



STUDIO ARTIST 5.5



User's Guide

This User's Guide is the official reference for Studio Artist 5.5.

Studio Artist User's Guide by John Dalton.

Studio Artist application by John Dalton.

Special thanks beyond the call of duty to Candice Pacheco.

Thanks to Michael Van Der Linden, Bernard Brunner, Jean Detheux, Chuck Floading, Victor Ingrassia, Dennis Miller, Sharon Katz, Craig Deeley, David Kaplan, Dave Mazza, Dave Nagel, Tien Yang, Jason Sharp, John Binkov, Toru Kawate, Margie Levinson, Scott Rawlings, Steve Campbell, Julia Kay, Tom Dimuzio, Nina Paley, Jenna Amberg Johnson, and everyone else who contributed their time and talent over the years.

Studio Artist™ is developed and supported by Synthetik Software.

Synthetik Software Inc.

The Landmark Tower

1888 Kalakaua Ave, Suite C312

Honolulu ,HI 96815

Voice: 877-213-2555

Visit us online at: www.synthetik.com

Technical Support online: www.synthetik.com

(Please include your serial number in any communications when you contact Technical Support.)

Information in this document is subject to change without notice and does not represent a commitment on the part of Synthetik Software, Inc. The software described in this document is furnished under a license agreement or nondisclosure agreement. The software may be used or copied only in accordance of the terms of the agreement. It is against the law to copy this software on any medium except as specifically allowed in the agreement. No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, for any purpose without the express written permission of Synthetik Software, Inc.

Copyright © 1999-2021 Synthetik Software, Inc. All rights reserved.

Studio Artist is a registered trademark, and Synthetik, Graphics Synthesizer, Intelligent-Assisted Drawing, and the Synthetik Software logo are trademarks of Synthetik Software, Inc. Macintosh and Mac OS are trademarks of Apple Computer, Inc. Other products mentioned are trademarks of their respective holders.

Table of Contents

Chapter 1: Getting Started.....	1
Studio Artist is a smart painting, drawing, image and video processing program which includes:	1
The World's First Graphics Synthesizer.....	2
Intelligent-Assisted drawing.....	2
The complexity of Raster paint with the editability of Vector paths.....	3
Extensive Interactivity.....	3
Auto Rotoscoping	3
Vector-based warping and morphing	3
Image Processing.....	4
Texture Synthesis.....	4
Vectorizer - Raster to Vector Conversion.....	4
MSG - Modular Synthesized Graphics	5
Live Video Processing	5
Overview	6
Working With Movies.....	14
Studio Artist Windows and Palettes.....	15
Source Area	16
Editor	22
Working Canvas	22
Operation Toolbar	23
Favorites Preset Toolbar	24
Help Palette.....	25
Installing Studio Artist on your Hard Disk	26
Quick Start.....	28
System Requirements	31
Chapter 2: Operation Modes.....	34
Presets	37
Paint Synthesizer.....	43
Image Operations.....	46
Temporal Image Operations	48
Texture Synthesizer.....	49
Vectorizer.....	51
MSG - Modular Synthesized Graphics	52
Warp.....	53
Warp Quality Settings	54
Hot Keys.....	54
Adjust.....	55
Hot Keys.....	55

Selection.....	57
Region Masking.....	59
Bezier.....	61
Bezier Drawing.....	61
Bezier Editing	63
Chapter 3: Paint Synthesizer Classic.....	64
Introduction	65
Overview of the Paint Synthesizer	65
Paint Synthesizer Interactive Pen Modes	70
Paint Synthesizer Editable Control Panes	75
Paint Synthesizer Control Pane Organization	76
Pen Mode.....	80
Autodraw Mode Parameters	80
Region Draw Mode Parameters.....	81
ParticlePaint Mode.....	84
ParticlePaint Mode Parameters.....	84
MultiPen Mode.....	89
Region as Brush Mode.....	93
Path Start	98
Start Generator Options	103
Path Shape.....	110
Path Shape Type Options	117
Path Angle.....	121
Path End	124
Path Application	129
Path Randomize	132
Paint Color Source	135
Paint Color Modulate	143
Fixed Colors.....	146
Paint Source Offset.....	148
Paint Brush Load.....	152
Brush Load Lighting Effects	154
Brush Load Procedural Texture Generator.....	156
Brush Load Image Processing	157
Brush Load Gradient Generator	160
Brush Load MSG	161
Paint Fill Setup	163
Paint Fill Apply	168
Alpha Fill.....	171
Brush Source	173
Computational Brushes.....	174
Image Brushes	178

Text Brushes	180
Movie Brushes	182
Generative Brushes	185
MultiNib Brushes	187
MSG Live Brushes	188
Brush Type	189
Specific Brush Generation Parameters	193
Brush Modulation	205
Background Texture	209
Generic Background Texture Parameters	210
Procedural Textures	212
Image Textures / Color Image Textures	213
Movie Textures	214
Movie Pixel Index Textures	217
Texture Synthesizer Textures	218
Live Video Textures	218
Chapter 4: Image Operations	220
Generic Image Operation Parameters	221
Texture Synthesizer Modulation in Image Operations	224
Image Operation Terminology	225
Image Operation Examples	229
Adaptive Filter	230
Adaptive Filter Convex Hull	231
Block Abstraction	233
Blur 23	
Cellular Abstraction	236
ColorEdge	238
Color Gradient Generate	239
Color Gradient Map	240
Color PaletteMap	242
Color Simplify	243
Color Simplify1	245
Color Quantize	246
Colorize	247
ConvexHull	248
DeInterlace	249
Displacement	251
Edge	252
Equalizer	254
Fixed Color	255
Fixed Image	257
Flat Region Colorize	259

Fracture.....	261
Fracture Displacement.....	263
Geodesic Displacement.....	265
Geodesic Falloff.....	266
Geodesic Filter.....	268
Geodesic FX.....	269
Geodesic Growth.....	270
Geodesic Interpolation.....	271
Geodesic Recursive Growth.....	272
Geodesic Rings.....	274
Geodesic Variator.....	275
Geodesic Warper.....	276
Gradient.....	278
Gradient Lighting.....	280
Hue Shift.....	282
Image Compressor.....	283
Invert.....	284
Line Screen.....	286
Line Screen Dual.....	287
Line Screen Dual1.....	289
Line Screen Block Regionize.....	291
Line Screen Regionize.....	293
Morphol.....	294
Morpholizer.....	295
Oil Painter.....	297
Random Block Exchange.....	298
Rank Area Filter.....	299
Rank Edge Filter.....	300
Rank Falloff Filter.....	301
Rank Line Filter.....	302
Rank Multiscale Filter.....	303
Resynthesis.....	306
Selective Color Map.....	307
Selective Color Matte.....	308

Chapter 5: Texture Synthesizer..... 310

Introduction.....	311
Overview of the Texture Synthesizer.....	311
Texture Synthesizer Editable Control Panes.....	313
Using Color Palettes and Gradients.....	315
Spatial Parameters.....	316
Generator Parameters.....	318
Mapping Parameters.....	321

