Studio Artist™

Graphics Synthesizer

from

Synthetik

Version 1.0

User's Guide

This User's Guide is the official reference for Studio Artist 1.0.

Studio Artist User's Guide by John Dalton with assistance by Candice Pacheco and Tom Dimuzio.

Studio Artist application by John Dalton.

Special thanks beyond the call of duty to Candice Pacheco.

Thanks to Steve Campbell, Tom Dimuzio, Ann Dimuzio, Vance Galloway, Julia Kay, Nina Paley, Scott Rawlings, Josh Rosen, Atau Tanaka, and everyone else who contributed their time and talent.

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(Please be near your computer with Studio Artist running, and have your serial number, printed on the CD Sleeve, ready when you contact Technical Support.)

Table of Contents

Welcome to Synthetik Studio Artist!

As a new Studio Artist user, we just wanted to take a few minutes to welcome you to the Synthetik user base and tell you a little about our company. Synthetik's mission is to develop innovative software tools for computer artists and creative professionals.

We're trying to tread new ground and create tools that are unique, innovative, and different from existing software for computer artists. Unlike many companies that have abandoned computer art to focus on graphics business applications, our primary focus is to help expand your range of artistic and creative possibilities.

Studio Artist is unique in several different ways. First, it takes many work metaphors that have existed in the computer music and audio world and incorporates them into a painting and image processing program.

Musicians have used audio synthesizers for many years to generate complex sounds and arrangements. Studio Artist can be though of as a graphics synthesizer. An individual can generate an unlimited number of graphics patches. These patches can be anything from a paint brush or paint type to complex graphical processes that can emulate traditional graphics arts techniques or produce a totally new visual look.

The factory patches shipped with the program barely scratch the surface of the potential possible visual looks and art processes that can be created within the program. The immense flexibility of the program also allows artists to create their own art tools or processes with unique visual looks based on their own personal tastes. For example, if you don't like our watercolor brushes, you can make your own.

Synthetik is also unique among many companies in that we are dedicated to creating innovative software that is affordable by individuals. Artist contains some features that are currently only available in software costing thousands of dollars. We feel that the most compelling work is created by individuals. That's why we've brought you features that you would have to spend thousands of dollars to get in other software packages as well as additional features unavailable before at any price.

For many years we've been interested in the relationship between artistic representation and how our brains internally represent visual images that we see in the world. Studio Artist is the first commercial program for computer artists that incorporates research results from cognitive neuroscience investigations into the nature of visual perception in the brain. What this allows us to do is

to provide intelligent assisted drawing capabilities.

What does this mean for you as a user of the program? Artist understands something about how drawings are made and perceived. If you don't know how to draw, Studio Artist can help you by drawing for you. You can work to direct it's activity at a much higher level than drawing individual lines.

But wait you say, I already know how to draw. That's OK, because you can still use Intelligent-Assisted™ drawing to help you with repetitive or complex drawing tasks, or to create new visual looks. In addition to being a creative tool, this feature can also help you reduce the use of repetitive mouse or pen movements that can lead to problems like carpal tunnel syndrome. Try out the auto crosshatching and you may never do it manually again.

We're extremely interested in getting feedback from users about what they like, don't like, would like to see added or done differently, etc. You can have the unique opportunity to see your feature suggestions quickly incorporated into the program. Don't hesitate to become a part of the design process.

You can reach us via email at techsupport@synthetik.com.

We look forward to hearing from you!

Chapter 1: Getting Started

Studio Artist is a smart painting, drawing and video processing program which includes:

Unlimited User Editable Natural to Out-of-this-World Paints

Intelligent-Assisted Painting and Drawing

Resolution Independent Raster Painting with Vector Editing

A Complete Image Processing Effects Suite

Auto Rotoscoping and Video Effects Processing

Real-time Warping

Dynamic Kaleidoscope and Symmetry Effects

Full use of the Advanced Features of Wacom's Intuos Graphics Tablets

Unique Interactive Magic Wand Region Selection

Record, Edit and Playback of Paint Action Sequences

Unlimited Keyframe Paint Animation

Morphing

The World's First Graphics Synthesizer

Musicians have used music synthesizers for many years. **Studio Artist** takes metaphors from music synthesis and applies those metaphors to interactive painting, graphics and photo manipulation.

Unlike other paint programs with a small number of editable parameters, Studio Artist 's Graphics Synthesizer module has literally hundreds of editable controls. This kind of control enables Studio Artist to produce unlimited lush dynamic and complex paints while allowing for the randomness or happy accidents of real art materials. But realistic oil, chalk , watercolor or wet paints are only a part of the picture. Studio Artist travels way beyond the world of natural media and into the realm of **Wow**! Watch paint brushes interact with a virtual canvas to create truly unique paintings, drawings and processed video.

Intelligent-Assisted drawing

Studio Artist can automatically paint and draw based on built-in intelligent visual perception modules. A touch of a button can start Artist's Paint Actions. Studio Artist examines the source image, then automatically draws or paints it in the style of the user's choosing.

The user can choose to interactively navigate through the creative process with Studio Artist or let Artist do all the work. Whatever the user's skill, Artist can Intelligently-Assist in achieving a much greater level of expression.

The complexity of Raster paint with the editability of Vector paths

Studio Artist uses a unique hybrid graphics model that combines the complexity and richness of Raster paint with the editability of Vector paths. Drawings and paintings can be edited using Bezier curves after the fact. Paintings can be designed at low resolution and then rerendered at higher resolution with added detail.

Extensive Interactivity

Artist takes full advantage of all of the advanced features of the awesome Wacom Intuos Graphics Tablets. Go wild! The user can interactively modulate hundreds of paint parameters in real time using

Wacom's pressure sensitive pens, air brush tools, 4D mouse, tilt and pressure modulation. Watch delicious tilt and pressure sensitive wet paints magically flow over the canvas.

Auto Rotoscoping

Studio Artist can autopaint or rotoscope QuickTime video frame by frame automatically. Design a series of paint and image processing operations and then let Artist automatically generate a hand-painted and/or processed video sequence.

Vector-based warping and morphing

Design vector-based unlimited keyframe image warps, morphs, or video feedback effects that can be saved as QuickTime moves. Warp, stretch, and mutilate images in real time using a pressure sensitive pen.

Image Processing

Studio Artist has a full range of image processing filters and unique visual effects. Custom art processes can be designed that combine paint operations and image processing filters as Paint Action sequences.

Overview

Studio Artist is based around the metaphor of a graphics synthesizer. A user can construct graphical patches that allow for an unlimited number of potential visual looks. This overview will help you understand the structure of the program so that you can quickly start modifying preset patches as well as create your own.

First, some terminology. Most of the screen real estate is taken up by the working Canvas, located on the right hand side of the main Studio

Artist window. The "**Canvas**" is the image you are painting, editing, manipulating, etc. The "**Source**" is located in the top left corner of the screen, and is the source of the visual attributes used by the program for intelligent-assisted drawing.

What is a visual attribute? Studio Artist understands something about visual representation of images, and is always trying to use this information to aid in drawing or painting. We call this Intelligent-Assisted™ drawing, and the results may be subtle or "in-your-face" depending on the current paint settings of the program.

Unlike other painting programs, there is always a Source as well as a Canvas in Studio Artist. The Source is responsible for much of the visual complexity of the resulting painted images. This is much more complex then what has traditionally been called cloning in other programs, and the uses of the Source are consequently much more varied than these other programs.

"But I hate representational painting," you may say. "Why do I have to choose a Source." The answer is that you don't have to choose a representational image. You might choose your source for it's textures, colors, or some other desired visual attribute. Or, you can ignore the Source and manually control all aspects of color selection and drawing as desired.

The program has a number of categories of modal interaction with the paint canvas. These categories of interaction are referred to as **Operations**. Interaction may be through an automatic "**Action**", or one or more interactive "**Mouse Modes**". The user can choose the desired type of interaction (Category and associated Mouse Modes) with popups located directly below the source image in the top left corner of the interface.

Users can navigate through a hierarchy of control panes to edit parameters associated with the current Operation. Individual parameter panes are accessed by using text popups associated with each pane. A complete collection of parameters is called a Patch.

All of the nested control panes can also be accessed directly via the

Operation menu located in the main menu bar.

Control panels are associated with the following types of modal interaction or Operation categories:

Paint Synthesizer

Allows a user to edit parameters associated with painting or interactive drawing. Painting can be user directed via a mouse or pressure sensitive tablet, or automatic through Intelligent-Assisted™ drawing, or a hybrid combination of the two techniques. There are a large number of editable and modulatable parameters that control the look and feel of the paint.

All interactive painting can be edited with vector paths and then redrawn as Raster paint. Painting actions can also be recorded as a History Sequence and later rerendered at different resolutions.

Presets

Allows a user to access Presets. Presets are a pre-edited set of paint parameters. There are three types of presets.

A "**Paint Patch**" is a complete set of Auto Paint Synthesizer parameters.

A "**Paint Action Sequence**" is a series of Actions that can include things like auto-painting, image processing operations, interactive warps, layer transformations, etc.

A "**Workspace**" is a collection of all of the Studio Artist parameter memories as well as additional information about window locations and configuration. The parameter memories recorded in a Workspace include the current Paint , Paint Preset, Paint Action Preset, Color, and Bezier memories. Importing and Exporting Workspaces allows you to switch between sets of these memories, which you can configure for different tasks.

Image Operations

Allows a user to perform a large number of different image processing operations on the paint canvas. Each image processing operation also

includes extensive compositing options which can be used to dramatically change the operation's resulting visual effect. Iterative or repetitive operations can also be defined.

Bezier Drawing and Editing

Allows the user to draw and edit Bezier paths. All interactive Raster drawing operations within Studio Artist can be recorded as Bezier paths for later Vector editing. The edited vector paths can then be redrawn with Raster Paint.

Bezier paths can be generated on the fly from the Canvas or Source Images. Collections of Bezier paths can be used to define path drawing in the Paint Synthesizer. Bezier paths can also be recorded as keyframes for subsequent animation over time using the Keyframe Timeline.

Region Selection

Allows the user to interactively define area selection regions based on image or canvas visual attributes, or by hand painting a mask. These regions can be used for masking of other Actions within the program, or for Paint Fill Actions.

Interactive Warp

Allows the user to dynamically warp, flip, move, or rotate the canvas image in a variety of different ways.

Timeline Animation

Allows for keyframe paint animation or warping or morphing based on editable Bezier paths. Animation can be output frame by frame as a QuickTime movie. Separate sets of animation keyframes can be associated with each Canvas Layer.

All modal Operations can be performed on a static Canvas with unlimited Layers, or on the individual frames of a QuickTime movie. Movies can be loaded into RAM for uncompressed editing and playback.

System Requirements

- Power Macintosh with 32 MB of RAM or more
- System version must be 8.0 or higher.
- QuickTime 3.0 or higher.

Note:

You can adjust Studio Artist's memory allocation (via the Get Info dialog in the Macintosh Finder). Select the **Studio Artist 1.0** application icon in the Finder and use the "**File : Get Info...**" menu command. Depending on the amount of memory in your Macintosh, you may need to adjust the factory default memory allocation.

The more memory you can allocate to Studio Artist, the better. This is particularly true if you plan to work with uncompressed RAM movies, which are very memory intensive. The maximum size of Studio Artist's working Canvas will also depend on the amount of memory you allocate to the application.

Synthetik does not recommend using virtual memory with Studio Artist. We recommend that you turn off virtual memory in the Memory Control Panel, accessed via the Control Panels menu in the Apple main menu.

Navigating the Modal Operations and their Control Panes

At it's highest level, the program has a number of categories of modal interaction with the Canvas. The desired type of modal interaction or Operation and it's associated control parameter panes are accessed with popups located directly below the Source Image in the top left corner of the interface.

Users can navigate through a nested hierarchy of control panes to edit parameters associated with the current Operation. Individual parameter panes are accessed by using text popups associated with each pane.

Studio Artist provides shortcuts via the **Operation** menu to access the various control panes associated with the different modal operations. For example, choosing "**Region Selection:Lasso**" from the **Operation** main menu would immediately switch the control pane to **Region Selection** and allow **Lasso** selection via the mouse in the main Canvas.

Studio Artist Windows

Studio Artist is primarily designed around one main control and drawing window. Auxiliary functions primarily associated with lists of actions or layers that interact with the main controls are accessed from several floating windows.

You can choose in the "**File : Preferences...**" menu command dialog to split off the control surfaces from the main Studio Artist window as two additional floating control windows. This may be desirable for users with more than one monitor. The two control windows will automatically split to sperate floating windows if you have an older 640 x 480 color monitor.

Main Drawing and Editing Window

Most of the editing and drawing is performed within the main Studio Artist window. Control strips run along the left side and the top of the main Studio Artist window. The working Canvas takes up most of the right hand side of the screen.

Source Area

The top left corner of the main Studio Artist window is the Source area. A small representation of the Source Image is displayed there.

The source display can be switched from the **Source Image** to **Source Color,** which allows for user specification of color from a color picker. When the Source Image is active, the initial paint color source is cloned directly from the Source Image. When the Source Color picker is active, the initial paint color source is the user selected picker color.

Several memory icons are also next to the source display. Memory icons are used throughout the Studio Artist interface to provide easy storage and playback of any editable parameters. Memory icons always work the same way. You Option-click them to record new parameters into the memory, you click them to play back the recorded parameters into the working controls.

The colored squares are color memories, and can be used to store and switch between paint colors while working. The three rows of four memory icons store Paint Synthesizer patch parameters. The first row of four Patch Memories stores paint Synthesizer parameters associated with Paths. The second row of four Patch Memories stores Paint Synthesizer parameters associated with Paint and the Paint Brush. The bottom row of four Paint Memories stores complete Paint Synthesizer Patches.

These Paint Synthesizer Patch memories can be used to store favorite Paint Synthesizer settings for easy access while working, or as working buffers while editing Paint Patches to store your intermediate editing work, or to easily compare different Patches or Patch edits on the fly.

Operation Control Area

Below the Source Area on the left side of the main Studio Artist window is the Operation control area. A hierarchial series of Operation control panes with sets of individually editable parameters can be navigated by popup controls. Individual control panes can also be accessed directly by using the Operation main menu.

Each control parameter is edited via a collection of interactive controls. Numerical parameters can be edited with slider controls or their associated text edit fields. Non-numeric parameters can be edited with

popups or checkboxes.

Working Canvas

The working Canvas takes up most of the main Studio Artist window. This is where you interactively paint with a mouse or pressure sensitive pen or airbrush tool. The Canvas is where the various Operation Actions are performed. All of Studio Artist's visual editing and art creation takes place in the Canvas.

Canvas Control Strips

Two horizontal control strips reside above the working Canvas on the right side of the main window. The top control strip contains a popup to control masking with the current region selection. It also contains controls to work with RAM movies loaded into the Canvas. These controls will be inactive until a movie is loaded.

