you move the crosspoints.
- Now select both A and B for the image and mesh views. The mesh color will turn yellow. This allows for a preview of the warp animation.

With both the A and B image and mesh views active, (select Both(A/B) buttons in View and Mesh area) scrub through the effect by clicking and dragging on the scroll bar middle button. If you want to step through the warp, use the arrow buttons to the right and left.

(Note The image can also be scrubbed through in the Reel, by dragging the red clip cursor in the Morph clip with the middle mouse button, but this will not initiate the mesh animation.)

Animating the Warp Using the Time Line.

- To begin an animation, select the mesh B using the Mesh View Button. Move to the desired frame number in the scene with the scroll bar, or by typing a number in the frame reference box next to the scroll bar. Then, select Insert Key Frame from the

Animate menu. If you are animating with the A mesh, a red matchstick will appear in the timeline at the current frame. These matchsticks can be repositioned in the time line by clicking and dragging. To insert a second key frame move to a new position in the scene, modify the mesh and choose Insert Key Frame again.

Note: If the Auto Fix option in the Animate menu is active, a new or updated key frame will occur every time you make an adjustment in the mesh.

- Remember that all animation is occurring in relationship to the Source/Target mesh curve. The Target Mesh always moves in relation to the Source Mesh. To preview the animation, select both the A and B view buttons for image and mesh and scrub through with the scroll bar.
- Key frames can be moved, copied, reset or deleted using the Animate menu. *For a further description of these functions see the Animate Menu above.*

2.7.1 Creating a Morph

It is recommended that you complete the Creating a Warp exercise above to understand some of the basic mesh animation tools before doing this exercise.

The Morph effect operates on the same principle as Warp effect, with the exception that there are two image inputs. Input one becomes the Source (A) side. This is the image you are morphing from. Image two becomes the Target (B) side. This is the image you are morphing to. In between the two is an warp animation defined by the control points in the Source/Target meshes. At the same time, a dissolve takes place between image one and image 2. Pretty simple, right?

Let's make one.

- Begin by setting up the effect stack in the reel. Select two images: a Source(A) and Target(B) image for the morph. Layer them one on top of the other, the bottom being the Target image. Apply the Morph Plug In effect around both of these clips and adjust it to size. input one and input 2. *Trick: Select the bottom image clip then choose the effect from the menu, Jaleo places it in the Reel directly on top of the selected clip. Now, just drag the effect up one layer.*
- Call up the Morph interface by selecting Plug In from the Time Editor's View menu.
- First position the mesh for your Source Image. *See above for a discussion for viewing and adjusting the Source and Target meshes.* Select an area of the Source image that you want to morph from. If you want you can add more warp control points with the New Mesh Size or Insert Line options from the Mesh menu. See above. To select an area of the mesh drag across the area with the select rubberband and let go. Now, dim the rest of the mesh using the Dim Mesh option in the Mesh menu. Only the selected

points are highlighted. Position them around the perimeter of the area you want to morph. Adjust the lines curves with the tangent controls. *See Tangents above.* You want a mesh that conforms to the shape of your morphed object.

- Next position the mesh for your Target image. Select the B side of the Mesh and Image view. You will notice that the grid is dimmed in the same crosspoint configuration as the Source mesh. Now, Position adjust the highlighted crosspoints and line curves to the perimeter of your Target object.

(Hint: Sometimes it is easier to view only the Points when first placing them, then turn on the Lines and Tangents to adjust the line curves.)

- To preview the morph, select both the A and B image and mesh views and scrub through the animation with the scroll bar. Adjust either mesh as desired.
- You may also animate key frames for each both the Source and Target meshes. *See Animation above.*

Alpha channels are also affected by the Morph and Warp effect to and can be used to add morphed images to a composite stack.