Effect Parameters.....	323
Chapter 6: Vectorizer	326
Introduction	328
Overview of the Vectorizer	328
Vectorizer Editable Control Panes	330
Drawing.....	342
Composite	347
Chapter 7: MSG	350
Introduction	351
Overview of MSG Processing.....	351
MSG Editor Panel.....	354
MSG Advanced Editor	356
MSG Preview	356
Processor Chain and Bus Steam Lists	357
Processor Chain and Bus Steam Lists	357
Using MSG in the Paint Synthesizer	360
MSG Evolution Editor.....	361
Chapter 8: Region Selection.....	366
Selecting a Region Interactively	367
Region Selection Pen Modes.....	369
Selection Region Canvas Movement.....	374
Region Selection Hot keys	375
Region Selection Menu Commands	377
Chapter 9: Bezier Paths	378
Bezier Draw.....	379
Editable Bezier Draw Parameters	382
Bezier Edit.....	383
Adjustable Bezier Edit Parameters	384
Curve Editing Hints:.....	384
Bezier Edit Hot Keys:.....	387
Path Frame Menu Commands	388
Storing Bezier Paths Within a Single Paint Synthesizer Action Step.....	390
Generating and Filling Bezier Paths from the Vectorizer.....	392
Generating EPS Output from Bezier Paths	393
Chapter 10: Actions.....	394
Working With Paint Action Sequences	395
Sequence Controls.....	395
Individual Action Step Controls	395
Paint Action Menu Commands.....	398
Unique Features of Paint Action Sequences.....	398

Keyframe Animation in Paint Action Sequences	399
Animation Sequence Controls.....	400
Working with the PASEq Keyframe Cells.....	402
Bezier Edit and PASEq Keyframe Cells.....	405
Chapter 11: Layers	406
Working With Layers.....	408
Layer Controls in the Operation Toolbar.....	408
Layer Palette	409
Layer Menu Commands	411
Supersizer Interpolation.....	412
Chapter 12: Movies	414
Automatically Processing an Existing Movie File.....	416
Batch Processing a Movie File with a Paint Action Sequence	417
Using Paint Action Sequences for Movie Processing	420
Generating a New Movie File With a New Movie Stream	423
Generating a New Canvas Movie Layer	425
Working with Movie Layers in the Canvas.....	427
Manipulating a Movie Layer Frame.....	427
Generating a Moving Bezier Mask.....	429
Working with Alpha Channels in Movies.....	430
Working with the Source Movie Embedded Alpha	430
Generating Embedded Alpha in a Processed Output Movie	431
Working with Final Cut Pro and iMovie	432
Working With Time Particles for Motion Effects.....	433
Working With Movie Brushes in the Paint Synthesizer	434
Using Movie Brushes to Generate Compositing Effects	434
Using Movie Brushes to Generate Photo Montage Images	435
Converting a Folder of Images into a Movie File	435
Making a Movie Brush from your Image Folder Movie File.....	436
Recording Your Painting Directly to Video	438
Chapter 13: Helpful Hints	440
Introduction	440
Left Brain vs Right Brain Work Strategies	441
Designing a Paint Strategy.....	443
Designing a Custom Art Process	444
Using Evolution to Generate New Paint Patches.....	446
Using Layers to Visualize Paint Edits or Mix Paints.....	447
Simulating Multi-Color Brushing Effects	448
Alternative Uses for the Source Image.....	449
How to Visually Abstract the Source Image	451
Knowing When to Stop Painting	452

Using a Movie to Generate a Series of Still Paintings.....	454
Using QuickTime Movies to Build Dynamic Brush Masks	455
Support for the Advanced Features of Wacom Graphics Tablets	457
Chapter 14: Quick Tips.....	458
Introduction	458
Changing the Brush Size	459
Erasing the Canvas	460
Changing the Eraser Preset	460
Processing a Movie File	461
Selecting a Region	461
Moving or Scrolling the Canvas With a Hand Tool	463
Masking Painting With the Current Region Selection	463
Adjusting the Paint Brush Transparency	463
Navigating the Studio Artist Interface	464
Generating Bezier Paths from the Vectorizer Output to Paint Using the Paint Synthesizer	464
Changing the Number of Frames in the Timeline	464
Getting Rid of Flicker in Paint Animations	465
Speeding up Paint Stroke Drawing	466
Saving a Preset You Like in a Favorites Memory	467
Adding or Changing a Preset Help Message	467
Paint Strokes that Auto Regionize	468
Quick and Easy Paint Synthesizer Macro Edits	468
Generating Flat Cartoon Style Effects	468
Chapter 15: Menu Commands	470
Main Menus	471
File	471
Edit	471
Canvas	471
Path	471
Action.....	472
Operation.....	472
Windows.....	472
Help.....	472
File 37	
New Source and Canvas.....	473
Recent Source and New Canvas	474
Open Source.....	474
Recent Source.....	474
Source Options	474
:Movie Loop Action Advance.....	474
:Movie Loop Play	475
:Synch Timeline Frame Count	475

:Live Video Capture Now	475
:Live Video Preview Manual Capture	475
:Live Video Loop Action Advance	475
Save Canvas As	475
Open Session	476
Save Session As	476
Stream	476
:New Movie Stream	477
:New Image Stream	477
:Close Open Stream	477
:Write Frame	478
:Flags :Enable Always AutoWrite	478
:Flags :Enable Gated AutoWrite	478
:Flags :Enable Write on Op End	478
:Flags :Enable Write on PAsEq Cycle	478
:Flags :Enable on Gallery Show Cycle	478
:Flags :Use Alpha Gen Movie Pref	479
Movie Codec Settings	479
Import	479
:Import Paint Preset	479
:Import Image Operation Preset	479
:Import Temporal Image Operation Preset	480
:Import Texture Synthesizer Preset	480
:Import Vectorizer Preset	480
:Import MSG Preset	480
:Import DualMode Preset	480
:Import Paint Action Sequence Preset	481
:Import History Sequence	481
:Import Color Palette	481
:Import Color Gradient	481
:Import Bezier Path Frame	481
:Open New Canvas	481
:Open Movie as New Canvas Movie	482
Export	482
:Export Paint Preset	482
:Export Image Operation Preset	482
:Export Temporal Image Operation Preset	483
:Export Texture Synthesizer Preset	483
:Export Vectorizer Preset	484
:Export MSG Preset	484
:Export DualMode Preset	484
:Export Paint Action Sequence Preset	484
:Export History Sequence	484

:Export Color Palette.....	485
:Export Color Gradient.....	485
:Export Bezier Path Frame.....	485
:Update Old Preset Factory Library	485
:Update Old Preset Folder.....	485
Paint Synthesizer.....	486
:New Image Brush	486
:New Movie Brush	486
:New Background Image Texture	486
:New Background Movie Texture	487
Page Setup.....	487
Print.....	487
Preferences	487
Quit.....	487
Edit 98	
Undo	489
Redo	490
Cut.....	490
Copy	490
Paste	490
Clear	490
Source.....	490
:Source Color.....	490
Palette.....	490
:Generate from :Source Image	491
:Generate from :Canvas Image.....	491
:Generate from :Selected Canvas Image	491
:Generate from :Source Gradient	491
:Randomize Source Color :Lum Saturation.....	491
:Randomize Source Color :Opponent	491
:Randomize Source Color :TriOpponent.....	491
:Randomize Source Color :Analogous	493
:Randomize Source Color :MidLuminance	493
:Randomize Source Color :SplitOpponent	493
:Sort by :Color Distance.....	493
:Sort by :Luminance	493
:Sort by :Hue	493
:Sort by :Saturation.....	493
Gradient.....	494
:Generate from :Source Image	494
:Generate from :Canvas Image.....	494
:Generate from :Source Palette	494
:Generate from :Source Color Opponent	494