The second horizontal control surface contains popups to change the current Mouse Mode for a particular modal Operation, and a popup to change the Canvas Background. Two eraser buttons are to the left of the Background popup. The first erase button to the left replaces the current Canvas with the specified Background. The second erase button is a complete eraser. It erases the current Canvas to the specified Background, erases any paths in the current path buffer, and erases the Blanking frame, which is a hidden frame buffer used by the Paint Synthesizer to keep track of where you have previously drawn, or for certain special visual effects.

The two buttons directly above the Canvas vertical slider bar are used to zoom the current view in or out of the Canvas. The numeric indicator directly to the left of these two zoom buttons indicates the current zoom ratio. A display of 1 means a 1:1 view ratio (ie. no magnification). A display of 2 means a 2:1 magnification. A display of 1/2 means the view is 1/2 the size of the actual Canvas.

There are also four Bezier path memories located in the Canvas Control Strip. These memories can be used to record and playback of

complete sets of Bezier paths. The contents of these memories can also be accessed by the Paint Synthesizer to define various autopath generation operations. Like all memories in Studio Artist, you Option-click to record the current Bezier path frame into the memory and click to replace the current Bezier path frame with the contents of the memory.

For example, a Bezier path cross hatch pattern composed of several vector paths could be recorded into one of the Bezier path memories. A Paint Synthesizer patch could then be built that would use the recorded vector crosshatch paths as a source for interactive drawing under the control of the mouse or pen.

Installing Studio Artist on your Hard Disk

Although you can run Studio Artist directly from the CD-Rom, you should install it on your hard disk for maximum performance and utility.

1. Drag the Synthetik Studio Artist 1.0 folder from the CD-Rom onto your hard disk. This will copy the Studio Artist application as well as the various Preset folders that need to reside next to the application.

Studio Artist looks for paint presets in a 'Preset' folder located next to the application. Studio Artist looks for Paint Action Sequence Presets in the 'PASeq' folder located next to the application. Studio Artist looks for Workspace presets in the 'Workspace' folder located next to the application. Studio Artist looks for image brushes and movie brushes associated with Presets in the 'Brush' folder located next to the application.

2. Studio Artist needs QuickTime 3.0 or greater to be installed on your Macintosh in order to run properly. A QuickTime 4.0 installer is included on the CD-ROM in case you need to install or upgrade QuickTime. Double click on the QuickTime 4.0 installer and follow it's instructions if you need to install QuickTime.

3. You can adjust Studio Artist's memory allocation (via the Get Info dialog in the Macintosh Finder). Select the **Studio Artist 1.0** application icon in the Finder and use the "**File : Get Info...**" menu command. Depending on the amount of memory in your Macintosh, you may need to adjust the factory default memory allocation.

The more memory you can allocate to Studio Artist, the better. This is particularly true if you plan to work with uncompressed RAM movies, which are very memory intensive. The maximum size of Studio Artist's working Canvas will also depend on the amount of memory you allocate to the application.

Quick Start

Ok, you hate manuals and just want to get started painting. Here's how to get started quickly.

1. Double-click on the Studio Artist application icon. A standard file dialog will come up and you should select the Source Image you wish to work with. Then, a dialog will come up that allows you to specify the working Canvas size. Typically, you might choose a Canvas size different then the original Source Image. The Source Image is not modified in any way. The Canvas Image will be the final output image.

2. After you click **OK** in the Set Canvas Size dialog, the cursor will spin for a short period of time while Studio Artist examines your Source Image. Then, the main Studio Artist Canvas window will appear. Studio Artist boots into the Paint Preset Operation control pane.

3. Use the mouse or pressure sensitive pen to start drawing into the Canvas. Or, click the **Action** button to watch Studio Artist autopaint without any manual assistance.

4. To change the current Paint Patch Preset, either click on one of the colored Paint patch Preset icons in the control surface on the left side of the main Canvas window, or use the **Category** and **Patch** popups to choose a preset by category and name. Every time you change to a new Paint Patch Preset, the look and feel of the current paint tool will totally change. Working your way through the various Paint Patch Presets (there are over 600 included with the application to get you started) will give you a feel for the unlimited range of potential visual looks and tactile feels that the Paint Synthesizer can generate.

5. When you feel you are ready to explore other areas of the program, use the **Operation** menu to move to a new Operation control pane and explore what it has to offer.

Hint:

The "**spacebar**" is used throughout the program as a hot key to quickly perform certain actions. You can always use **"Cmnd-spacebar"** to execute the current Operation's Action. You can use the **"spacebar** "to stop any currently executing Action. Studio Artist also uses the "**spacebar**" hot key to execute any interactive edits that use pressure. This allows you to execute a pressure sensitive edit without losing your pressure setting during mouse up.

Technical Support and Registration

Your Serial Number:

Note:

Before contacting Technical Support, please first look for the answer in this manual and also be sure to read the Read Me document on your Studio Artist CD-Rom. The Read Me contains updated information that may be newer than information in this manual. There may also be other documentation accompanying this manual—you should look there for answers as well. If you can't find the answer and do contact Technical Support, please have the manual and serial number in front of you and the application open with the area you want to know about easily acces-

sible.

Registration

It's important that you send in the registration card included with the Studio Artist CD-Rom, or register online. You need to register in order to qualify for technical support and future program and documentation updates. Mail in the registration card that came with the CD-Rom. You can also register online at the following URL:

http://www.synthetik.com/

Technical Support

Registered Studio Artist owners are entitled to receive reasonable technical support.

There are several ways to get the answers you need online by using the internet:

Answers to the most frequently asked questions are available on our online Tech Doc pages. Click on the link for detailed instructions, tips and troubleshooting help.

http://www.synthetik.com/

You can email a technical question to: techsupport@synthetik.com

FAX your technical questions to (415) 864-0433.

You can speak directly to a Synthetik Technical Support Specialist between 10 AM and 5 PM, PST, Monday through Friday at (415) 864-6587. You must supply your Studio Artist Serial Number to receive Technical Support.

Chapter 2: Operations

Studio Artist is based around the metaphor of a graphics synthesizer. Musicians have used audio synthesizers for many years to generate complex sounds and arrangements. Studio Artist extends these musical metaphors to the world of graphics. An individual can use Studio Artist's graphics synthesizer to generate an unlimited number of graphics patches that can be stored and recalled on the fly. These patches can be anything from a paint brush or paint type to complex graphical processes that can emulate traditional graphics arts techniques or produce some totally unknown new visual look.

At it's highest level. the program has a number of categories of modal interaction with the working Canvas that are referred to as **Operations**. Interaction may be through an automatic "**Action**", or one or more interactive "**Mouse Modes**". The user can choose the desired type of interaction (Operation and associated Mouse Modes) with popups located directly below the source image in the top left corner of the interface.

Users can navigate through a hierarchy of control panes to edit parameters associated with the current interaction mode. Individual parameter panes are accessed by using text popups associated with each pane. A complete collection of parameters is called a patch.

All of the nested control panes can also be accessed directly via the **Operation** menu located in the main menu bar.

Control panels are associated with the following types of modal Operations:

Paint Synthesizer
Presets
Image Processing
Bezier Draw
Bezier Edit

Region Selection
Interactive Warp
Timeline Animation

Each of these modal Operations will be explained in more detail in the following sections of this chapter.

Paint Synthesizer

Synthetik Artist is based around the metaphor of a graphics synthesizer. A user can construct graphical patches that allow for an unlimited number of potential visual looks.

There are a large number of editable parameters that control the behavior of the Paint Synthesizer. These parameters determine the look and feel of the current paint. You can paint manually or have Artist generate painting automatically as a Paint Action, or work with a hybrid process where Artist's automatic painting is being guided by your manual painting interactions.

Paint Action Sequences can be used to combine together different Paint Actions to generate complex art processes. You can use Paint Action Presets to access these operations at the touch of a button.

Paint Synthesizer Patches are complete sets of all of the editable parameters associated with the Paint Synthesizer. There are over 200 of these editable parameters. Paint parameter memories are located above the Paint Synthesizer control panes next to the Source image. These memories allow you to save and restore complete sets of all of the editable parameters on the fly.

Paint Synthesizer Patches can also be imported or exported to disk as individual files. They can also be accessed as Paint Presets. Any Paint Patch files that are placed in the **Preset** folder next to the application will appear as Paint Presets. Subfolders within the **Preset** folder will appear as Paint Preset categories. Use these sub folders to custom

organize your Paint Presets.

See Chapter 3: Paint Synthesizer for detailed information on how to use the Paint Synthesizer.

Presets

Presets are predefined patches stored on your hard disk. You can organize your presets according to **Category** and **Patch** names within a Category. The **Category** is the name of the sub-folder the presets are located within. The **Patch** name is the name of the preset file located on disk.

There are three kinds of presets:

Paint Presets are a complete set of parameters for the auto paint synthesizer. They are stored in the "**Preset**" folder located next to the Synthetic Artist application.

Paint Action Presets are a set of actions that can be applied to the current Canvas. They are like macros and can include paint actions as well as image operation actions, warp actions, etc. They are stored in the "**PASeq**" folder located next to the Synthetic Artist application.

Workspace Presets allow all of the different paint, Bezier, color, and preset memories in the application to be saved and restored. They are stored in the "**Workspace**" folder located next to the Synthetik Artist application.

You can access Presets by choosing from the **Category** and **Patch** popups, or by clicking on the appropriate patch icon. The set of icons in the scrollable table corresponds to the patches located in the currently selected Category folder. The 10 preset icons located at the bottom of the Preset pane are Preset memories. They are gray if currently empty. Click on them to make the stored preset the currently active one. Option click them to record the current preset in the

memory.

You can use the Preset memories to quickly switch back and forth between paint patches or paint action sequences while you are working.

You can load a new set of Paint and PASeq preset memories by calling up a specific Workspace preset.

You can import a Preset file located anywhere on your hard disk by using an import menu command.

You can export or write a preset to a file on your hard disk by using an Export menu command.

You can edit or overwrite an existing current preset by option clicking the large current Preset Icon. The icon PICT itself will not be overwritten. The actual icon image is stored as PICT resource #1000 in the Preset's resource fork. You can edit it with ResEdit if you wish. Or, you can use the "**Update Current Preset Pict**" menu command to overwrite the PICT with the current Canvas image.

Hint:

Each preset has an associated balloon help message. To read the message, click on the **?** icon next to the current preset's image icon. A balloon help message for the preset will appear.

The factory presets have helpful hints in this message. However, you can customize any preset's help message. Similarly, when you construct a new preset, you should add a help message to it. To edit the current preset's help message, use the '**Update Current Preset Help Tex**t" menu command.

Image Operations

Image Operations are a set of image processing filters or processes that

each have unique parameter panes. They act to transform the current Canvas. Some Image Operations may also be modifiable by current visual attributes, global paint color memories, or the current region. The current Image Operation is initiated by pressing the **Action** button (or **Cmnd Spacebar**).

Each Image Operation also has a compositing operation and mix control located at the bottom of the parameter pane. The use of different compositing operators can totally change the effect of a given image operation, resulting in a manyfold increase in possible visual effects achieved with a given image operation. You can also specify a specific number of repetitions of a particular image operation.

Paint Action Sequences can be used to combine together different Image Operations to generate complex visual processes. You can use Paint Action Presets to access these operations at the touch of a button.

See Chapter 4: Image Operations for detailed information on how to use the Paint Synthesizer.

Bezier Draw

You can use the mouse or pen to draw a Bezier path on the Canvas. If you are using a pressure sensitive pen, the pressure information will be stored along with the path. If you are using a mouse, the default pressure settings will be stored with the path.

Each Canvas layer has an associated Bezier Frame that contains all of the Bezier Paths currently associated with that Canvas layer. Switching to a new Canvas layer will also switch to it's associated Bezier Frame.

Mouse Mode

Freestyle

Allows for drawing a freeform curve that is then converted into a Bezier representation at mouseup.

Bezier Curve

Allows a curve to be built up by positioning Bezier control points. You can interactively adjust the Bezier curve until drawing is terminated by mouse up or the '**spacebar**' key.

Pen tilt controls the direction and extent of the curve. If you don't have a tilt sensitive pen, press '**option**' to adjust the direction of the curve. To add a new segment to the curve, press the '**Cmnd**' key. The '**t**' hot key lets you translate the existing curve path. The '**r**' hot key lets you rotate the existing curve path.

Editable Bezier Draw Parameters

Curve Options

Various options for how subsequent Bezier control points interact.

Smoothness

Allows you to determine the complexity of the Bezier curve that results from your freestyle drawing. Increasing the smoothness will result in a smoother curve with fewer Bezier control points. Decreasing smoothness will result in a curve that more accurately tracks what you draw at the cost of more Bezier control points and a rougher appearance.

Offset Max

Specifies the maximum amount of interactive offset for one section of the Bezier curve when drawing in the Bezier Curve mouse mode.

If you wish to edit a Bezier path after you draw it, you need to switch to the Bezier Edit pane.

If you turn on Bezier recording, then the paths associated with normal paint operations will be converted on the fly to Bezier paths and stored

in the current Bezier frame. You can turn on and off Bezier recording by using the BezLayerRecord menu to toggle the record state.

You can save the current Bezier frame in a Bezier memory by option clicking on one of the four Bezier memory buttons, located above the paint Canvas. Clicking on a Bezier memory will erase the existing Bezier frame and set it to the contents of the specific Bezier memory.

The master erase button erases the Canvas image layer and it's Bezier path frame. The Set to Background button just erases the Canvas image layer and does not erase it's associated Bezier path frame.

Bezier Edit

You can use the mouse or pen to edit any Bezier paths in the current layer's Bezier frame. Menu commands are also available for Bezier Path Copy/Paste style editing as well as path transformation operations.

Adjustable Bezier Edit Parameters

Edit Pt Options

Various options for how adjacent Bezier control points interact when editing the curve.

Expand Options

Various options for how the Expand Path Layer menu command works.

Curve Editing Hints:

Right now you can select any combination of individual curves. However, you can't currently select individual control points.

You can select a curve by mousing down on it. Or, you can mouse down in an empty area and drag out a selection rectangle. Any curves in the selection rectangle will be selected.

If you hold down the '**shift**' key while selected, your new selection will be added to any existing selected curves. If you '**shift**' select a pre-selected curve, it will be deselected. If you don't use the **'shift'** hot key while selecting, any pre-selected curves will be deselected.

You can move selected curves by dragging them with the mouse in the Canvas.

Hot Keys:

'**r**' - rotate selection
'**s**' - scale selection

Need to mouse down on specific curve for '1' and '2'
'**1**' - interactive displacement of curve
- pressure controls width
- horz movement controls amount

'**2**' - interactive smoothing
- horz movement controls smoothing

'**3**' - interactive sphere displacement of selected curve(s) control points

'**4**' - interactive sphere displacement of 1 selected curve

'**5**' - redraw pressure for selected curves.

'**spacebar**' -used to execute an interactive edit (hot keys '1,2,3,4')

arrow keys (up,down,left,right)
- nudge selected curves accordingly

'**shift**' - normal shift select behavior

Note that '**space bar**' is used to execute hot keys '1,2,3,4'. In general, the '**space bar**' hot key is used throughout the program to execute an interactive edit. We use a hot key to execute, as typically interactive edits use pressure. This means we can't use mouse up to execute, as you'd loose your pressure setting.