:Generate from :Source Color TriOpponent	494
:Generate from :Source Color Analogous	494
:Generate from :Color Mem 1-2	494
:Randomize :Index	495
:Sort by :Color Distance.....	495
:Sort by :Luminance	495
:Sort by :Hue	495
:Sort by :Saturation.....	495
: Sort by :Flip Index.....	495
Preset.....	495
:Update Current Preset Icon	496
:Make New Favorites Category	496
:Current Preset Command tag to Clipboard	496
:Retarget StudioArtist Folder	496
Paint Synthesizer.....	496
:Pen Eraser.....	497
:Patch Memory 1.....	497
:Patch Memory 2.....	497
:Patch Memory 3.....	497
:Patch Memory 4.....	497
:Fixed Color 1.....	498
:Fixed Color 2.....	498
---.....	498
:Path Memory 1	498
:Path Memory 2	498
:Brush Memory 1.....	498
:Brush Memory 2.....	498
Canvas	499
Zoom	499
:Zoom Out.....	499
:Zoom In	499
:Zoom Full Out.....	500
:Zoom Full In	500
:Zoom to Fit.....	500
:Zoom to Specify.....	500
Resize Canvas.....	500
Layer	500
:New Layer.....	501
:Current View as New Layer	501
:Flatten All Layers	501
:Capture View to Current Layer.....	501
:View All	501
:Paint Mask Type: Paint.....	501

:Paint Mask Type: Path.....	501
:Paint Mask Type: Litho.....	501
:Mask Status.....	502
Movie Layer.....	502
:Convert to Movie Layer... ..	502
:New Movie Layer.....	502
:Open Movie as New Layer... ..	502
:Save Flattened Canvas Movie as.....	503
:Convert to Image Layer	503
:Record to Existing Frame.....	503
:Insert as New Frame.....	503
:Insert as N New Frames.....	503
:Delete Existing Frame.....	503
:Settings :Loop Play	503
:Settings :Advance on Record.....	504
Alpha.....	504
:Enable for View	504
:Set to :Full Off	505
:Set to :Full On	505
:Set to :Selection.....	505
:Set to :Source Alpha.....	505
:Initialize :Full On.....	505
:Initialize :Full Off	505
:Background :Black	505
:Background :White	505
:Background :Gray	505
:Paint Synth Alpha Enable	505
Blanking.....	506
:Initialize	506
:Set to Canvas.....	506
:Set to Source Edges	506
Selection.....	506
:Set to :Full Off	506
:Set to :Full On	506
:Set to :Canvas.....	507
:Set to :Canvas Alpha.....	507
:Set to :Source.....	507
:Set to :Source Alpha	507
:Set to :Regionized Source.....	507
:Set to :Blanking.....	507
:Set to :Bezier Frame	507
:Set to :Selected Bezier	507
:Invert	508

:Feather	508
:Expand	508
:Contract	508
:Cleanup	508
Default Color	508
:White	508
:Black	509
:Source Color	509
:Source Image	509
:Selection	509
:Live Video Capture	509
:Source Alpha	509
:Layer Alpha	509
:Source Color Mem 1	509
Set to Default Color	510
Default Interpolation	510
:BiCubic	510
:Supersizer	510
Erase	510
Canvas to	510
:Source	510
:Clipboard	510
Onion Skin	511
:Toggle OnionSkin	511
:Manual Load	511
:Source	511
:Canvas Movie	511
:Last Stream	511
:Sequential Key Frame	511
Path	513
Paint Paths	513
:Full Layer	513
:Reverse Full Layer	513
:Selected Only	513
Generate Paths	514
:from Source Edges	514
:from Source Adjacent Edges	514
:from Canvas Edges	514
:from Selection Edges	514
:from Source Skeleton	514
:from Canvas Skeleton	514
:from Selection Skeleton	514
:from NonWhite Canvas	515

:from NonWhite Selection.....	515
:Gen Option.....	515
:from Ip Op.....	515
Path Layer Commands.....	516
:Erase.....	516
:Expand.....	516
:Expand and Remove.....	516
:Complete Expand.....	516
---.....	516
:Connect Closest.....	516
:Connect Closest and Remove.....	516
:Connect if Close.....	516
---.....	517
:Skeletonize.....	517
:Skeletonize and Remove.....	517
---.....	517
:Simplify.....	517
:Simplify Lite.....	517
:Straighten.....	517
:Straighten Subtle.....	517
:Size Prune.....	517
:Size Prune1.....	518
:Size Prune2.....	518
Convert to Paint Synthesizer.....	518
:as Time Particles.....	518
:as Autodraw Embedded Bezier Frame.....	518
:as Repeating Pattern.....	518
:Convert PASEq Bezier Context to Embedded Autodraw.....	518
:Convert PASEq Source Context to Bezier Context.....	519
:Convert MSG Scan to Embedded Bez Path Start.....	519
Path Layer Record Options.....	519
:Pen Draw.....	519
:Action Draw.....	519
:Vectorizer.....	520
:Erase Before Action.....	520
:Use Recorded Paint Color.....	520
:Split NonContiguous.....	520
Path Memories.....	520
:Internal : Playback.....	520
:Internal : Record.....	520
:Global1 : Playback.....	521
:Global1 : Record.....	521
:Global2 : Playback.....	521

:Global2 : Record	521
:Global3 : Playback.....	521
:Global4 : Record	521
:Global5 : Playback.....	521
:Global5 : Record	521
Action.....	522
Do Current Action.....	522
Run Loop Action	522
History Sequence	522
:Play	523
:Erase	523
:Record	523
:Copy Replace to PASEq	523
:Copy Replace to PASEq	523
Paint Action Sequence.....	523
:Play	523
:Loop Play Paint Action Sequence	523
:Activate Paint Action Sequence Recording.....	524
:Record Last Action as Paint Action Step.....	524
:Erase	524
PASEq Timeline.....	524
This menu allows you to access the following commands associated with the current Paint Action Sequence timeline.	524
:Time Compress/Expand.....	524
:Delete Keyframes	524
:Embedded Bezier Frame :Reorder Minimal Distance	525
:Embedded Bezier Frame :Normalize Recycle.....	525
:Embedded Bezier Frame :Normalize Split.....	525
:Record Context :Source	525
:Record Context :Bezier	525
:Record Context :Content	525
:Record Context :Bezier+Content	526
:Record Context :Morph.....	526
:Record Context :Warp	526
:Record Context :Filter.....	526
:Record Context :Inv Warp.....	526
:Record Context :Multiple Keys :Source.....	527
:Record Context :Multiple Keys :Content.....	527
:Record Context :Multiple Keys :Morph.....	527
Process Movie With Paint Action Sequence.....	527
:Movie to Movie...	527
:Movie to Image.....	529
:Movie to EPS.....	529

:Image to Movie.....	530
:Image to Image.....	530
:Image to EPS.....	530
Batch Process.....	530
:with Paint Action Sequence.....	531
:with Folder of Paint Action Sequences.....	531
Generate EPS.....	531
:with Vectorizer.....	531
:with Paint Action Sequence.....	531
Generate SVG	532
:with Vectorizer.....	532
:with Paint Action Sequence.....	532
:Print with Paint Action Sequence.....	532
Run Gallery Show	533
Operation.....	534
Flip.....	534
Presets	535
Image Operation	535
Temporal Image Operation.....	535
Texture Synthesizer.....	535
Vectorizer.....	535
MSG.....	535
Paint Synthesizer Classic	536
DualMode Paint	536
Warp.....	536
Adjust.....	536
Selection.....	536
Bezier.....	536
Paint Action Sequence.....	537
Windows.....	538

Chapter 16: Technical Questions..... 540

Troubleshooting Your Problem	540
Things to Keep in Mind.....	542
Large Source Images.....	542
Image Open and Save Operations	544
Movie Frame Writing to a Disk File	544
Common Problems	545
The application launches but never starts up properly.....	545
The application takes forever to launch and there are no presets.	545
I keep getting assert error messages when running the program.	546
I installed a new Wacom tablet driver and now the application doesn't launch.	546
The program doesn't seem to be drawing.	547

I reset the background but nothing changed?	548
I reset the background to white but i still see a black canvas?	548
Why don't I have any Presets?	550
Why does the application take forever to boot?	550
Why can't I open an image file?	550
Why am I running out of memory after running the program for a long time?	551
I'm processing a movie file with a Paint Action Sequence and the output movie file is all white?.....	551
How do I get the individual movie frames to appear in the Canvas when processing a movie file?	551

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, ground breaking, 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 thought 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 artistic manipulations 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 Software is also unique among many companies in that we are dedicated to creating software that is affordable by individuals. Studio 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.

What does this mean for you as a user of the program? Studio 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 its 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.

Feel free to contact us via email at techsupport@synthetik.com.

We look forward to hearing from you!

Welcome to Synthetik Studio Artist 5.0!

We're all very excited about this major new release of our award winning Studio Artist Graphics Synthesizer. There are a ton of new features incorporated into this new release, along with a lot of refinement and enhancement of the existing functionality. This release incorporates a major rewrite of all the underlying code used in Studio Artist.

We are providing two different versions of the Studio Artist 5.0 application. One is optimized for Apple's Mac OS-X. The other is optimized for Windows PC's. This way you can choose the operating system platform you want to work with and not be compromised in any way.

We've also tried very seriously to incorporate the many great suggestions we've received from our dedicated users since the initial Studio Artist release and incorporate them into this new version. This process is an ongoing one and you can be a part of it. Please let us know your feature suggestions and feedback so we can make Studio Artist an even greater program.

Synthetik is trying to be much more aggressive about publishing web-based documentation for Studio Artist. The Studio Artist Tips site at www.synthetik.com/tips is one example. The Studio Artist User Forum at studioartist.ning.com is another example. Also, the Studio Artist news blog at studioartist.blogspot.com has additional tutorial posts from time to time.

The nice thing about web based documentation is that we can update it quickly over time to answer specific questions or to document new features or techniques. This traditional pdf user guide gets updated on a much more irregular time schedule. So you should use these web resources in addition to this user guide as resources to help answer your Studio Artist questions.

Synthetik Software is still devoted to pushing the envelope of creative and artistic expression. We have some exciting new products under development.

Feel free to contact us via email at techsupport@synthetik.com with your suggestions and feedback.

Again, please check out the Studio Artist User Forum at studioartist.ning.com and become a part of the online Studio Artist community. You can ask questions that will be answered by Studio Artist experts as well as share your opinions, art and presets with other Studio Artist users. So if you have questions about how to use Studio Artist that can't be answered by this use guide the User Forum is where you should go first to receive help.

Chapter 1: Getting Started

Studio Artist is a smart painting, drawing, image 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 and Video Effects Suite

Auto Rotoscoping and Video Effects Processing

Real-time Image Warping and Keyframable Morphing

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

Resolution Independent Texture Synthesis and Texture-based Effects

3D Paint Lighting and Texture Effects

MSG - Modular Synthesized Graphics Plug-in Architecture

Vectorizer - Artistic Raster Image to Vector Region Convertor

Live Video Processing

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 Studio 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 Studio Artist do all the work. Whatever the user's skill, Studio Artist can Intelligently-Assist in achieving a much greater level of creative 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



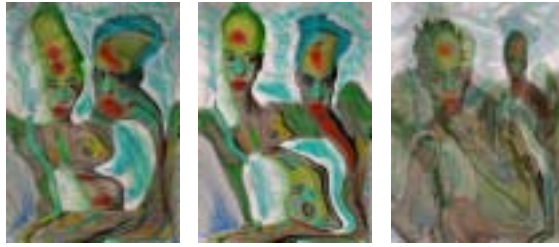
Studio Artist takes full advantage of all of the advanced features of the awesome Wacom Intuos Graphics Tablets. Go wild! The user can interactively modulate hundreds of paint parameters in real time using Wacom's pressure sensitive pens, air brush tools, 4D mouse, tilt and pressure modulation. Watch 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 Studio Artist automatically generate a hand-painted and/or processed video sequence.

Vector-based warping and morphing



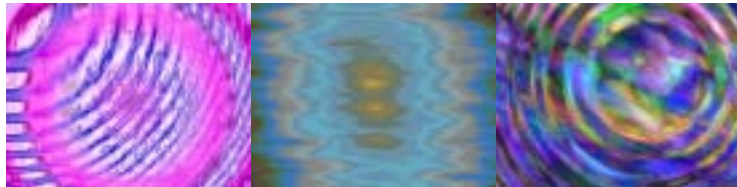
Design vector-based unlimited keyframe image warps, morphs, or video feedback effects that can be saved as QuickTime moves. Warp, stretch, and mutilate images in real time using a pressure sensitive pen or mouse.

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. Image processing brush loading within the Paint Synthesizer allows for pen controlled image processing.

Texture Synthesis



The Texture Synthesizer module allows for resolution independent texture synthesis or texture based image processing effects. The end result could be image processing or video effects, or complete generation of static or dynamic abstract imagery.

Vectorizer - Raster to Vector Conversion



The Vectorizer allows for a wide range of artistic raster to vector effects. Create automatic cartoon rendering of static images or cartoon animation automatically from Quicktime video. The Vectorizer also allows for resolution independent eps output so you can print your work on large format printers or output numbered eps frames for importing into Flash.

MSG - Modular Synthesized Graphics



MSG stands for modular synthesized graphics. MSG is the new modular preset-based plug in architecture from Synthetik Software. MSG allows you to build an unlimited number of image processing or video effects as well as generate amazing static or dynamic abstract imagery. Unlike other plug in architectures, MSG is preset based which means you can create your own processing effects from scratch or customize existing ones.

Live Video Processing



Studio Artist now allows you to incorporate a live video feed directly into the Paint Synthesizer for amazing interactive real time graphics.

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 effects or interactive paint tools. 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.

Terminology

First, some terminology. Most of the screen real estate is taken up by the working Canvas. The “**Canvas**” is the image you are painting, editing, manipulating, etc. The Canvas may contain multiple Layers.

Different editing palettes can be docked at the edges of the main Canvas. Or they can be floating windows, which is useful if you work with multiple monitors. By using the 4 workspace layout memories you can custom configure your workspace and change it on the fly as you work.

The “**Source**” is the source of the visual attributes used by the program for intelligent-assisted drawing and visual effects.