To delete a control point:
option click the control point

To delete a curve:
option click the curve
or, '**delete**' key deletes all selected curves

To cut a curve into 2 curves:
'**c**' hot key and touch curve at cut point

To join 2 curves into 1:
Select the 2 curves. Go to the Edit menu and pick the "**Edit : Connect Two Curves**" menu command. The menu is only active if 2 curves are selected. The closest end points are connected, so move the 2 curves accordingly before using the menu command to connect.

You can use the Edit menus '**Cut**, **Copy**, **Paste**, and **Clear**' to edit selected curves.

You can use the Edit menus '**Flip** and **Rotate**' to transform selected curves.

If you copy a selected curve, and then immediately paste it, the pasted curve will sit directly on top of the source curve. Due to the xor curve drawing, you won't see the pasted curve. You can use the arrow keys to nudge the pasted curve off of the source curve, which will then make them both visible.

Region Selection

This interactive Operation mode is used to generate region or area selections. The current selected regions can then be used to mask the various Studio Artist Operations like painting or image processing. Or, it can be filled with color or used to move an area of the Canvas as an Action while in this pane.

Mouse or pen down on the Canvas to dynamically select an area based on the current Interactive Generation settings. The current selection is displayed as a color inversion on the current Canvas. Use the **spacebar** to grab the current selection as the current region.

After interactive generation, all unselected areas of the Canvas will be grayed out while in this Operation mode (unless the **Region Display** checkbox is deactivated). When in other Operation modes, unselected areas will only be grayed out if Region Masking is turned on. You can turn on and off Region Masking with the **Mask** popup located in the Control Strip above the Canvas.

Interactive Generation

Source

Rectangle

Interactively select a rectangular region.

Source Image / Canvas Image / Texture Image / Orient Image

Interactively grows a region from the start point, based on the chosen source attribute and the **Set Mode**.

Local vs. Global

Local grows a region from the current start point. Global grows a region everywhere in the source that matches the current range.

Circle Paint

Interactively paint your selection with a pressure sensitive circle brush.

Lasso Area

Interactively draw your selection with a marching ants path.

Bezier Curve Area

Interactively draw your selection with a marching ants Bezier curve path.

Set Mode

Determines whether pressure or mouse location is used to grow the region.

Display

Determines how the interactive selection region is displayed on the Canvas as it is interactively generated.

Region Display Active

Determines whether the current region selection is displayed while in this pane. Anything not selected will be grayed out on the Canvas if turned on.

Fill Action

Fill Operation

Determines what is filled in the current region if the **Action** button is pressed (or **cmnd spacebar**).

Move Mode

Specifies the compositing operation used when moving the region selected Canvas to a new location with the '**m**' hot key. Holding down

the '**m**' key allows you to move a copy of the selected Canvas region to a new location instead of performing a new selection.

Hot Keys

'**spacebar**' - used to grab current selection as the current region.

'**x spacebar**' - overwrite the Canvas with the appearance of the current active region selection. Useful as a special effect.

''**t**' - translate current start location. (Currently works for **Rectangle** and **Circle Paint** only).

'**z**' - holds the current interactive selection

'shift' - adds to current selection region rather then replaces

'**option shift**' - subtracts from current selection rather then replaces.

'**m**' - moves a copy of the selected Canvas region instead of performing a new selection.

Hint:

The use of the '**q**' hot key with a mouse down in the Canvas can be used at any time when in a different section of the program to momentarily drop back into Region Selection to generate a region on the fly. The current **Source** setting will determine the type of Region Selection performed during this momentary operation.

Interactive Warp

Interactive warps are complex spatial transformations or distortions that operate on the current Canvas layer and can be interactively controlled by the current pen position and pressure. They are fully

recordable as a step in a Paint Action Sequence. They can be used for subtle spatial distortion, complex mosaic or symmetry operations, and for outrageous or grotesque special effects.
Simply choose a specific warp type and use the pen or mouse to dynamically control the warp.

Type

Specifies the type of interactive warp.

Hot Keys

'**t**' - used to translate or move the start position of a local warp.

'**spacebar**' - used to execute the current warp.

Timeline Animation

Used to generate keyframe animation actions. The keyframes are determined by keyframe positions for sets of Bezier curves. You specify the Bezier curves by storing them in position memories located in the Timeline Animation window, which is opened by executing the "**Movie : Keyframe Timeline Window...**" menu.

The timeline animation window is currently very basic, and will be extended in future versions. It's based on the concept of a time grid of keyframe memories. Each layer has its own row of horizontal cells in the timeline animation window. Each vertical column of cells in the timeline animation window corresponds to a specific frame time. Clicking on a cell moves the Canvas to the frame time associated with that particular cell. Option-clicking on a cell records the current Bezier path frame into that particular keyframe position.

You draw a set of bezier curves using the **Bezier Draw** Operation mode. Or, you can record your Bezier paths by drawing in the Paint Synthesizer with Bezier Mouse Recording turned on.

You can then edit the path shapes and positions using the **Bezier Edit** Operation mode. You can record the current positions of a set of Bezier curves in a timeline memory by option clicking on the desired memory cell. You should only edit the positions of the Bezier curves (ie. translate, rotate, scale). Don't change the number of Bezier control points, or the number of curves across keyframes for a layer.

The **Action** button will start generation of the animation frames. They will not be written out to a movie file unless you have specified a current output movie. Use the "**Start Movie to File...**" menu located in the Movie main menu to initially setup an output movie file.

Editable Animation Parameters

# of Frames

How many frames in the animation

Frames per Second

How many frames per second of animation

Mode

What kind of animation.

Time Animation - Paints the bezier curves.
Warp - Warps the specified Source image. The warp is specified by the movement of the bezier curves.

Morph - Currently morphs layers 2 and 3 into layer 1. Your Bezier keyframes should be located on layers 2 and 3.

Geodesic Warp - Uses a different algorithm to compute the warp.

Feedback Warp - Simulates video feedback.

The # **of Frames** and the **Frames per Second** parameters will also be used for any Paint Action Sequence Animations as well as for any Movie Files written to disk.

See the '**Keyframe Timeline**" and "**Working With Movies**" sections of this chapter for more information on how to generate animation movies.

Note:

This set of actions is still under development and will be more fully developed in future versions of Studio Artist. However, the existing limited functionality is still very useful and fun, so we are including it within the 1.0 program release.

Canvas Layers

The Canvas can have an unlimited number of Layers. Each Layer is composed of an individual image buffer as well as an associated Bezier path frame.

Layers can be viewed individually, or in combination. When viewed in combination, they can interact with each other through different compositing operations.

You can switch between Canvas Layers using the Current Layer popup located in the control strip directly above the Canvas. Or, you can access and edit individual Layers in the Layer Window, which can be opened by executing the '**Canvas : Layer Window...**" menu.

The Layer Window contains a list of all of the individual layers associated with the Canvas. Each individual Layer in the list has controls to mute playback of the Layer, edit the Layer name, specify an associated compositing operation, and specify a mix.

Like all lists in Studio Artist, individual Layers are applied to the Canvas in order from top to bottom.

Actions

Studio Artist has two different ways to record and playback a series of Operation Actions. These are Paint Action Sequences and History Sequences. At the base level, they are both composed of the same kinds of data and are stored in the same file format, but are used in different ways within the program.

Paint Action Sequences

A Paint Action Sequence is a series of Actions that can be recorded and played back in series of step by step to an existing or new source image and Canvas. Paint Action Sequences can be used in several different ways. They can be used to build custom art processes that are then accessible at the click of a button. Or, they can be used to record everything you do in the program. This History Sequence can be played back at a later date, used as a form of unlimited undo, or rerendered to be played back at a higher resolution on a larger Canvas.

Paint Action Sequences can be imported or exported to disk as individual files. They can also be accessed as Paint Action Presets. Any Paint Action Sequence files that are placed in the **PASeq** folder next to the application will appear as Paint Action Presets. Subfolders within the **PASeq** folder will appear as Paint Action Preset categories. Use these sub folders to custom organize your Paint Action Presets.

All interactive operations as well as operation actions can be recorded as a Paint Action Sequence or as a History Sequence. As far as Studio Artist is concerned, there is no difference between the two. The file formats are the same, and they can be exchanged at will. For example, a History Sequence of a painting session could be played back later as

a Paint Action Sequence with a different source image into a different size Canvas.

The reason there are two different Sequences is that they are typically are used in different ways. Paint Action Sequences are used to implement custom art processes on the fly while you work. The History Sequence is used to keep a record of everything you've done in a painting session. This sequence can later be played back and edited, and can be thought of as a form of unlimited undo.

KeyFrame Timeline

The Keyframe Timeline can be used to specify Bezier path movement over time. The resulting path movement can be used to build up paint animation, or to define image warping or morphing operations.

The Keyframe Timeline allows recording and playback of unlimited Bezier path keyframes over the course of an animation or movie. The Timeline looks and acts like a large matrix of Bezier path memories. Each horizontal row of cells corresponds to a Canvas layer. Each vertical column of cells corresponds to a particular frame time.

Individual Bezier path keyframes are drawn and edited using the Bezier Draw and Bezier Edit operation panes. You can draw or edit Bezier paths with the mouse, or generate them automatically from the Source image, Canvas image, or individual movie frames.

Option-clicking a keyframe cell records the current Bezier path frame into that keyframe location. Clicking the keyframe cell moves to that cell's frame time and loads the current Bezier frame with the keyframe interpolated Bezier paths associated with the cell's frame time.

Working With Movies

You can use Synthetik Artist to generate movies or process existing movies. You can use Artist to generate paint animation, auto-rotoscoping, image warping, morphing, or process each frame with a Paint Action sequence. If processing an existing movie, the output resolution can be different than the input resolution.

Generating a Movie File

To generate a movie file, you first need to setup the output file. Use the "**Start Movie to File...**" menu located in the "**Movie**" main menu to specify the output file. The dimensions of the output movie will be the dimensions of the current Canvas. The frame rate will be the setting of the "F**rames per Second**" parameter, located on the **Timeline Animation** Operation parameter pane.

Once you have started your movie file, you can write out movie frames in a number of different ways. You can initiate a **Timeline Animation**, **Timeline Warp**, **Timeline Morph**, or a **Paint Action Sequence** (**PASeq**) movie by using the menu commands located in the movie section of the "**Movie**" main menu. The **# of Frames** and **Frames per Second** of the output movie are set in the **Timeline Animation** parameter pane. You can also initiate Timeline Animations from this pane by using the **Action** button.

You can save the current Canvas at anytime as a movie frame by using the "**Save Canvas as Movie Frame**" menu. If you turn on the "**Write Frame Each Action**" menu flag, the next time you initiate an **Action** within Artist, the Canvas image that is the result of that action will be written out to the movie file as a new movie frame.

Remember to close you current movie file when you are done writing frames with the "**Stop Movie to File**" menu command.

Processing an Existing Movie File

Currently, you can process an existing movie file with a Paint Action Sequence. To start the process, use the "**Process Movie with PASeq...**" menu command located in the "**Movie**" main menu. You will first be prompted to select a source movie file. You will then get a dialog that allows you to specify the Canvas and hence processed output movie frame dimensions. The output frame dimensions can be different than the input frame dimensions. After hitting **OK** for this dialog box, you will be given a dialog to name your output movie file.

If you hit **Cancel**, the input source movie will still be processed, but the output frames will not be written to an output file. This is a good way to try out a process before committing it to an output file. Mouse down or hit spacebar to stop the movie processing at anytime.

Each input frame will be used as a source image for the current Paint Action Sequence. You can examine or edit the current Paint Action Sequence by using the Paint Action Palette Window. Remember, you need to load the source frame into the paint Canvas as a part of your Paint Action Sequence if you want to perform image processing operations on the movie source frames. You can do this by setting the Canvas Background popup to **Image** while recording your Paint Action Sequence.

Playing a Movie File from RAM

You can load an existing movie file into RAM by using the "**Load RAM Movie...**" menu command. Depending on the size of the movie file, it may take some time to load. Once the movie is loaded into RAM, you can playback and edit uncompressed frames using the movie transport controls located above the paint Canvas.

Editing a Movie

To edit a movie frame, use the transport controls to go to the frame of interest. Paint or process the frame as desired. Then, press the record button located in the transport area to record the existing Canvas into the current movie frame location.

Remember to save the edited movie file by using the "**Save RAM Movie**" menu.

You can unload a RAM movie without saving by using the "**Unload RAM Movie**" menu command.. Loading a new RAM movie unloads an existing loaded movie.

Chapter 3: Paint Synthesizer

Studio Artist is based around the metaphor of a graphics synthesizer. A user can construct graphical patches that allow for an unlimited number of potential visual looks. This overview will help you understand the structure of the Paint Synthesizer so that you can quickly start modifying preset patches as well as create your own.

Introduction

The Paint Synthesizer allows you to control and use Studio Artist's paint capabilities. There are a large number of editable parameters that make up a paint patch. These parameters determine the look and feel of the current paint. You can paint manually or have Artist generate painting automatically as a Paint Action, or work with a hybrid process where Artist's automatic painting is being guided by your manual painting interactions.

A paint stroke is composed of a path, paint, and a paint brush. The paint brush applies the paint to the path. If you are painting manually, your movements of the pen or mouse define the path. If Artist is painting automatically, then the path is generated by Artist. What the generated path looks like will depend on the paint patch's editable path parameters as well as the source image and it's visual attributes.

Use of a graphics tablet and associated pressure and/or tilt sensitive pen or airbrush tool can greatly expand the range of artist expression and dynamic control available from a given Paint Patch. We recommend the Wacom Intuos tablets to fully utilize the expressive potential available within Studio Artist. Expressive features like pressure, tilt, tilt orientation, tangential pressure, and pen velocity can be used to modulate individual parameters within the Paint Synthesizer. In the extreme case, you have the ability to modulate over 200 parameters in real time as you use an expressive drawing tool like a pressure sensitive pen.

Overview of the Paint Synthesizer

Concept

The Paint Synthesizer is designed based on metaphors originally used in the world of audio and music synthesis. The synthesizer is composed of a number of modules that can either generate or process graphical and visual signals. Each module has a number of editable parameters that controls it's behavior.

Many parameters can also be modulated by other modules, by the signal outputs of other modules, or by external signals. It's useful to keep the concepts of signal flow and routing in mind when trying to understand how the synthesizer works. A signal could be anything from a paint color to a path for drawing to an image. Properties of one signal could be effecting the generation or processing of another. The synthesizer is a flexible and configurable environment for constructing visually rich and highly dynamic paint and drawing tools.

Studio Artist also has built in visual intelligence modules that are based on research in the cognitive neuroscience of visual perception. These modules can be used to generate paint brushes that offer intelligent-assistance. They can either aid you in creating a drawing, or generate painting paths automatically.