What is a visual attribute? Studio Artist understands visual representation of images by modeling human visual perception, and is always trying to use this perceptual 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 advanced than what has traditionally been called cloning in other programs, and the uses of the Source are consequently much more varied than these other programs.

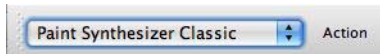
“But I hate representational painting,” you may say. “Why do I have to choose a Source.” The answer is that you don’t have to choose a

representational image. You might choose your source for it's textures, colors, or some other desired visual attribute. Or, you can ignore the Source Image and manually control all aspects of color selection and drawing as desired.

In previous version of Studio Artist you always had to open a source image at startup. In version 4 you do not have to open a source image if you want to paint manually. Be aware in this case that there is still a default solid color source image the paint synthesizer will use for visual modeling if you use any paint presets that incorporate intelligent assisted automatic drawing.

Operation Modes

Studio Artist has a number of different 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 “**Pen Modes**”. The main operation popup is located in the main Operation Toolbar of the Studio Artist interface. Next to the operation popup is the Action button, which is used to start automatic action.



Many operation modes have associated user presets. Presets are a way to store prebuilt visual effects or paint tools. Each preset has an associated set of adjustable parameters that can be edited in a standard Editor.

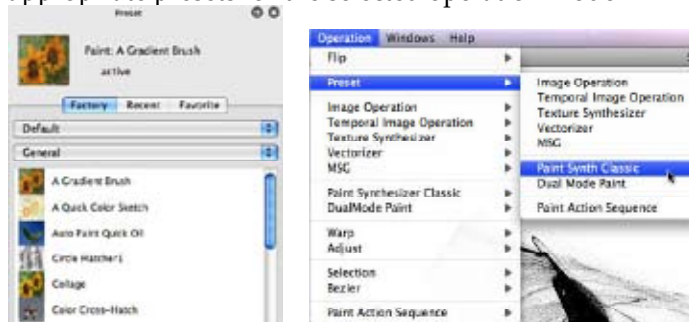
Presets and their internal set of editable parameters are also sometimes referred to as a Patch, which is some terminology originally used in music synthesis. Studio Artist takes many editing metaphors used in music synthesis and bring them to graphics and digital painting.

Studio Artist provides navigational shortcuts via the main **Operation** menu to easily access all of the various nested control panes associated with the different operation modes. For example, choosing “**Selection: Lasso**” from the **Operation** main menu would immediately switch the main Editor control pane to **Selection** and allow **Lasso** selection via the mouse in the main Canvas.

Presets

Presets provide a high level interface to the underlying power of Studio Artist. By using pre-built presets, you can get to work quickly and focus on artistic expression rather than the mechanics of designing new paint tools or effects. Presets are pre-edited sets of parameters for a particular Operation.

Presets can be accessed via the Preset palette or the Favorites toolbar or via import menu commands. You can always use the main **Operation : Preset** menus to access the different operation presets. Running these menus will bring up the Preset Browser and load it with the appropriate presets for the selected operation mode.



There are eight different types of presets associated with some (but not all) of the operation modes. They are briefly discussed below.

A “**Paint**” preset is a complete set of Paint Synthesizer parameters. Think of each Paint preset as a unique paint tool.

A “**Dual Mode**” preset is a complete set of Paint Synthesizer parameters along with a complete set of parameters for an additional specified image processing operation (IpOp, Warp, MSG, Texture Synth). Dual Mode presets can be used as dynamic paint tools that can simulate things like paint on a wet surface, or be used to generate live visual performance using paint and image processing working together to build a visual effect.

An “**Image Operations**” preset is a specific Image Processing Operation and its associated editable parameters. Each Image

Operation preset is a unique visual effect ready to use at the touch of a button.

A “**Temporal Image Operations**” preset is a specific Temporal Image Processing Operation and its associated editable parameters. Each Temporal Image Operation preset is a unique video processing visual effect.

A “**Texture Synthesizer**” preset is a complete set of Texture Synthesizer parameters. Texture Synthesizer presets can either generate a unique abstract artistic image or a resolution independent visual effect.

A “**Vectorizer**” preset is a complete set of Vectorizer parameters. The Vectorizer takes a raster image and converts it into an infinite number of artistic vector representations, which can also be output as vector eps or svg files.

A “**MSG**” preset is a complete set of parameters and processor configuration for a MSG effect. MSG stands for Modular Synthesized Graphics, and is Synthetik's new preset based totally configurable and infinitely extendable plug in architecture. MSG presets can either generate abstract visual imagery or an unlimited number of different visual effects. MSG presets can also be loaded into Paint Synthesizer paint tools, providing user configurable extensibility of the Paint Synthesizer.

A “**Paint Action Sequence**” preset is a series of recorded Actions that can include things like auto-painting, image processing operations, interactive warps, region selections, texture synthesis, etc. Paint Action Sequence presets can either be a literal record of what you have previously done in Studio Artist during an art session, or they can be stylistic scripts that are intelligently adaptable to varying source image or movie files.

Here's some more detailed overview information on the various operation modes. Each of the operation modes has one or more editable control panels accessed via a generic Editor palette. You can also access any specific control panel for an operation mode via the main Operation menu.

Paint Synthesizer Classic

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 as well as the interactivity and expressiveness of the paint tool.

All interactive paint strokes 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. This is a way to take a low resolution session history and rerender it to generate a high resolution final work suitable for printing.

Dual Mode Paint

An extension of the paint synthesizer operation mode that allows for a second dynamic image processing effect to be run while you are manually or automatically painting. This could be used to simulate things like painting on a wet surface, for visual performance, or to create totally new kinds of visual effects.

Image Operations

Allows a user to perform a large number of different image processing operations. 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. Image Operations can also be used to process the current region selection or alpha buffer for stylistic masking effects.

Temporal Image Operations

Allows a user to perform a number of different time-based image processing operations. Each temporal image processing operation also includes extensive compositing options which can be used to dramatically change the operation's resulting visual effect.

Texture Synthesizer

Allows for generation and editing of resolution independent texture based effects. Can either be used as a texture field generator or as a texture-based effects module. You can create wild abstract visual imagery that could be finished works of art as well as amazing visual processing effects. You can also create abstract textural imagery that evolves over time and output the results as a movie file.

Vectorizer

Allows the Vectorizer source image to be converted into a vector representation based on vector regions. Can also be used to generate vector region special effects. Can be used for direct vector conversion and eps output of the Vectorizer source image or as a action step in a more complicated paint action sequence.

MSG

Allows MSG modular synthesized graphics presets to be used within Studio Artist for image and video processing special effects as well as to generate amazing abstract imagery. MSG presets can also be loaded into Paint Synthesizer brushes, providing infinite user scriptable extensionality for the Paint Synthesizer. An infinite range of different modular image processing effects can be built using MSG processing modules.

Interactive Warp

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

Interactive Adjust

Allows the user to dynamically control interactive image processing or gradient fill operations.

Selection

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

Bezier

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 Paint Action Sequence Keyframe Timeline.

Paint Action Sequence

Allows the user to record and playback a series of individual action steps. Anything you do in the Studio Artist interface associated with the other operation modes (either manual or automatic actions) can be recorded as individual action steps in a Paint Action Sequence (PASEq).

PASEqs are how you combine or encapsulate different operation mode effects into a single recallable preset. PASEqs are also the mechanism used to build processing scripts for processing movie files in Studio Artist.

PASEq contexts allow for the creation of warp or morph effects. They can also be used to associated specific source images or sets of bezier paths with keyframes in the PASEq timeline. Recordable keyframes provide a way to interpolate PASEq action steps and their associated recorded internal parameters over time when processing a movie or when generating an animation.

Previous versions of Studio Artist had a Layer keyframe Timeline and a PAsEq keyframe Timeline. All of the old Layer Timeline keyframe functionality can now be accessed in the single PAsEq Keyframe Timeline using PAsEq Context action steps. The one exception is the old position keyframe type, which is not currently not supported since the initial release of v4 does not support variable sizing and positioning for different layers (this may change with a future update).

Working With Movies

All modal Operations can be performed on a static Canvas (which could contain multiple Layers), or on the individual frames of a QuickTime movie. There are several different approaches to working with movies in Studio Artist. You can automatically process existing movie files, generate new ones from scratch, or hand paint and modify movies frame by frame for traditional rotoscoping or special effects.

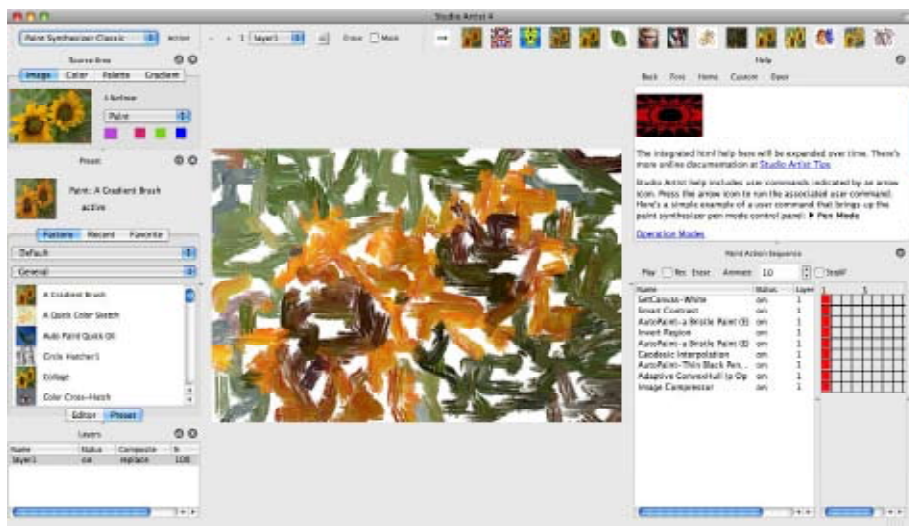
Movies can also be loaded into individual Movie Layers, which gives you the ability to hand paint or touch up individual frames as well as build up traditional hand drawn paint animation a frame at a time.

Studio Artist's ability to visually analyze and then paint or draw individual frames within a movie opens up amazing creative possibilities. You can work with one movie frame to build up a Paint Action Sequence that generates a particular artistic style or effect. Studio Artist can then automatically rotoscope the remaining frames in the movie. Studio Artist's intelligent-assisted drawing insures that each frame will be drawn properly.

The ability of Studio Artist to combine together different paint tools along with image processing effects, resolution independent texture synthesis, artistic raster to vector transformation, morphing and warping allows for a virtually unlimited and extremely powerful video effects generation environment.

Processed Quicktime movies can then be imported into any nonlinear editing or compositing program for final editing into a completed video project. Or, you can use the Vectorizer to output vectorized eps movie frames for importing into Flash or for rendering as high resolution film frames.

Studio Artist Windows and Palettes



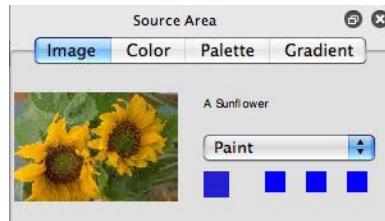
Studio Artist is primarily designed around one main drawing window that contains the canvas. The canvas is where you paint and draw or run image or video processing effects. Toolbars like the Operation Toolbar can be docked at the sides of the main window.

Auxiliary functions primarily associated with lists of actions or layers that interact with the main controls are accessed from different editing palettes. Palettes may be docked at the edges of the main canvas or can be floating windows. Palettes that are docked on top of existing palettes will be tabbed in that area.

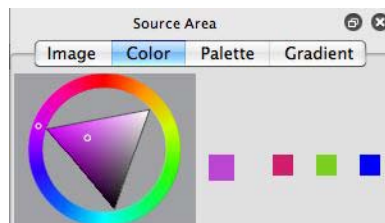
A Status area located at the bottom of the main window provides contextual information on controls the cursor is hovering over on the left, and status information on running actions on the right.

You can use the various Window menus to open and close palettes as well as access the 4 user configurable workspace memories that let you save and restore custom workspace configurations on the fly.

Source Area



The top left corner of the main Studio Artist window is the Source area. There are 4 different options available in the source area via tabs. These are Image, Color, Palette and Gradient. They control the color source for painting. A small representation of the Source Image is displayed there when the **Image** tab is selected.

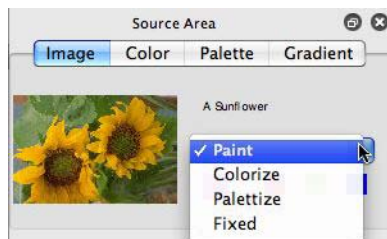


The source display can be switched to **Color**, which allows for user specification of color from a color picker. When the Source Image is active, the initial paint color source is cloned directly from the Source Image. When the Fixed Color picker is active, the initial paint color source is the user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

If you double click on the fixed color picker a more advanced color picker dialog will appear.



The second popup available when Source Image is active allows for some additional color options.



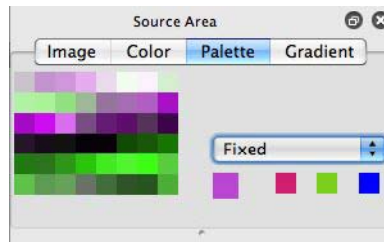
Paint clones color directly from the source image.

Colorize uses the current fixed color to colorize the source image.

Palettize chooses the best representative color from the current Source Color Palette described below to paint the source image.

Fixed uses the current fixed color for drawing and ignores the source image.

You can mouse down in the source image while holding the c hotkey to choose the current picked or fixed color based on the source image colors.



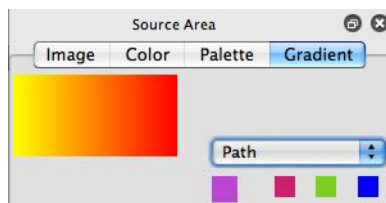
Source **Color Palette** is a set of individual color memories arranged as a series of colored squares in the source area. Clicking on a colored square selects that color as the current source color. Option-clicking on a colored square will record the current source color into that square.

The **Fixed** setting draws with the chosen palette fixed color.

The **Palettize** setting chooses the best palette color to represent the source image at a given location.

The **Random** setting chooses a random color from the palette for drawing.

A complete color palette can be imported or exported with the "File: Import: Import Source Color Palette..." and "File: Export: Export Source Color Palette..." menu commands. Sets of color palettes can also be algorithmically modified or generated using the "Edit: Palette ..." menu commands.



Source **Color Gradient** is an editable color gradient (think of linear transitions between a series of colors) in the source area. Option-clicking in the color gradient bar records the current Source Color into that location in the color gradient. Cmnd-Option-clicking a color in the gradient bar erases that color from the gradient.