Studio Artist uses a Source Image in much the same way that an artist would use a model, as a source for visual abstraction. When you open a new Source Image, Studio Artist spends a short time examining it and then generates a number of internal visual attributes that it uses as the basis for it's intelligent assisted drawing.

You can use as little or as much intelligent-assisted drawing as you choose. You can turn off all assistance and totally paint in the tradition manual fashion. Or, you can press Action and have Studio Artist do all the work. The choice is up to you.

Most likely, you will work somewhere in between these two extremes. If you don't know how to draw, you will find that Studio Artist is the first Computer Painting program that will allow you to create satisfy-

ing art without having significant drawing skills.

If you have spent years honing and refining your drawing and painting skills, you can use intelligent-assistance to aid you in performing repetitive or tedious pen work that might be too time consuming to consider doing manually. This might include painting with dynamic crosshatching patterns or auto-rotoscoping individual frames of film or video for animation.

Drawing Engine

The Paint Synthesizer is based on a model of applying dabs of paint to the Canvas along a path. How the dabs are applied to the path and the shape of the path itself can be extensively modulated under interactive control.

A path can either be defined manually using a pen or mouse, automatically by a path generation algorithm, or by a hybrid process that combines manual drawing with on the fly auto path generation. Collections of recorded Bezier paths can also be accessed and modulated or transformed in real time as a further source of automatic path generation.

A dab of paint is generated from a dynamic computational brush and dynamic computational paint. Both dynamic elements (brush and paint) can be changing under your interactive control, or the Paint Synthesizer may be modulating them on it's own.

The dynamic brush is generated from a **Brush Source** and a **Brush Type** computational generation algorithm. Brush modulation parameters specify additional parameters to modulate the dynamic brush size, orientation, and texture. Each time the brush is used to apply a dab of paint, it could be the same or totally unique. It all depends on how the Paint Synthesizer editable parameters are configured.

A dab of paint is generated at a particular path location using the current dynamic brush and two **Paint Fil**l sources. They are called **Fill From** and **Fill To**. The dynamic brush, the two paint sources, and several **Fill Option** parameters act together to generate a unique dab of paint to be applied at a particular path position.

The dab of paint is then applied to the Canvas with a particular painting Algorithm. Different **Compositing** and **Masking** options can be chosen for the particular painting algorithm. The application of the dab to the Canvas can be modulated interactively or algorithmicly.

Certain painting Algorithms that **Mix** may spawn a second interacting **Paint Fill** process with it's own **Compositing** and **Blending** parameters. The combination of this complex generation process allows for total flexibility in creating unique and different paint visual looks and tactile feels. A Paint Patch can be built to emulate traditional media or to create something totally wild and new.

After a Paint Patch is created and edited, it can be accessed as a Preset for ease of use in creative drawing and painting. The Paint Synthesizer gives you extreme control over creating your own painting tools. The Presets allows you to access pre-built painting tools without getting under the hood into their internal complexity unless you so choose.

There are no artificial limitations in this Paint Synthesis approach. Unlike other painting programs, we don't make your decisions for you. Other programs provide a few nonuser configurable paints with very limited editability and interactivity. This generic approach to providing painting tools really limits your freedom of creative expression.

Paint Synthesizer Editable Control Panes

The Paint Synthesizer is composed of several editable parameter panes. They are loosely organized in terms of signal flow. Each pane contains a collection of editable parameters that control a particular aspect of the Paint Synthesizer's drawing engine. These parameters define the look and feel of the resulting Paint Patch and it's associated interactive mouse or pen modes and Paint Actions.

Path Start
Path Shape
Path End
Path Application

These parameters control the appearance of the path. You can control how start positions are chosen for the path, how the path is generated (which determines it's subsequent appearance or shape), and how paths are terminated or ended based on visual attributes.

How the path parameters are used depends on whether you initiate a paint action, or use the mouse or pen to draw a path. Even though you may use the pen to specify a primary path, the path parameters can still affect how the pen path is drawn onto the canvas. This interaction can be subtle or quite dramatic, depending on the path settings and the mouse mode.

Paint Color Source
Fixed Colors
Paint Source Offset
Paint Fill

These parameters control the color and appearance of the paint, and how it is applied to or interacts with the canvas and the brush.

Brush Source
Brush Type
Brush Modulation

These parameters control the characteristics of the paint brush used to apply paint to the canvas. You can control the brush mask source, appearance, type, texture, and size and orientation modulation.

Background Texture

This pane lets you define a dynamic background texture.

Miscellaneous

This pane has some additional parameters. You can access the region draw and default pressure settings here.

Global Evolution

This pane allows you to morph two complete paint patches, or to randomly generate or evolve new patches.

Paint Synthesizer Interactive Mouse Modes

There are several different interactive mouse or pen modes associated

with the Paint Synthesizer. Each mode allows you to use the mouse or pen in a completely different way. A default Mouse Mode setting is stored with each Paint Patch, but you can change this setting and subsequently change the interactive behavior of the mouse or pen tool. Switching between these different modes can have a profound effect on the visual appearance of the resulting interactive paint.

Interactive Pen

Paints on the fly based on the user's pen or mouse movements. Paint flows in real time from the pen to the Canvas.

Freestyle

Draws the pen path as a marching ants thin line until mouse up, when the path is then painted.

Certain paint parameters can be modulated by the path length. With this mouse mode, the path length modulation will be based on the complete drawn path length. Because Interactive Pen draws on the fly, the Paint Synthesizer has no way of knowing the final path length while it is painting. Default settings located in the Paint Shape parameter pane are used in Interactive Pen mode to determine path length modulation.

Freestyle Autodraw

Draws the pen path as a marching ants thin line until mouse up. Then, the drawn path is used as a scanline to start a series of auto-drawn paths that are painted. The auto-drawn paths are generated according to the path parameter settings located in the Path Start, Path Shape, Path End, and Path Application parameter panes.

AutoDraw One Shot

Autodraws and paints a path from the mouse down start point. Only one path is drawn.

AutoDraw Interactive

Autodraws and paints a series of paint strokes from the current mouse position. The spacing of new autodrawn paths is determined by the scan spacing parameter located in the Path Start parameter pane.

How the autodrawn paths are generated and what they look like is a function of all of the paint parameters associated with the path (Path Start, Path Shape, Path End, and Path Application panes). Think of the autodrawn paths as a stream of intelligent paint particles with minds of their own that are being generated by your pen motion. You can use this stream of particles for something as subtle as generating an airbrush to generating unique-looking dynamic particle brushes to full intelligent-assisted drawing that might dynamically crosshatch or autosketch an image for you as you wave the mouse on the canvas.

RegionDraw

The user interactively specifies a local region with the pen. The size, orientation, and shape of the local region can be adjusted by moving the mouse and adjusting pen pressure. Mouseup or hitting the spacebar then paints the specified region with a series of paths generated algorithmicly.

Using the '**Option**' hot key at mouse down allows alternative selection of the region to be drawn based on the current Region Selection source mode.

Bezier Curve

Draws the pen path as a marching ants Bezier curve until mouse up, when the path is then painted. Pen tilt controls the direction and extent of the curve. If you don't have a tilt sensitive pen, press '**option**' to adjust the direction of the curve. To add a new segment to the curve, press the '**Cmnd**' key. The '**t**' hot key lets you translate the existing curve path. The '**r**' hot key lets you rotate the existing curve path.

Hot Keys for Interactive Mouse Modes

There are a number of hot keys that can be used to switch the behavior of the mouse or pen on the fly when working with the Canvas. The following hot keys work with all of the Interactive Mouse Modes.

Color selection from the Canvas:

You can select a current source color directly from the Canvas by using the '**c**' hot key when mousing down in the Canvas. This key will disable drawing. Dragging the mouse or pen will update the color in the source color current color area if source color (as opposed to source image) is selected in the source area.

Hot key:
'**c**' - select current source color from Canvas.

Quick navigation hints:

You can use the zoom in/out buttons located above the vertical slider for the Canvas image to zoom in and out of the Canvas. You can also use the following hot keys associated with mouse or pen clicks in the Canvas.

Hot keys:
'**=**' - zoom in centered at mouse click.
'**-**' - zoom out centered at mouse click.

Quick Region Selection:

You can define a new region selection directly from the Canvas by using the 'q' hot key when mousing down in the Canvas. This key will disable drawing. Dragging the mouse or pen will interactively generate a new selection region using the current Region Selection Operation settings.

Hot key:
'**q**' - select a region without leaving the Paint Synthesizer.

Freestyle
Freestyle Autodraw

Hot keys:
'**t**' - translate existing path.

Region Draw

Hot keys:
'**t**' - translate existing region path.

's**pacebar**' - terminate and draw current path.
'**1,2,3,4,5,6,7,8,9,0**' - hot switch to first 10 region draw fill types.
'**option**' - use current Region Selection generation method to define area to draw.

Path Start

The Path Start parameters define how Studio Artist automatically picks a starting location on the Canvas to begin a paint path. Studio Artist generates start points for paths by algorithmicly scanning the canvas. The scan process is composed of two parts. An algorithmic generator generates an initial scan location. A second scan algorithm then works off of this initial scan location to generate a limited series of start points. When this second scan is finished, the initial generator moves to a new scan location.

Whether a scan location is actually used as a real path start point can be influenced by a number of settings. Most of these setting are tied to the Source Image visual attributes. Some of the settings are tied to other attributes based on the current Canvas, Blanking buffer, or Region Selection. Start points may be chosen from a set range of a visual attribute, or with a probability based on the visual attribute.

Max Strokes

Determines how many paths will be generated before a paint action stops on it's own. You can manually stop a paint action at any time by hitting the spacebar (or any other key) or by mousing down anywhere in the interface (typically on the gray background).

Generator

The generator scans the canvas according to the algorithm chosen in the popup. Different generator algorithms will scan or move around the canvas in different ways, generating correspondingly different visual appearances. Some of the settings generate random movement while others scan the complete canvas of it's borders with a regular grid.

The reset button resets the current generator algorithm.

Scan

Determines whether a secondary scan path is followed from the initial starting scan location derived by the generator algorithm.

Probability

Sets a probability constraint on whether the current scan point is actually used as a path start location. If the probability constraint cause a scan point to be ignored, the generator will continue to generate new start scan locations until one meets the probability constraint.

Inhibitor

Determines a condition that absolutely inhibits a current scan location from being used as a path start. If the current scan point is inhibited, the generator will continue to generate new start scan locations until one is not inhibited.

Blanking

Determines how a paint stroke will overwrite the blanking buffer.

The reset button resets the current blanking buffer.

Texture Range

A scan location is only used for a path start if the value of the texture visual attribute at the scan location falls within this range when the checkbox is checked.

Luminance Range

A scan location is only used for a path start if the value of the color luminance visual attribute at the scan location falls within this range when the checkbox is checked.

Scan spacing

Determines the spacing for the path scan specified by the scan popup. This parameter also specifies the scan spacing for freestyle autodraw and autodraw interactive painting mouse modes. For example, set it to 0 if you want autodraw interactive to act like an air brush (ie. continuously generating new paths without moving the mouse) , or 10

if you want a new path to be generated every time the mouse moves 10 pixels.

Path Shape

The parameters on this pane determine what an automatically generated path will look like. A path can be generated algorithmicly, or by interactive modulation of a set of Bezier paths stored in one of the Bezier path memories.

Symmetry

Determines whether a path is generated symmetrically or not from a start point. Symmetric means that the start point will be in the middle of the generated path. Non-Symmetric means that the start point will be at the beginning of the path.

Path Length

Determines a range of possible path lengths. If no modulation option is specified, the Max value is used. If the path end conditions terminate the path generation before the Min path length, the path is not used.

Path Mod

Determines how the path length is modulated (ie. the source of the modulation). The resulting modulated path length will modulate between the max and min lengths.

Certain paint parameters can be modulated by path length. However, if you are drawing using the interactive pen mode, drawing occurs on the fly and the paint synthesizer does not know what the final path length will be. It assumes the final drawn path length will be the Path Length setting, unless the Modulo checkbox is on.

Modulo

Path length modulation repeats along the complete path if modulo is

on.

% Length

Determines the modulation path length. It's a percent of the Path Length parameter. If modulo is on, then the modulo length is this setting.

Path Type

Determines the path generation algorithm.

Path Angle

Determines the source of the angle information used in the path generation algorithm.

Angle Mult

Typically set to 100. Used as a multiplier of the current path angle in the path generator. Determines the number of revolutions (divide by 100) in a spiral path.

Angle Offset

Offset added to the path angle.

Angle Slew

Determines how quickly a change in path angle is accumulated in the path generator. Smaller values lead to smoother paths.

Angle Inc

Determines how often the path angle is updated. For example, a setting of 10 means that the path angle will only be updated every 10 pixels.

Angle Mod

Specifies a modulation generator that modulates the current path angle.

Mod Inc

The incremental spacing associated with one cycle of the various Angle Modulation algorithms.

Mod Inc

The maximum amount of displacement in pixels applied to the current path angle. Any displacement modulation will be from zero to this maximum setting.

Path End

The parameters on this pane are used to specify possible conditions that will terminate or end the generation of a autodrawn path. Manually drawn paths can also be masked with these settings. Masking a manually drawn path will override the application of paint along the masked portion of the path.

Mask Interactive Pen

Inhibits path generation for the Interactive Pen mouse mode based on the other Path End settings. This allows the Path End settings to be used to intelligently mask Interactive Pen drawing.

Blanking

Stops path generation if the current path location is set in blanking buffer

Not White

Stops path generation if the current path canvas location is not white

Texture Range

Specifies a range of values that the current path location must be within if the checkbox is on.

Path Diverge

Specifies a set of conditions that will cause a path to randomly diverge from it's present orientation.

Local Color Range

Specifies an offset range of possible color values based on the color of the path start location that the current path location must be within if

the checkbox is on.

Image Range

Specifies a source image luminance range that the current path location must be within if the checkbox is on.

Angle Threshold

If the current path angle changes by more then the threshold and the checkbox is on, terminate the path.

Wrap Path at Edge

Path reappears at opposite side of Canvas when it crosses a Canvas boundary if checkbox is on. Allows for the generation of canvas images that will automatically tile.

Region Path Stop

Terminate current path if it leaves the current region.

Visual Error

Terminate current path if the chosen visual error model thinks continued drawing will increase the visual difference between the canvas and the source.

Note:

The Path parameters allow for the auto-generation of a large number of possible paint styles and effects. However, be aware that you can use the Path Start or Path End parameters to generate a logically inconsistent patch. For example, a patch that has the Path End parameter Not White turned on will not autodraw on a black canvas background. The path ends when the canvas is not white, and the entire canvas is not white.

Path Application

Determines how the path is used to apply paint to the canvas.

The initial path can be modulated by a random displacement algorithm. It could be repeated several times or interpolated to insure continuity. Brush dabs of paint are then applied along the path according to an adjustable spacing. Constraints can also be specified that may examine the Source or Canvas and possibly override the application of paint along the path.

Interpolate Path

Make sure paint application path is continuous if on by interpolating any gaps in the path.

Repeat Stroke

How many times the path should be repeated to generate a paint stroke.