There are several hot keys available for editing the current color memory, Color Palette and Color Gradient. They include 'h' for hue editing, 'l' for luminance editing, and 's' for saturation editing.

Color Memory Buttons

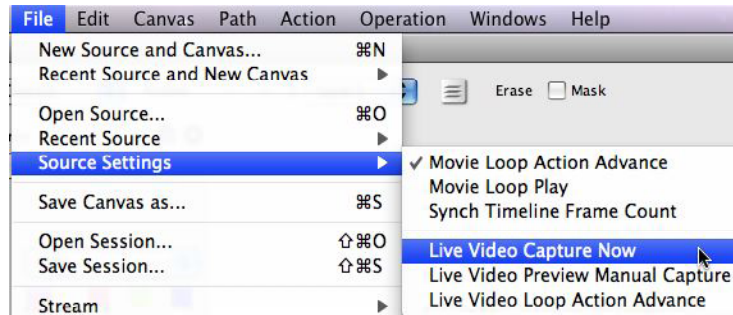


Four color memory buttons are also located in the source palette. The large one on the left displays the current source color. The three smaller colored squares on the right are color memories, and can be used to store and switch between paint colors while working. They are also used as color sources for certain Image Processing or Region Fill operations that require the specification of multiple colors.

Memory buttons are used throughout the Studio Artist interface to provide easy storage and playback of any editable parameters. Memory button 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 interface controls.

Some of the memory buttons available in previous version of Studio Artist are accessed via menu commands in version 4. For example, all of the Paint Synthesizer path memory buttons that used to be in the secondary control area are now accessed via menu commands in the Edit : Paint Synthesizer menu.

Live Video Input



Studio Artist allows for live video capture into the source image area. You can either use Apple's iSight firewire camera, or a firewire camcorder or other video Quicktime based video input device. You can turn live video capture on using the appropriate menu flags in the File : Source Settings menus.

The 3 live video source settings menus allow you to capture a source frame immediately, drop into live video preview manual capture mode, or capture a live video frame automatically at the beginning of each cycle in a loop action or animation cycle.

When you first enter live video preview manual capture, a live video preview will appear in the Source area image display. If you click on the live video preview image, you can capture a still frame off of the live video feed to use as a source image for painting or other processing within Studio Artist.

Clicking the static captured image will cause the live video preview to start up again until you either click the preview image or start painting in the canvas.

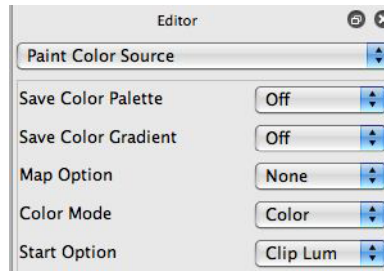
Gallery Show



Gallery Show is a new v4 feature. You can use the gallery show preferences to configure Studio Artist to operate in different ways when running a gallery show. The basic idea is that gallery show presentation mode provides a way for you to configure Studio Artist to automatically run unattended (perhaps in an art gallery) while generating an endless variety of new art work.

The Gallery Show performance presentation features also allow for live video capture when running gallery show. When used in this way Studio Artist would capture a live video frame, then generate a painting off of the captured frame, then repeat this process indefinitely.

Editor



Each operation mode has an associated set of individually editable parameters that can be navigated by popup controls in a generic Editor palette. Changing the operation mode will change the set of control panels and controls available in the generic Editor palette.

Some operation modes have more than one control panel. You can use the popup menu at the top of the Editor to move between different control panels associated with a particular operation mode. Individual control panels 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 check boxes.

This area is where you'll do all of your preset patch design and editing.

Working Canvas

The working Canvas takes up the center 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.

Operation Toolbar



The Operation Toolbar is used to select the current Operation mode via the left side operation popup. You can also use the Operation main menu to switch between different operation modes and their associated editor control panels.

To the right of the operation popup is the Action button. Pressing the Action button will run the automatic action associated with the current operation mode (if there is one, for example warp and adjust do not currently have actions).

The plus and minus buttons to the right of the Action button are used to zoom the current view in or out of the Canvas. The numeric indicator directly to the right of these two zoom buttons indicates the current zoom ratio. A display of 1 means a 1:1 view ratio (i.e., no magnification). A display of 2 means a 2:1 magnification. A display of 0.5 means the view is half the size of the actual Canvas.

The popup to the right of the zoom controls is the current layer popup. You can use it to switch between any of the individual layers associated with the canvas. The Layer palette provides a complete editable list of the available layers.

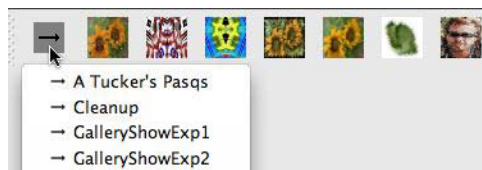
The View icon to the right of the layer popup lets you adjust the canvas view between current view and view all.

The Erase button will erase the current layer to the default background when pressed. You can set the default background via the Canvas : Default Color menu.

Shift clicking the Erase button will perform a complete erase, which means it also erases the bezier path frame associated with the layer, erases the current internal blanking buffer (used in paint synthesizer) and resets the layers alpha channel to full off.

The Mask checkbox turns selection masking on and off. When it is turned on, then any areas of the canvas not currently selected will be dimmed in the display. When masking is on, then any actions in the canvas will be appropriately masked. The Canvas : Layer : Paint Mask Type menu determines the behavior of the selection mask when working with the paint synthesizer.

Favorites Preset Toolbar



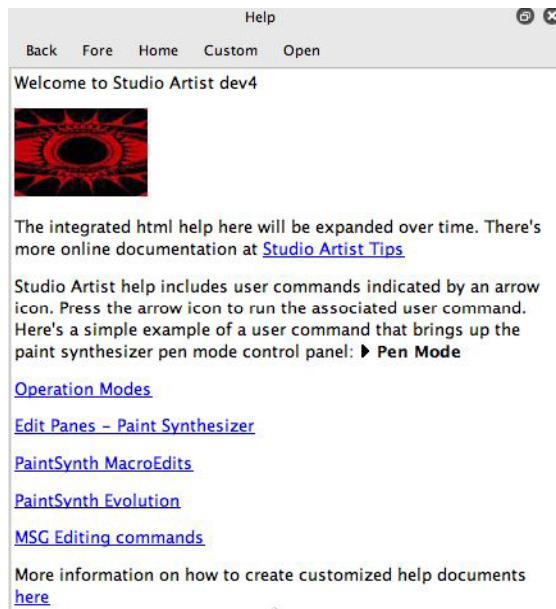
The Favorites Preset Toolbar is a compact space saving toolbar you can use to custom organize presets that are useful for your personal workflow. You can create your own Favorites categories to help in this organization by using the **Edit :Preset :Make New Favorites Category** menu command. To add the current preset to the current favorites category you can just drag and drop the current preset icon in the main preset browser into the favorites preset toolbar.

One nice feature associated with Favorites presets is that you can mix and match different preset types in a single favorites category. So you aren't restricted to just paint presets or just image processing presets in a given favorites category, which is the case for the normal factory preset categories.

Note that favorites presets are organized by category only, not the dual collection-category folder hierarchy associated with the factory preset types associated with specific operation modes.