Option

What is used to determine 100% spacing (current brush size or maximum brush size). How often the paint is applied to the canvas by the brush is determined by the Spacing % setting below.

Mode

Specific spacing computation algorithm.

Prob

Determines whether there is a probability constraint that needs to be checked before applying paint with the brush at a specific path location. If the specified probability constraint is not met, then the paint is not applied at that path location.

Spacing %

How often along the path paint is applied by the brush to the canvas. The pixel dimensions of 100% is determined by the setting in Option.

Displace

What kind of displacement algorithm if any is applied to the path.

Displace Amount

The maximum amount of displacement in pixels applied to the path.

Any displacement modulation will be from zero to this maximum setting.

Displace Orient Direction

The orientation direction of the path displacement.

Path Increment

The incremental spacing associated with one cycle of the various Displace algorithms.

Orient

Specifies fixed orientation displacement vs displacement that tracks the path and offsets from the current path orientation.

Mod Type

Specifies a modulation source for the Displacement amount. The displacement modulation will be from zero to the Displace amount maximum setting.

Paint Color Source

The output of the Paint Color Source module is a dynamic color value that can be used for painting. The input to the module depends on what is currently selected in the Source control panel. If the user has specified source color, then the current color selection value is the input to this module. If the user has specified source image, the color value of the source image at the path start point is used as the input to this module.

This pane's parameters determine how the paint color may be modified, both initially and over the paint path. The initial paint color can first be run through a color transformation. The subsequent paint color is then randomized. It is then passed to a recursive blending operation. The output of the blend operation is then passed through a path color randomizer. The output of the path color randomizer is then possibly gradient modulated.

The output of this pane is used as a possible source for the Paint From or Paint To parameters located in the Paint Fill pane. What is actually applied to the canvas by the brush is specified on that parameter pane.

Color Mode

Specifies a possible transformation of the initial source color value. Some of these settings (Prob settings) may transform the initial source color into one of a set of colors that together over an area of the canvas represent the actual initial source color value.

The initial paint color may be algorithmically randomized.

Start Option

Determines how the initial paint color is randomized and offset.

Randomize

Determines the amount of initial color randomization.

Offset

Determines the amount of initial color offset.

Recursive Source Blend %

The initial paint color may be recursively blended with another color source as the brush proceeds along the application path. This value determines the initial source blend percentage.

Start

The start color source to the recursive blend algorithm.

Blend To

The second blend color for the recursive blend algorithm.

Path Color Mod

Determines the randomization algorithm for the color as the path is transversed.

Modulate Option

Determines how the path color is randomized as the path is

transversed.

Modulate Type

Determines the type of color randomization modulation as the path is transversed.

Modulate Amt

Determines the amount of color modulation as the path is transversed.

Modulate Inc

Determines the increment or spacing of one cycle of randomization for the path color randomization algorithm.

Path Gradient

Determines the path color gradient modulator. This specifies a gradient color shift that takes place as a function of the particular modulator's value along the path.

Gradient End

The second color the path gradient algorithm modulates to.

Fixed Colors

The actual paint applied to the canvas can be constructed from various combinations of the output of the Paint Color Source module and two Fixed Colors. The two Fixed Colors can either be static source colors or dynamically track the current Paint Color Source module output as color offsets. The combination of these three dynamic color sources allows for the generation of rich, expressive, textured paint with many subtle visual looks.

Each Fixed Color is determined by the following parameters:

Color Source

Specifies whether the fixed color is a static color associated with the square color memory, tracks the Paint Color Source start value, or

tracks the current Paint Color as it modulates on the path.

Color Mode

Specifies a possible transformation of the initial fixed color value.

Random Start Opt

Determines how the initial paint color is randomized and offset.

Random Start Color

Determines the amount of color randomization.

Offset

Determines the amount of color offset.

Paint Source Offset

The parameters in this pane can be used to offset the physical location of the current paint source. The offset can be fixed or a function of a random generator. Only the Fill From paint source is offset, not the Fill To paint source.

Currently the source image, canvas image, and undo images are offset. The paint color location isn't currently offset (but will be in a future release of Studio Artist).

You can use the Paint Source Offset parameters as a means to clone specific sections of the Source image in variable locations on the Canvas. The "Brush Displace" Algorithm settings in the Paint Fill pane also use these settings to define the actual brush displacement.

Tracking

This determines how the paint source tracks a path. (This should probably move out of the paint parameters and into the source control panel settings in a future version of Studio Artist).

StartPoint - subsequent locations along the path track off of the path

start point. This is the normal mode for painting.

Fixed - subsequent locations are always a fixed coordinate location. Set this location by mousing down at the appropriate position in the Source Image. This setting can be used to build a brush that paints with a fixed chunk of the Source Image.

Fixed Start - subsequent locations are always a fixed coordinate location. This location is wherever the start position of the path is located on the canvas.

Offset Start - subsequent locations along the path track off of a fixed location rather then the path's start location. Set this location by mousing down at the appropriate position in the Source Image. This setting is useful for cloning specific pieces of the Source Image in variable Canvas locations.

Offset

Determines the algorithm for generating or randomizing the source offset along the path.

Offset Amount

The maximum amount of offset in pixels applied to the path. Any offset modulation will be from zero to this maximum setting.

Offset Orient Direction

The orientation direction of the path offset.

Path Increment

The incremental spacing associated with one cycle of the various Offset algorithms.

Orient

Specifies fixed orientation offset vs offset that tracks the path and offsets from the current path orientation.

Mod Type

Specifies a modulation source for the Offset amount. The offset modulation will be from zero to the Offset amount maximum setting.

Paint Fill

Determines the appearance of the actual paint dab that is applied along the path to the Canvas and how the brush interacts with the paint dab and with the Canvas.

There are two paint sources (**Fill From** and **Fill To**) as well as a **Fill From Modulator**. The **Fill From** source is applied to the dark (black) part of the brush. The **Fill To** source is applied to the light (almost white) part of the brush. Pure white (or value 255) in the brush is used as a mask. How the **Fill From** and **Fill To** sources are combined over the gray values of the brush depends on the particular **Fill Option**.

The **Fill From** source can be spatially offset from the **Fill To** source by adjusting the parameters in the **Paint Source Offset** pane.

A paint dab is generated from the current brush output, the two paint fill sources, and their associated parameters. After the paint dab is generated, it is then applied to the Canvas according to a particular paint fill Algorithm, a Compositing operation, and several masking and blend options.

Certain paint fill Algorithms can generate a second paint fill process with different parameters that interacts and runs in parallel with the primary paint fill process.

Fill From

Determines the fill from source, which is applied to the dark parts of the brush.

Fill From Modulate

Determines how the fill from source is modulated.

Fill To

Determines the fill to source, which is applied to the light parts of the brush.

Fill Option

Determines how the Fill From and Fill To sources are combined together over the grayscale range of the brush to generate a dab of paint.

Algorithm

Determines the particular type of painting fill process. Some algorithm settings that Mix will generate an integral second Paint Fill process with their own Composite and Blend controls. The Mix Ratio control specifies the interaction of these two parallel Paint Fill processes.

Composite

Specifies a compositing operation that determines how the paint dab interacts with the existing Canvas.

Masking

Determines masking options for the application of the paint dab to the Canvas. If the masking option is true at a particular Canvas location, the paint will be applied to the Canvas.

Blend Mod

Determines a modulation source to modulate the paint blend to the Canvas.

Blend %

Determines the maximum paint blend to the Canvas in percent.

Z Mask

Determines if a Z depth mask and buffer is used for paint application.

Brush Source

Determines the initial source for the brush. You can see the current

source brush in the small image on the top right side of the pane.

The actual brush used for painting is the output of the Brush Type algorithm, which uses the Brush Source as one of it's inputs. Typically the Brush source is used as a mask for an overall dynamic computational brush. This could be a luminance mask or a depth mask or both.

Brush Source

Computational brushes are generated algorithmicly. Image brushes are generated from a source image file. Text brushes are generated from a text font and string of text. Movie brushes are generated from a source movie file.

Computational Brushes

There are many interacting parameters available to adjust the appearance of the computational brush. The source brush image will interactively update as you adjust the parameters.

Comp Brush

Type of computational brush

Bias/Gain

Define a luminance transfer function for the computational brush.

Horizontal/Vertical

Determines the size of the source brush.

Orient

Determines the orientation of the source brush You need to set the directionality to something other than zero to see the effect of this parameter.

Directionality

Determines the directionality of the source brush. Increasing the directionality makes the brush more elliptical.

Height

Height of the source brush. Values greater than 100% will react differently depending on the comp brush type.

Corner Pull

Pulls the brush towards or away from the corners.

Pre-Sym/Post-Sym

Distorts the symmetry of the source brush. Complicated interaction with Orient/Directionality, and Corner Pull.

Random Type

Specifies an algorithm to randomize the computational brush. If Unique randomization is specified, a unique and different Source Brush will be generated each time the Brush Modulation module generates a new instance of the Source Brush.

Image Brushes

A source brush can be generated from a static image file located on your hard disk.

You can load a new brush image file by using the "New Image Brush..." menu located in the "File" main menu. The brush file name, size, and the brush itself are displayed.

To choose a new image file as the Source Brush, use the "File : New Image Brush..." menu command. Use common sense when specifying a particular image as a Source Brush. Choose an image with dimensions appropriate for use as a brush source image. Depending on the settings in the Brush Modulation pane, many copies of the Image Source Brush will be generated in memory.

When loading a new Paint Patch, if Studio Artist can't find the brush image file originally specified, it will do two things. First, it will see if there is a brush file of the same name in the Brush folder located adjacent to the Studio Artist application on your hard disk. If it can't find a file with the same name in that folder or any of it's subfolders, Studio Artist will then bring up a Standard File dialog so that you can

manually specify the location of the Source Brush image file.

In general, you should keep your various image brush files in the Brush folder located next to the application. You can use subfolders within the Brush folder to organize your image brushes by category. Taking the time to manage your image brushes in this fashion will make moving between different machines and hard disks much easier.

Text Brushes

This brush dynamically generates the Brush Source from the individual letters in a string of text.

To change the text string used for the text brush, use the "Canvas : Text Brush Source..." menu command. This command will bring up a dialog with a text message. You can edit this text message with your own.

Each time a brush is used to paint a dab of paint, the Source Brush is computed dynamically from one of the individual letters in the Text Brush message. Which letter is used to generate the Source Brush depends on the settings in the Position Mod control. Letter positioning can be dynamically modulated in real time or cycled sequentially.

Style/Font

Determines the style and the specific font used for the text brush.

Size

Determines the size of the text brush source.

Position Mod

Determines how the current letter positioning in the source text is modulated.

Movie Brushes

This brush dynamically generates the Brush Source from the individual frames in a QuickTime movie located on your hard disk. You can load a new brush movie file by using the "New Movie Brush..." menu located in the "File" main menu. The brush file name, size, and a frame of the brush itself are displayed. A brush movie file is a QuickTime movie. Each frame of the movie can be used as a unique Brush Source that can be dynamically varied as you paint.

To choose a new movie file as the Source Brush, use the "File : New Movie Brush..." menu command. Use common sense when specifying a particular QuickTime movie as a Source Brush. Choose a movie with frame dimensions appropriate for use as a brush source image. Depending on the settings in the Brush Modulation pane, many copies of a given movie frame will be generated in memory.

When loading a new Paint Patch, if Studio Artist can't find the brush movie file originally specified, it will do two things. First, it will see if there is a brush file of the same name in the Brush folder located adjacent to the Studio Artist application on your hard disk. If it can't find a file with the same name in that folder or any of it's subfolders, Studio Artist will then bring up a Standard File dialog so that you can manually specify the location of the Source Brush movie file.

In general, you should keep your various movie brush files in the Brush folder located next to the application. Taking the time to manage your movie brushes in this fashion will make moving between different machines and hard disks much easier.

Frame Mod

Determines how the current frame positioning in the movie is modulated.

Brush Type

The actual brush used for painting is the result of the interaction between the current Brush Source and the specific brush generation algorithm specified here. Studio Artist has the ability to create modulatable brush texture on the fly to generate a dynamic brush that can interactively change depending on how you paint or draw. Typically, the Brush Source is used as a mask for a dynamic algorithmic texture generator.

Brush Type

Specific brush generation algorithm

Source Brush
Just use the Source Brush as the paint brush.

Stretch Source Brush
Stretches the Source Brush along the path.

Stretch1 Source Brush
Stretches the Source Brush along the path while performing an area fill.

Procedural Stretch
Like a stretch brush but filled with algorithmic texture
Procedural Brush
Typically the most popular brush algorithm. The dynamic algorithmic texture can interact with the Source Brush in different ways depending on the Brush Op setting.

Geodesic Circular
Geodesic Rectangular
Algorithmic brushes that don't use the source brush. Good for a certain kind of fractal texture look, simulation of capillary bleed, or certain unique stylistic effects.

Computational Stretch
Algorithmic brush like the computational source brush that is stretched dynamically along the path.

Specific Brush Generation Parameters

Stretch1 Source Brush

Orient Type

Determines the orientation modulator for the stretching source brush.

Orient Offset

Specifies an angle offset for the orientation modulator.

Procedural Stretch
Procedural Brush

Orient Type

Determines the orientation modulator for the procedural texture generator.

Orient Offset

Specifies an angle offset for the orientation modulator.

Clip

Specifies **maximum clipping for procedural texture.**

Clip Mod

Specifies **modulator source for clipping.**

Random Start

Determines if the procedural texture generator always starts from the same or a random set of initial conditions for each path.

Brush Op

Specifies the interaction between the generated brush texture and the Source Brush.

Turb Levels

Specifies the number of octaves of turbulence in the procedural texture generator.

Turb Alg

Determines the specific texture generator algorithm used to dynamically generate brush texture.

Path Len Inc

Specifies the texture scaling along the direction of the path.

Path Width Inc

Specifies the texture scaling perpendicular to the path.

Geodesic Circular
Geodesic Rectangular

Bias / Gain

Define a luminance transfer function for the geodesic brush algorithm.

Max Count

Determines the maximum size of the geodesic brush.

Random Count

Specifies the random indexing associated with the geodesic brush algorithm.

Iterations

Specifies the number of iterations or repeats for the geodesic brush algorithm. This parameter will tend to multiply the actual size of the brush Canvas coverage.

Computational Stretch

Orient Type

Determines the orientation modulator for the stretching computational brush.

Orient Offset

Specifies an angle offset for the orientation modulator.

Bias / Gain

Define a luminance transfer function for the computational brush algorithm.

Brush Modulation

Determines how the brush size and orientation is modulated. The different size and orientation brushes are generated from the Source Brush.

 # Brush Sizes

How many different size brushes are generated

Size Mod

Determines a modulation source for the brush size

Brush Size Range

Specifies minimum and maximum size brushes as a percentage of the Source Brush Horizontal and Vertical dimensions.

Interpolation

Type of interpolation algorithm used to generate different size brushes.

 # Brush Orients

How many different orientation brushes are generated

Orient Mod

Determines a modulation source for the brush orientation

Angle Variation

Determines the maximum orientation modulation amount.

Angle Offset

Determines an initial orientation offset for brushes.

Background Texture

The background texture is typically used to modulate a paint fill

operation based on a texture. The texture can either be algorithmic or based on an image file. The texture can be static or dynamic depending on the parameter settings. The texture can be used for things like simulating textural properties of media, or as a second texture source to modify the algorithmic brush.

Texture Type

Procedural is an algorithmic texture. Image is based on a source image that is replicated according to a user definable symmetry or mosaicing pattern to cover the canvas.

Procedural Textures

Orient Mod

Modulation source for the orientation of the texture. Fixed is static. The others allow for dynamic textures.

Orientation
Size
Directionality

Determines the spatial appearance of the texture.

Horz/Vert Offset

Determines a spatial offset for the texture.

Random Start

New texture for each paint stroke if checked.

Invert

Grayscale inversion of the background texture.

Turb Alg

Type of turbulence algorithm.

Turb Levels

# of octaves of turbulence.

Bias/Gain

Mapping transform for the texture.

Image Textures

Orient Mod

Modulation source for the orientation of the texture. Fixed is static. The others allow for dynamic textures.

Orientation

Determines the spatial orientation of the texture.

Horz/Vert Offset

Determines an initial spatial offset for the texture.

Random Start

New texture offset for each paint stroke if checked.

Invert

Grayscale inversion of the background texture.

Bias/Gain

Mapping transform for the texture.

H Sym

Specifies a horizontal symmetry operation for replicating the source texture image.

V Sym

Specifies a vertical symmetry operation for replicating the source texture image.

Miscellaneous

Anything we couldn't figure out where else to put.

Autodraw Pres

Algorithm to generate pressure information when autodrawing.

Allows for paint patches that work with a pressure sensitive pen to still modulate their appearance during autodraw actions.

Auto Pres Range

Minimum and Maximum range values for the Autodraw Pressure algorithm..

Region Draw

Parameters used in interactive region draw mouse mode. User interactively specifies a region on the canvas that is then filled with algorithmically generated paint strokes.

Fill Type

Algorithm to generate a path to fill an interactively specified region. The first 10 fill types are also accessible via hot keys 1,2,...,0 when in Region Draw mouse mode.

Region Spacing

Spacing used in the Region Draw fill algorithm.

Global Evolution

This pane can be used to algorithmically generate new paint patches. You can morph two different paint patches or evolve new patches through selective random evolution. You can automatically redraw the current bezier layer with a newly generated patch if the Redraw Bez Layer checkbox is on.

Interactive Morph

Specifies a modulation source to dynamically morph between the two different paint patch memories Patch 1 and Patch 2 while drawing. Be aware that this is a very modal operation that overrides all of the current paint parameters while drawing if turned on.

Patch 1 / Paint 2

Two different paint patch memories. Option click to record the current paint parameter settings, Click to set the current paint parameters to the settings in the memory.

Patch Morph

Use the slider to morph or generate a tween patch from Patch Mem1 and Patch Mem 2.

Mingle

Generates a new patch by mingling parameters from Patch Mem1 and Patch Mem 2. The morph slider value determines the mix of the parameters from the two patch memories.

Redraw Bez Layer

Will redraw the current bezier path layer with the current paint parameters anytime they are changed by a morph or mutate operation.

Randomize

Randomize the current patch parameters based on the current Mutate settings. Uses the Spread setting to determine the percentage of paint parameters changed in a given mutation cycle.

Spread

Percentage of paint parameters changed in a given mutation cycle.

Chapter 4: Image Operations

Image Operations are a set of image processing filters or processes that each have unique parameter panes. They act to transform the current canvas. Some image operations may also be modifiable by current visual attributes, global paint color memories, or the current region. The current image operation is initiated by pressing the **Action** button, or by choosing the "**Do Current Action**" menu, or by the key shortcut **Cmnd-Spacebar**.

Each image operation also has a compositing operation and mix control located at the bottom of the parameter pane. The use of different compositing operators can totally change the effect of a given image operation, resulting in a manyfold increase in possible visual effects achieved with a given image operation. You can also specify a specific number of repetitions of a particular image operation.

Paint Action sequences can be used to combine together different image operations to generate complex visual processes. You can use Paint Action Presets to access these operations at the touch of a button.

Generic Image Operation Parameters

Certain image operation parameters are available for all image operations. They allow for mixing or compositing the effect image with the original canvas image, and specifying repetitive image operations.

The final output of the image operation is the result of the compositing operation. Depending on the particular compositing operation specified, the resulting visual effect can be totally transformed from the original image operation. This greatly increases the range of possible visual effects available from a single image operation. For example, specifying an **Edge1** compositing operation on an image operation that blurs the Canvas image will generate a sharpening visual effect.

Mix

The percent amount of mix between the output of the compositing operation and the original Canvas image.

Composite Op

Specifies a compositing operation that takes the original source image and the effected source image and algorithmicly combines them in some specified fashion.

Repetition

The percent amount of blur.

Blur

Performs a softening blur operation on the Canvas image.

Blur Amount

The percent amount of blur.

ColorSpace

The color space the blur is performed in.

ColorQuant

Quantizes or reduces the number of colors in the Canvas image to a fixed amount.

Number of Colors

The number of colors to quantize to.

ColorSpace

The color space the operation is performed in.

Variation

Adaptive chooses colors to best represent the image. Uniform subdivides the entire colorspace uniformly without taking the image into account.

ColorEdge

Generates a colored thin edge rendition of the Canvas image.

Smoothing

Increasing the Smoothing gives a smoother edge rendition that is less susceptible to noise. Decreasing Smoothing gives more edge information but also is influenced by image noise.

Colorize

Generates a colorizing special effect. Uses the Canvas image as the color source for the effect.

Source

The image attribute used as a source to be colorized by the Canvas image.

ColorSpace

The color space the operation is performed in.

ConvexHull

Generates a complex hull, which is a type of nonlinear morphological image operation.

Size

The spatial extent of the operation.

Variation

The type of nonlinear operation used when computing the complex hull.

Convex Alg

The particular algorithm used when computing the complex hull.

Fracture

Generates a series of random symmetry fractures of the Canvas Image.

Number of Random Starts
The number of random fractures generated in the operation.

Algorithm
The particular fracture algorithm.

ColorSpace
The color space the operation is performed in.

Mode
Specifies the type of symmetry associated with the fracture.

Fracture Displacement

Generates a series of random area fractures of the Canvas Image. Each fractured area is then randomly displaced.

Number of Random Starts
The number of random fractures generated in the operation.

Displacement Amount
The maximum amount of random displacement within a fracture area.

Displace
Specifies whether the Displacement Amount is in pixels or percent of the Canvas dimensions.

Algorithm
The particular fracture algorithm.

ColorSpace
The color space the operation is performed in.

Geodesic Displacement

Generates a geodesic area sampling of the Canvas Image. Each area is then randomly displaced.

Number of Random Starts

The number of random starts in the operation.

Displacement Amount

The maximum amount of random displacement within a growth area.

Random Count

Geodesic random count.

ColorSpace

The color space the operation is performed in.

Geodesic FX

Generates a geodesic special effect.

Number of Starts

The number of random starts in the operation (times 20).

Iterations

The number of iterations run in the effect.

Geodesic Growth

Generates a geodesic area sampling of the Canvas Image, and then fills that area with the sampled Canvas color.

Number of Iterations

The number of iterations in the operation.

Number of Random Starts

The number of random starts in each iteration.

Random Count

Geodesic random count.

Geodesic Interpolation

Interpolates the Canvas image to fill in a background area.

Number of Iterations
The number of iterations in the operation.

Gate
Specifies a gating range for the background color.

Background
Background color to fill in.

Geodesic Recursive Growth

Generates a geodesic area sampling of the Canvas Image, and then fills that area with the a recursively modulated Canvas color.

Number of Iterations
The number of iterations in the operation.

Number of Random Starts
The number of random starts in each iteration.

Random Count
Geodesic random count.

Recursive Feedback
Amount of recursive feedback.

Geodesic Rings

Generates a geodesic area sampling of the Canvas Image, and then fills that area boundaries with a sampled Canvas color to generate rings.

Number of Random Starts
The number of random starts in one iteration.

Number of Iterations
The number of iterations.

Geodesic Variator

Interpolates the Canvas image to fill in a background area.

Alpha

The recursive mix.

Number of Iterations

The number of iterations.

Background

The background to be filled.

Blend Option

What the operation does to the background.

Gradient

Generates a lighting gradient based on the Canvas image.

Angle

The angle of the lighting source.

Elevation

The elevation of the lighting source

Width

The width of the effect.

ColorSpace

What colorspace the operation is performed in.

Variation

Specifies the type of gradient.

Block Abstraction

Abstracts the Canvas image as a series of colored blocks. The algorithm is smart and tries to position the blocks to best represent the original image and it's edges.

Complexity

Decreasing the Complexity generates fewer colored blocks. Increasing

the complexity generates more colored blocks that better represent the original image edges.

Image Compressor

Smart adjustment of the Canvas image. Acts like an audio compressor on images that maximized signal gain (not to be confused with data compression algorithms that throws away information)

Local Adaption

Specifies the amount of local adaption

Gain

Bias

Mode

Attribute options for processing.

Invert

Inverts the Canvas image.

ColorSpace

Specifies the colorspace the operation is performed in.

Combination

Specifies options for which colorspace components are processed.

Line Screen

Smart line screen algorithm.

Screen Size

Specifies the size of the screen to be modulated.

Modulation Offset
Specifies an angle offset for the modulator.

Mod Source
Specifies the modulator source.

Variation
Colorspace variation for processing.

Mod Option
Option for modulator algorithm.

Screen Option
Option for screen algorithm.

Morphol

A number of different nonlinear morphological operations.

Algorithm
Specifies a particular morphological algorithm.

ColorSpace
Specifies the colorspace the operation is performed in.

Oil Painter

A special effect that give a particular oil paint look to the Canvas image.

Number of Random Starts
Specifies the number of random starts for the algorithm.

Number of Iterations
Specifies the number of iterations for the algorithm.

Random Block Exchange

Randomly exchanges area blocks within the Canvas image.

Number of Exchanges

Specifies the number of block exchanges.

# of Horizontal Blocks

Specifies the number of horizontal blocks.

# of Vertical Blocks

Specifies the number of vertical blocks.

Rank Line Filter

Allows for the application of a number of different nonlinear rank filters to the Canvas image.

Size

Specifies the spatial extent of the rank filter.

Angle

Specifies the angle of the rank filter.

Algorithm

Specifies the particular rank filter algorithm used in the operation.

ColorSpace

Specifies the colorspace the operation is performed in.

Rank Edge Filter

Generates a nonlinear edge effect that is based on rank filtering. Can be used to generate colored edges or more complex edge-related effects that delineate positive and negative space in the Canvas image.

Low Size

Specifies the minimum spatial extent of the rank filter.

High Size

Specifies the maximum spatial extent of the rank filter.

Rank Type

Specifies the particular type of rank filter algorithm used in the operation.

Variation

Specifies different variations of the effect.

Simple Texture

Fills the Canvas image with a simple algorithmicly derived texture field.

Angle

Orientation angle of the texture field.

Directionality

Specifies the directionality of the texture field.

Scale

Specifies the spatial scale of the texture field.

Algorithm

Specifies different algorithms to generate the texture field.

Octaves

Specifies the number of octaves of spatial texture in the texture field.

Color Var

Specifies different color variations for the generated texture.

Smart Blur

Adaptively blurs the Canvas image in an intelligent way based on a specified visual attribute.

Displace Amount

Specifies the spatial extent of the blur.

Angle Offset

Specifies an angle offset for the smart blur calculation.

Variation

Specifies different color and attribute variations for the smart blur.

Mode

Specifies different algorithm variations for the smart blur.

Smart Contrast

Intelligent contrast effect that works at three different spatial frequencies simultaneously. Can be used to accentuate positive and negative space, as an adaptive hard contrast effect, or to generate comic-book like effects.

Smoothness 1

Specifies the spatial frequency of contrast channel 1.

Smoothness 2

Specifies the spatial frequency of contrast channel 2.

Smoothness 3

Specifies the spatial frequency of contrast channel 3.

Threshold

Useful to reduce the effect of noise on the contrast image.

Variation

Specifies different algorithm variations.

Smart Contrast1

Another intelligent contrast effect that works at three different spatial frequencies simultaneously. Can be used to accentuate positive and negative space, as an adaptive hard contrast effect, or to generate comic-book like effects.

Smoothness 1

Specifies the spatial frequency of contrast channel 1.

Smoothness 2

Specifies the spatial frequency of contrast channel 2.

Smoothness 3

Specifies the spatial frequency of contrast channel 3.

Threshold

Useful to reduce the effect of noise on the contrast image.

Original Source Mix

Mixes the source into the three channel mix prior to the contrast generation.

Variation

Specifies different algorithm variations.

Smart Displace

Intelligent displacement effect that locally adapts based on specified visual attributes.

Displace Amount

Specifies the amount of displacement.

Angle Offset

Specifies an offset angle for the smart displacement modulator.

Variation

Specifies colorspace and visual attribute combinations.

App Mode

Specifies an application mode that composites the original image with the displaced image.

Disp Mode

Specifies different displacement algorithms.

Sparse Interpolation

Interpolates the Canvas image to fill in a background area.

Subdivision

Decreasing the subdivision increases the spatial extent of the interpolation and vice versa.

Background

Specifies the background color to fill in.

Sphere Multiplier

Multiplies the Canvas image with a spherical luminance mask. Useful as a border effect or when generating a paint brush source image in the

Canvas.

Gain

Specifies the sphere algorithm Gain.

Bias

Specifies the sphere algorithm Bias.

Corner Pull

Decreasing from 100% pulls the sphere corners into the center of the Canvas. Increasing from 100% pulls the sphere into the Canvas corners.

Chapter 5: Helpful Hints

Designing a Paint Strategy

Before you start editing a new paint patch, take a moment to plan out a paint strategy to aid in your patch design. A paint patch is composed of a series of parameters that define paths, paint source, paint and brush characteristics. Your strategy should take into account how these parameters interact as well as the paint look you are trying to achieve.

What are your goals? Are you designing a paint that will be used under user control with an interactive pen, or one that will autodraw without user supervision. Will you start your drawing from a fixed color background? Should the paint be wet or dry?

How you answer these questions will determine how the vast number of various editable parameters available within Studio Artist should be adjusted. Each parameter needs to be carefully chosen to match the specified goals of your paint strategy.

Designing a Custom Art Process

Paint Action Sequences can be built to implement custom art processes that are accessible at the touch of a button. An art process may be composed of several different steps that combine together to generate a final effect or artistic look. These steps may emulate traditional real world tools and techniques, or generate totally new looks.

One example of an emulative art process might be a custom water color paint effect. In the real world, you might start with a textured paper and apply a background wash with a large brush. Then you might fill in details with a finer brush. Detailed edges might then be

drawn with a fine black line. This series of painting steps could be thought of as a watercolor paint process.

To emulate this example watercolor paint process within Studio Artist, each step must be broken down and defined by a Paint Action or series of Paint Action steps. The Paint Action Sequence is an editable list of all of the individual Paint Actions recorded step by step. The resulting sequence can be applied to any source image, or may be totally algorithmic and unique with each application. It all depends on how the sequence is defined.

In the example above, the textured water color paper could be simulated by designing a background texture in the paint synthesizer. There are a number of ways to do this.

You could adjust the settings on the **Background Texture** parameter pane to simulate a particular paper texture. Or, you could scan a real texture and load that into the Background Texture as an image texture. Or, you could build a Paint Action that applies a random brush to the canvas with a random scan pattern. Or, you could build a series of image processing steps that generate a textured Canvas. This Canvas could then be loaded into the current region, and used to modulate the **Paint Fill**.

There are a large number of factory presets that could be used to generate a blurry watercolor background wash. The brush size could then be adjusted to provide a smaller, harder edge brush. The Path Start and Path End parameters could be set so that autodrawn paths would follow the source image edges. Path length and brush size could be reduced again for more detail rendition. The paint source color could be switched to black for the fine detail edge black lines. Then, a Canvas Spread Water Preset could be chosen for a final water wash.

Using Evolution to Generate New Paint Patches

Studio Artist provides several ways to evolve new paint synthesizer

patches from existing ones. Use the "**Operation : Global Evolution**" menu to go access the Paint Synthesizer controls associated with patch evolution. You can randomly generate variations off of a single paint patch, as well as morph or mingle two different paint patches. Morphing or mingling can either be randomly generated, adjusted with a slider, or modulated with any interactive modulation parameter (like pressure or tilt).

If you have some Bezier paths in the current Bezier frame, you can have Studio Artist autodraw these paths every time you evolve a new paint patch.

Using Layers to Visualize Paint Edits

Suppose you want to edit a paint patch and test out your edits without ruining an existing painting in progress. Simply generate a new layer, and then use the new layer as a scratch pad for patch editing. You can build a series of pressure modulated paths, and then autodraw the paths in the new layer to automatically test out your paint parameter edits. Switch back and forth between your scratchpad layer and your original art layer depending on whether you are editing a paint patch or doing active drawing.

You can also use a second layer as a way to mix paint colors like an artist would mix colors with real paint. Try this out with a wet paint patch. The dynamics of the wet paint and several different initial paint colors will generate a rich source of color variability. To move the Canvas color back to the color source, use the '**c**' hot key when mousing down in the Canvas. You can save a specific color in one of the color memories by option clicking them (click them to play back a saved color). Or, you can transfer the entire Canvas to the Source with a menu command.

Alternative uses for the Source Image

The Source Image can be used in many different ways. Typically,

Studio Artist uses the Source Image the way an Artist would use a model, as a source of visual abstraction. However, there are other ways to utilize the Source Image.

One alternative approach is to use the Source Image as a way to generate a paper or media texture. Choose an appropriate textured image as the source. You can then build paint patches that use the source image to modulate paint fill, or influence autodrawing to bring out the simulated paper or media texture.

Another approach is to use the Source Image to generate custom brush images on the fly. You can use the Paint Source Offset parameters to literally paint with chunks of texture from the Source Image.

You also have the ability to import individual paint attributes (like color, edges, or orientation) from different source images. This is a way to mix and match visual features from several different images into a unique hybrid source image.

How to Visually Abstract the Source Image

Some Artists may feel limited by the use of a Source Image, feeling that it forces their personal art onto a representational path they might not have personally chosen. Using the Source Image as a source of media texture is one approach to this issue. However, you can work with the Source Image as a creative tool in it's own right, subverting it's representational focus for your own purposes.

One approach is to start with a representational source image, and then subvert it in some way, until its totally changed into something new and different. Paint Actions, Interactive Warps, or a series of Image Operations can be used to radically change the Source image in the working Canvas. Selective interactive warping is a great way to radically transform an initial image into something very different.

The Canvas can then be loaded into the Source image using the "**Canvas : Canvas Image to Source Image**" menu. The old Source

Image will be replaced by the working Canvas, and the Studio Artist intelligent visual attributes will be recalculated from the new transformed Source Image.

Repeating this process several times can generate a Source Image that is totally unique and personal, something quite different from the representational image that started the process. This unique Source Image can then be used as a starting point for further Studio Artist Operations.

Knowing When to Stop Painting

Using Action in the Paint Synthesizer is a great way to automatically generate finished paintings at the touch of a button. However, keep in mind that just like in the real world, the key to a good final image may be knowing when to stop painting.

Many of the factory Presets are configured to paint for a very long time if left to autopaint on their own. These patches were designed with the idea that you as an Artist will be watching Studio Artist work and stop an Action at an appropriate aesthetic moment.

Often, the key to a successful final image may be to combine together several different Paint Actions that work together to achieve a desired visual effect. You can use Studio Artist's Paint Action Sequences to record a series of Paint Action autopainting steps and then access them as a one click autopainting operation.

Using a Movie to Generate a Series of Still Paintings

Studio Artist's various methods for generating movie output are great for generating motion animation or video effects. However, they are also of use for conventional artists that just want to generate a static image.

Think of a movie as a collection of individual images or paintings. The

various movie generation methods provide a way to auto-generate a series of individual paintings as a batch process. After the series of still paintings is generated, an artist can single step through the resulting movie and save individual frames as static images.

Using QuickTime Movies to Build Dynamic Brush Masks

Studio Artist has the ability to build dynamic paint source brushes based on QuickTime movies. The individual frames of a movie can be used to simulate the interaction of a brush with media. Interactive modulators like pen pressure or tilt can be used to index through the frames of the movie brush in real time to generate a dynamic brush source mask.

You can design your own paint brush movies by using Studio Artist's Movie generation features. To paint your own brush movie, use the "**Start Movie to File...**" menu to specify a destination movie file on your hard disk. Then, hand paint the individual movie frames. After you are done with each individual frame, output it to the active movie file using the "**Write Canvas as Movie Frame**" menu. When you are done with the last frame, use the "**Stop Movie to File**" menu command to finish off the movie.

Typically, you'll want to paint on a Canvas that is a larger size than the final movie brush size so you have more control over rendering detail in the individual frames. You can use Studio Artist's movie processing capabilities to convert the initial larger dimension brush movie to the final smaller anti-aliased brush movie.

To convert the size of a QuickTime movie, you need to generate a simple Paint Action Sequence that will be applied frame by frame to process the larger dimension movie into a smaller dimension movie.

Use the "**Action : Paint Action Window...**" menu to bring up the Paint Action Window. Click the Erase button in the window to erase any existing Paint Action Sequence steps. Turn on recording by clicking the **Record** checkbox if it is not turned on already. Change the Canvas

Background popup (located above the Canvas to the right) to "**Image**". You should see a "Set Paint Background" Paint Action appear in the Paint Action Sequence list. Turn off recording by unchecking the **Record** checkbox.

Now, you are ready to apply your simple Paint Action Sequence to the initial brush movie by using the "**Movie : Process Movie With PASeq...**" menu. First, you'll need to choose your source movie using the find file dialog. Then, you'll need to set the output movie resolution with the Set Canvas Size dialog. For this example, you'll set the output movie size to the final smaller canvas dimension desired for the final brush movie. Finally, you need to specify the output movie file name and location on your hard disk with another standard file dialog.

Now, the Paint Action Sequence you built will be applied frame by frame to the initial source movie. The simple sequence you specified generators a reduced size, anti-aliased output movie. If you had specified a more complicated series of Paint Actions (for example, a series of image processing operations), the resulting series of actions would have been applied to the source movie frame by frame as well.

Support for the advanced features of Wacom Graphics Tablets

Wacom graphics tablets have several advanced features including integral erasers, pen tilt, tool id, tangential pressure via the Airbrush wheel, and the 4D mouse. Studio Artist supports all of these advanced features in a number of innovative ways.

Any of the Wacom interactive controls (pressure, tilt, pen orientation, tangential pressure, mouse wheel, mouse orientation) can be used to modulate one or more paint synthesizer parameters to generate expressive interactive paints patches. Using global evolution paint patch morphing, over 200 individual paint parameters can be modulated in real time if desired for interactive expression overload!

Pen pressure is used throughout the Studio Artist interface to provide

dynamic control over interactive operations like image warping, region drawing or selection. Pen tilt is also integrated into the interface as an integral intuitive fashion to define and rotate path curves or selection regions.

Using the Wacom Pen eraser

Many Wacom pen tools have a built in eraser opposite the pen tip. While drawing, you can flip the pen and erase what you have drawn. Studio Artist support this feature, but also allows you to choose which paint patch is used when you flip the pen and erase.

The current eraser patch is stored in the eraser paint memory. To record a new eraser paint patch, Option click the eraser paint patch memory. The current paint synthesizer settings will then be stored in the eraser patch memory.

Using multiple Wacom Pens

Wacom's Intuos tablets support the use of multiple pen tools. Each pen or tool has a unique id that Studio Artist can sense. A specific pen can be associated with anyone of the four paint patch memories.

Remember that after you associate a specific pen or tool with a specific paint memory, it will be a modal tool that only paints with the specific settings stored in the paint patch memory.

To associate a specific tool with a specific paint patch memory, Command-Option click the memory. To de-associate the tool with the memory, Command-Shift-Option click the memory.

Chapter 6: Menu Commands

This chapter contains detailed explanations for all of the various Studio Artist menu commands.

Main Menus

The main Studio Artist menus are organized according to the following categories:

File
Edit
Canvas
Path
Action
Movie
Operation

Each of these main menu categories will be explained in more detail in the following sections.

File

Menu commands associated with file access for the Source Image, Canvas Image, Paint Patches, or Workspace are located here. Preferences and printing menus are also accessed here.

Edit

Menu commands associated with editing selected objects are located here.

Canvas

Menu commands associated with the Canvas are located here. This includes access to the Canvas Layers Window and commands.

Path

Menu commands associated with Bezier Paths and the current Bezier Path Layer are located here. This includes file access to the current path layer.

Action

Menu commands associated with Studio Artist's Actions and Action Sequences are located here. This includes the Paint Action Sequence window, it's associated commands, and file access as well as the History Sequence window, it's associated commands, and file access.

Movie

Menu commands associated with Studio Artist's Movie and Animation features are located here. This includes movie and animation generation, canvas RAM movies, and movie filtering or processing.

Operation

The Operation menu commands allow for quick one step navigation to any of the Studio Artist control panes associated with particular modal Operations.

File

The following menu commands are accessible from the File main menu:

New Source Image and Canvas...
Open Source Image…
New Image Brush...

New Movie Brush...
New Background Image Texture...
Save Canvas Image As...
Import Image to Canvas..
Import Image to Attribute
Import Paint Patch ...
Export Paint Patch ...
Import Workspace...
Export Workspace...
Preferences...
Page Setup...
Print...
Quit

Each of these File menu commands will be explained in more detail in the following sections.

New Source Image and Canvas...

This menu command allows you to choose a new Source Image and define a new working Canvas. Your existing Canvas will be erased when you execute this command. You will be prompted to save your existing work if you haven't already.

The "Canvas" is the image you are painting, editing, manipulating, etc. The "Source" is located in the top left corner of the screen, and is the source of the visual attributes used by the program for intelligent-assisted drawing. Studio Artist does not modify your Source Image in any way.

Choose your new Source Image from the hard disk with the Standard File dialog. After you click OK, a new dialog will appear that allows you to define the dimensions of your new Canvas work area. The Canvas does not have to be the same size as the Source Image. Typically, the Canvas may be set larger than the Source Image.

Open Source Image…

This menu command allows you to choose a new Source Image. The Source Image is the source of the visual attributes used by the program for intelligent-assisted drawing. Studio Artist does not modify your Source Image in any way. The working Canvas will not be changed in any way when you open a new Source Image.

New Image Brush...

This menu command allows you to choose a new Paint Synthesizer Brush Source Image. Choose your new Image Brush from the hard disk with the Standard File dialog. After you click OK, the Brush Source popup will be switched to "Image" and your new Image Brush will be loaded as the active Source Brush.

Exercise common sense and choose a reasonable size Image Brush. Depending on the Brush Modulation settings in the Paint Synthesizer, Studio Artist could be generating hundreds of modified copies of the Image Brush.

New Movie Brush...

This menu command allows you to choose a new Paint Synthesizer Brush Source Movie. Choose your new Movie Brush (which is a QuickTime movie file) from the hard disk with the Standard File dialog. After you click OK, the Brush Source popup will be switched to "Movie" and your new Movie Brush will be loaded as the active Source Brush.

Exercise common sense and choose a reasonable size Movie Brush. Depending on the Brush Modulation settings in the Paint Synthesizer, Studio Artist could be generating hundreds of modified copies of the Movie Brush.

New Background Image Texture...

This menu command allows you to choose a new Paint Synthesizer Background Image Texture. Choose your new Image Texture from

the hard disk with the Standard File dialog. After you click OK, the Background Texture "Texture Type" popup will be switched to "Image" and your new Image Texture will be loaded as the active Background Image Texture.

Save Canvas Image As...

This menu command allows you to save the current Canvas image as an image file on your hard disk. Choose a name, image format, and desired location for the saved file on your hard disk with the Standard File dialog.

Import Image to Canvas..

This menu command allows you to choose a new Starting Image for your working Canvas. Your existing Canvas will be replaced by the imported image when you execute this command. The new working Canvas will be resized to the dimensions of the imported image. You will be prompted to save your existing work if you haven't already.

You may wish to set the Canvas background to a specific image without changing your existing Canvas size, or losing your other Canvas layers. To do this, first Open a new Source image. Then, use the Canvas background popup and change it to Image. The new Source Image will be loaded into the existing working Canvas.

Import Image to Attribute

This menu command allows you to import specific visual attributes from image files on your hard disk. The existing chosen Source Image visual attribute will be replaced by a new visual attribute generated from the chosen import image.

Import Paint Patch ...

This menu command allows you to import a new Paint Synthesizer Patch from a Patch file on your hard disk. A paint Patch is a complete set of Paint Synthesizer parameters. Choose your new Paint Patch

from the hard disk with the Standard File dialog. After you click OK, the imported Paint Patch will be loaded as the current Paint Preset.

Export Paint Patch ...

This menu command allows you to export a new Paint Synthesizer Patch to your hard disk. A Paint Patch is a complete set of Paint Synthesizer parameters. Choose a name and location for your new Paint Patch on the hard disk with the Standard File dialog. Clicking OK will save the current Paint Synthesizer settings to the hard disk as a Paint Patch file.

Import Workspace...

This menu command allows you to import a new Studio Artist Workspace from a Workspace file on your hard disk. A Workspace is a complete set of all of the current settings for the various memories located within Studio Artist as well as additional information like window locations. Choose your new Workspace from the hard disk with the Standard File dialog. After you click OK, the imported Workspace will be loaded as the current Workspace Preset.

Export Workspace...

This menu command allows you to export a new Studio Artist Workspace to your hard disk. A Workspace is a complete set of all of the current settings for the various memories located within Studio Artist as well as additional information like window locations. Choose a name and location for your new Workspace on the hard disk with the Standard File dialog. Clicking OK will save the current Workspace settings to the hard disk as a Workspace file.

Preferences...

This menu command brings up a dialog that allows you to choose new Preference settings for Studio Artist. If you change any Preference settings and click OK, the changes you have specified will not take

place until the next time you restart the application.

Page Setup...

This menu command brings up a dialog that allows you to choose Page Setup settings for printing from Studio Artist.

Print...

This menu command brings up a dialog that allows you to print the current working Canvas.

Quit

This menu command allows you to quit the Studio Artist application.

Edit

The following menu commands are accessible from the File main menu:

Undo
Cut
Copy
Paste
Clear
Select All
Deselect All
Invert Selection
Connect Two Curves
Flip
Rotate
Preset
Randomize Current Paint Settings

The standard editing commands (Copy, Paste, etc.) are context sensi-

tive and act on individual objects in the interface. One specific area in the user interface will be the active interface element at any given moment. You can mouse down in a specific interface element to activate it.

For example, if you are editing a text edit field and select some text, the standard editing commands will act on your selected text. If you then select a Bezier path in the Canvas, the standard editing commands will switch their context as the Canvas becomes the active interface area. The standard editing commands will then act on your selected Bezier curve.

Each of these Edit menu commands will be explained in more detail in the following sections.

Undo / Redo

This menu command allows you to Undo and Redo your last Studio Artist operation. The menu toggles from Undo to Redo depending on what you did last.

Studio Artist currently supports one level of Undo accessible from this menu. You can use your Paint History to implement a form of unlimited Undo. The History Window (accessible from the Action menu) allows you to play back and edit your entire Studio Artist session.

Cut

Removes selected objects from their interface location and places them in the clipboard.

Copy

Copies selected objects from the interface and places them in the clipboard.

Paste

Copies any objects in the clipboard into the currently active interface area.

Clear

Removes selected objects from the interface.

Select All

Selects all objects in the active interface area.

Deselect All

Deselects all selected objects in the active interface area.

Invert Selection

Inverts the current object selections in the active interface area.

Connect Two Curves

This command is only active if two Bezier paths are selected in the Canvas. Executing the command will attach the two selected curves at their closest end points.

Flip

These menu commands flip the selected objects in the specified fashion.

Rotate

These menu commands rotate the selected objects in the specified fashion.

Preset

These menu commands access specific edits associated with the current Preset.

Randomize Current Paint Settings

This menu commands will randomize the current Paint Synthesizer parameters according to the settings in the Paint Synthesizer Global Evolution parameter pane.

Canvas

The following menu commands are accessible from the Canvas main menu:

Layer Window...
Layer Commands
Zoom Out Canvas
Zoom Into Canvas
TextBrush Source...
ReRender Canvas...
Canvas Image to Source Image
Canvas Image to Current Region
Invert Current Region
Canvas Image to Blanking
Source Image Edges to Blanking
Reset Blanking

Each of these Canvas menu commands will be explained in more detail in the following sections.

Layer Window...

This menu command allows you to open the Layer window. Each Canvas Layer is displayed as an element in an editable list in the Layer window.

Layer Commands

This menu command allows you to execute different commands associated with Canvas Layers. The individual commands are accessible via the sub menu.

Zoom Out Canvas

This menu command allows you to zoom out (or demagnify) your view of the current Canvas.

Zoom Into Canvas

This menu command allows you to zoom in (or magnify) your view of the current Canvas.

TextBrush Source...

This menu command brings up a dialog that allows you to specify a new text string that will be drawn by the Text Source Brush.

ReRender Canvas...

This menu command allows you do rerender the Canvas to a different size or resolution. You can rerender the existing Canvas via image interpolation as well as rerender the existing Paint History and it's associated Path and Paint Synthesizer settings. Playing back the rerendered Paint History will re-execute all of your session operations at the new resolution. This is a way to repaint your new sized Canvas with increased detail.

Canvas Image to Source Image

This menu command allows you to copy the current Canvas into the Source Image.

Canvas Image to Current Region

This menu command allows you to copy the current Canvas into the Current Region.

Invert Current Region

This menu command allows you to invert the Current Region.

Canvas Image to Blanking

This menu command allows you to copy the current Canvas into the Blanking Frame.

Source Image Edges to Blanking

This menu command allows you to generate a Blanking Frame from the Source Image Edges.

Reset Blanking

This menu command resets the Blanking Frame.

Path

The following menu commands are accessible from the Path main menu:

Paint Path Layer
Reverse Paint Path Layer
AutoPaint Path Layer
Paint Selected Path
Expand Path Layer
Canvas Edges to Path
Source Edges to Path
Delete Path Layer
Import Path Layer...

Export Path Layer...
PathLayerRecord

Each of these Path menu commands will be explained in more detail in the following sections.

Paint Path Layer

This menu command repaints the current path frame paths in order with the current Paint Synthesizer settings.

Reverse Paint Path Layer

This menu command repaints the current path frame paths in reverse order with the current Paint Synthesizer settings.

AutoPaint Path Layer

This menu command autopaints the current path frame paths with the current Paint Synthesizer settings.

Paint Selected Path

This menu command repaints the selected path frame paths with the current Paint Synthesizer settings.

Expand Path Layer

This menu command expands the current path frame paths. A path is expanded by drawing a new path around its edges in a circle. Parameter settings to adjust this process are located on the Bezier Edit Operation pane.

Canvas Edges to Path

This menu command examines the current Canvas image and generated a series of new paths that represent the edges of the current

Canvas image.

Source Edges to Path

This menu command examines the current Source Image and generated a series of new paths that represent the edges of the current Source Image.

Delete Path Layer

This menu command deletes all of the paths in the current path frame.

Import Path Layer...

This menu command allows you to choose a new set of paths stored on your hard disk in a path layer file.

Export Path Layer...

This menu command allows you to export the current path frame to a path layer file on your hard disk.

PathLayerRecord

This menu command allows you to access different settings associated with recording and playing back paths. The different editable settings are accessed via the sub menus.

Action

The following menu commands are accessible from the Action main menu:

Do Current Action
Paint Action Window...

Paint Action Commands
Import Paint Action Sequence...
Export Paint Action Sequence...
History Window...
History Commands
Import History Sequence...
Export History Sequence...

Each of these Action menu commands will be explained in more detail in the following sections.

Do Current Action

This command executes the current Operation Action.

Paint Action Window...

This command opens the Paint Action Sequence Window.

Paint Action Commands

This menu command allows you to access different commands associated with the current Paint Action Sequence. The different commands are accessible via the sub menus.

Import Paint Action Sequence...

This menu command allows you to import a new Paint Action Sequence from the hard disk.

Export Paint Action Sequence...

This menu command allows you to export the current Paint Action Sequence to your hard disk.

History Window...

This command opens the History Window.

History Commands

This menu command allows you to access different commands associated with the current History Sequence. The different commands are accessible via the sub menus.

Import History Sequence...

This menu command allows you to import a new History Sequence from the hard disk.

Export History Sequence...

This menu command allows you to export the current Paint Action Sequence to your hard disk.

Movie

The following menu commands are accessible from the Movie main menu:

Start Movie To File...
Stop Movie To File
Write Canvas as Movie Frame
Write Frame Each Action
Write Time Animation
Write Warp Animation
Write Morph Animation
Write PASeq Animation
Keyframe Timeline Window...
Timeline Commands
Load Ram Movie..

UnLoad Ram Movie
Save Ram Movie
Process Movie with PASeq...

Each of these Movie menu commands will be explained in more detail in the following sections.

Start Movie To File...

This command allows you to create a new open movie file. After you execute this command, you can save individual Canvas frames or execute and save frames from Time-based Operations like Paint Animations, Warping, Morphing, or Paint Action Sequences.

Stop Movie To File

This command closes the current open movie file.

Write Canvas as Movie Frame

This command writes the current Canvas to the current open movie file as a movie frame.

Write Frame Each Action

Toggling this command turns on and off automatic frame writing from any Operation Action. If turned on, every time you execute an Operation's Action, the result of that Action will be written to the current open movie file as a new frame.

Write Time Animation

This command executes a keyframe paint animation from the current Time Animation settings. If there is a current open movie file, each frame of the animation is written to the open movie file as a new movie frame.

Write Warp Animation

This command executes a keyframe warp animation from the current Warp Animation settings. If there is a current open movie file, each frame of the animation is written to the open movie file as a new movie frame.

Write Morph Animation

This command executes a keyframe morph animation from the current Morph Animation settings. If there is a current open movie file, each frame of the animation is written to the open movie file as a new movie frame.

Write PASeq Animation

This command executes a Paint Action Sequence animation using the current Paint Action Sequence and the current animation settings. The entire Paint Action Sequence is executed for each new animation frame. If there is a current open movie file, each frame of the animation is written to the open movie file as a new movie frame.

Keyframe Timeline Window...

This command opens the Keyframe Timeline Window.

Timeline Commands

This menu command allows you to access different commands associated with the Keyframe Timeline. The different commands are accessible via the sub menus.

Load Ram Movie..

This menu command brings up a dialog that allows you to choose a QuickTime movie file from your hard disk that will then be loaded into RAM memory in the Studio Artist Canvas. After the movie loads,

you will be able to play it back from RAM as well as paint or edit individual frames.

UnLoad Ram Movie

This menu command unloads the current RAM movie. This command does not save any changes to an edited RAM movie.

Save Ram Movie

This menu command caves any edited changes to the current loaded RAM movie.

Process Movie with PASeq...

This command processes a source QuickTime movie located on your hard disk with the current Paint Action Sequence frame by frame, generating a new processed QuickTime movie. The size or resolution of the processed output movie can be different from the original source movie. The source movie file is not changed or edited in any way.

This command is executed in three steps. First, you will be prompted with a standard file dialog to choose a source movie file. After you click OK, a dialog will come up that allows you to specify the output movie size. The size of the output movie can be different than the source movie. After you click OK, you will be prompted by a final standard file dialog to name your output movie file and specify it's location on your hard disk. When you click OK, the movie processing will begin.

You can stop the movie processing at any time by hitting the spacebar or by mousing down in the Studio Artist interface. If you click Cancel in the final standard file dialog, the processing will still take place, but will not be written to an output movie file. This is a useful way to preview your processing sequence in the Canvas prior to final execution into an output movie file on your hard disk.

Operation

The following menu commands are accessible from the Operation main menu:

Paint Synthesizer
Presets
Image Operations
Bezier Draw
Bezier Edit
Region Selection
Warp
Timeline Animation

The Operation menus provide quick one step access to the various modal Operations and their associated parameter sub panes. This menu can be used as an alternative to navigating the hierarchial parameter panes via their popup controls.

Each of these Operation menu commands will be explained in more detail in the following sections.

Paint Synthesizer

This menu provides quick navigation access to the individual parameter panes associated with the Paint Synthesizer. There is a sub menu for each of the individual Paint Synthesizer control panes.

Presets

This menu provides quick navigation access to the individual parameter panes associated with Studio Artist's Presets. There is a sub menu for each of the individual Preset access panes.

Image Operations

This menu provides quick navigation access to the individual parameter panes associated with Studio Artist's Image Operations. There is a sub menu for each of the individual Image Operation control panes.

Bezier Draw

This menu provides quick navigation access to the Bezier Draw control pane.

Bezier Edit

This menu provides quick navigation access to the Bezier Edit control pane.

Region Selection

This menu provides quick navigation access to the individual selection modes associated with Region Selection. There is a sub menu for each of the individual Region Selection methods.

Warp

This menu provides quick navigation access to the individual selection modes associated with Interactive Warping. There is a sub menu for each of the individual Interactive Warp methods.

Timeline Animation

This menu provides quick navigation access to the individual parameter panes associated with Timeline Animation. There is a sub menu for each of the individual Timeline Animation methods and control panes.

Chapter 7: Technical Questions

Studio Artist is a powerful creative tool with an extreme amount of user configurability. With all of this creative power comes at the cost of a certain amount of complexity under the hood. In addition, the extensive and open ended editing capabilities give a user the chance to paint themselves in a corner by specifying logically inconsistent paint patches.

This chapter provides some answers to common technical questions. Before you email of call Technical Support, you should check this chapter to see if the answer to your question is here.

Troubleshooting Your Problem

Is the problem a bug or is there something you don't understand?

Is the problem repeatable.

Trace your signal flow.

Common Problems

The Application Doesn't Launch

You are probably running a version of the QuickTime system extension that is earlier than version 3.0. If so, you need to upgrade to version 3.0 or higher. Use the QuickTime installer included on the CD-Rom to upgrade your version of QuickTime.

The program doesn't seem to be drawing.

You may have specified a paint patch that is logically inconsistent. There are a number of possible ways to do this. Here are some scenarios to watch out for.

Check to make sure you don't have a region mask specified as a part of the paint patch. If you do, it will only draw or image process within the mask region (ie. the white part).

Check the **Paint Fill** parameter pane. Make sure you don't have the **Paint Fill** settings **Fill From** and **Fill To** both set to **Canvas Image**. If you do, this will just repaint the Canvas Image back onto itself.

Check to make sure the maximum brush size (located in the **Brush Modulation parameter pane**) isn't set to 0 or very low. If the brush size is pressure modulated and you are using a mouse, make sure the **Autodraw Pressure Range** (located in the **Miscellaneous** parameter pane) isn't set to 0.

Check the Paint Fill parameters. For example, if you have a black background and you are using a **Composite** setting of **Min**, then nothing will draw because the black background is as minimum as it can get. Same thing for a white background and a **Composite** setting of **Max**.

Check your Path Start and Path End parameters carefully. You may have set them up in a way that is prohibiting you from drawing.

Why don't I have any Presets?
Why does the application take forever to boot?

The application needs to live on your hard disk next to the '**Preset**', '**PASeq**'. '**Workspace**', and '**Brush**' folders. It doesn't know how to find the presets unless these folders are in the same folder as the application. It will spend a long time searching for them on your entire hard disk if they aren't there.

What happened to my Bezier frames, current Layers, etc.

Opening a RAM movie will erase all of your current layers, Bezier frames, etc. The program asks you if you want to save before it does this.

Other tips

Morph animations print to the current Layer. If you set the current Layer to either Layers 2 or 3 (ie. the source and destination images for the morph), they will be recursively altered during the morph process. This may look cool, but will not be what you expected if you just want a normal morph.

Why are some popup interface elements missing

You are running a very early version of the Appearance manager extension, and need to update it to version 8.1 or later.

Why am I running out of memory after running the program for a long time

History recording may be turned on. The history file does not spool to disk with this version. This means that your Paint Action history will grow over time as you do things with the program, taking up more and more memory. If you are working close to the memory edge, you will eventually run out.

You might want to turn off history recording if you run Studio Artist in a low memory partition or are working with big files. You can do this by going to '**Preferences...**' located under the '**File**' menu, and turning off default history recording.