Favorites presets replace the more limited but popular functionality of the preset memory buttons that were available in previous versions of Studio Artist in the main preset browser.

Help Palette



The Help palette is a html help browser integrated directly into Studio Artist. There are a set of factory help pages provide by Synthetik that will be expanded over time. You can also create your own custom html help documents (accessed via the Custom button in the toolbar at the top of the help palette). You can use custom help pages as a way to document, organize, and access your own personal preset collection, or to set up personal crib notes that document features or techniques associated with your personal workflow.

In addition to providing access to html help pages, Studio Artist help can include user commands that when pressed cause some immediate action to take place within Studio Artist. These actions can be as simple as switching to a specific operation mode to more elaborate commands like performing paint synthesizer macro edits or MSG editing commands or loading specific preset files.

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 5.0 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. *These five folders must be located in the same folder as the Studio Artist application.*

Studio Artist looks for the various operation mode presets in a '**Preset**' 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.

Studio Artist looks for factory interactive Help files in the '**doc**' folder located next to the application.

Studio Artist looks for your custom interactive Help files in the '**custom**' folder located next to the application.

Studio Artist looks for plugin libraries it needs to run in the '**plugins**' folder located next to the application.

It's extremely important that you keep the Studio Artist application files in the main Studio Artist folder along with all of the preset, help, and plugin folders discussed above. The application needs to reside in the same folder as these other folders so that it can find all of your presets, brush, and help information and display it appropriately in the Studio Artist interface.

If you are running Apple Mac OS-X

You need to run OS-X 10.6.8 or greater to work with Studio Artist 4. If you use a Wacom tablet you will need to download the appropriate tablet drivers from www.wacom.com if you do not already have them installed on your computer. Follow the instructions that come with the Wacom drivers to install them.

Version 5 does not support Classic OS 9. You would need to run Studio Artist 3.5 if you have one of the older mac models running Classic OS 9.

In general, the more memory you can pack in your OSX machine the better. Studio Artist runs much more quickly when running directly out of RAM memory under OSX as opposed to having to resort to virtual memory swaps onto free disk space.

If you are running Windows

Studio Artist currently runs on Windows XP, Vista WIndows 7, 8, 10.

You need to install Quicktime for Windows on your Windows computer if it is not already there. Studio Artist makes extensive use of Quicktime for movie playback and processing as well as image file import and export. You can download a Windows Quicktime installer from Apple's web site at www.apple.com/quicktime .

This manual is generated using Studio Artist screen shots taken on an Apple computer. However, the Studio Artist interface is identical on Apple and Windows (other than being displayed using Windows native controls rather than Apple native controls).

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. After a few seconds the main Studio Artist interface will appear. Studio Artist boots into the Paint Preset Operation control pane the first time you startup.

At this point you might want to take a moment and configure the Studio Artist workspace for your particular monitor setup. You can re-size the overall interface window, as well as drag the various preset palettes around to different docking locations in the interface (or make them floating palettes if you have a dual monitor setup).

2. If you wish to work with a source image, run the **File : New Source and Canvas** menu. A dialog will come up that lets you choose a source image. The source image you choose can be smaller than your working canvas size.

Then, a dialog will come up that allows you to specify the working Canvas size. Typically, you might choose a Canvas size different than the original Source Image. The Source Image is not modified in any way. The Canvas Image will be the final output image.

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.

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 Preset, click on one of the colored Paint Preset icons in the Preset Browser (located on the left side of the main Canvas window when you first startup Studio Artist). You can use the **Collection** and **Category** popups to choose a new preset collection and

it's associated category. Every time you change to a new Paint Preset, the look and feel of the current paint tool will totally change.

Working your way through the various Paint Presets (there are over 4000 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.

You can create your own custom preset Favorite categories and then drag and drop presets you like into these custom favorites categories as a technique to aid in accessing preset you like. You are also free to make your own collections and categories in the factory preset set and custom organize presets as you see fit for your particular workflow.

All paint presets have the option of being used in different ways. You can draw manually using the mouse or Wacom pen and tablet. Or you can press the Action button and watch them draw automatically.

Some presets may have been designed primarily for action drawing, others for manual drawing. Manual drawing presets may also have specific interactive behaviors missing or limited when used with a mouse.

When exploring new presets it is often a good idea to try both approaches to get a sense of the range of possibilities available with that particular preset. Keep in mind that you always have the option of editing the way a particular paint preset automatically draws if you would like it to behave differently.

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. Image Operations is a good one to start with. Image Operations are different image processing effects that run as Actions (the pen or mouse is not used).

Hint:

Cmd R and the “**spacebar**” are used throughout the program as a means to quickly perform certain actions. You can always use “**Cmd-R**” to execute the current Operation’s Action as an alternative to the Action button. You can use the “**spacebar**” to stop any currently executing Action. Studio Artist also uses the “**spacebar**” hot key to execute or complete any interactive edits that use interactive pressure from a pen. This allows you to execute a pressure sensitive edit without losing your pressure setting during the pen up operation.

System Requirements

Minimum Requirements:

Apple Computers:

- Power Macintosh with 128 MB of RAM or more
- System version must be 10.6.8 or higher.
- QuickTime.

Windows Computers:

- Windows Compute with 128 MB of RAM or more
- Windows XP, Vista, Windows 7, 8,10 operating system.
- Windows QuickTime 7.0 or higher.

If you need to instal Windows Quicktime on your Windows computer you can download a Windows Quicktime installer from www.apple.com/quicktime .

We Recommend:

Modern Macintosh running OSX with 2 gig of RAM or more
Large Screen flat panel display
Wacom Intuos tablet for best interactive painting experience

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. Also check the Studio Artist Tips and Studio Artist User Forum web sites. If you can't find the answer and do contact Technical Support via email, please provide your serial registration number and a detailed description of the problem.

Technical Support

Registered Studio Artist owners are entitled to receive reasonable **email** technical support. Any program bugs or inconsistencies should be reported to techsupport@synthetik.com.

Questions related to achieving certain artistic effects or learning the program should be directed to the Studio Artist Users Forum at studioartist.ning.com, which is accessible from the links section of our web page. Synthetik monitors the forum every day as do a large group of expert Studio Artist users. We're all more than happy to answer your questions and offer advice and suggestions.

There is a Technical problems chapter in this User Guide. You should check there first for answers to common technical questions.

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 support link for detailed instructions, tips and troubleshooting help.

<http://www.synthetik.com/>

Technical support is provided via email. Please include your Studio Artist serial number in your email, along with a detailed description of the problem.

You can email technical support at: techsupport@synthetik.com

You must supply your Studio Artist Serial Number to receive Technical Support. If you do experience a crash problem, please include the Studio Artist crash log in your email report (located in Users/yourname/Library/Logs/CrashReporter). It's the best tool we have to understand your problem and to fix it for you quickly.

The Synthetik web site www.synthetik.com includes a large number of tutorials, technical tips, links to user forums, additional presets available for download, and other user's web sites and art work. Become a part of the on-line Studio Artist community at the Studio Artist user forum and have your questions answered by Studio Artist expert users.

Also, don't forget to check the Video Training Tutorials if you need help understanding something.

Registration

It's important that you register online at www.synthetik.com. You need to register in order to qualify for technical support and future program and documentation updates. You can also email your registration information to admin@synthetik.com. Please include your name, address, phone number, email address, and serial number when registering.

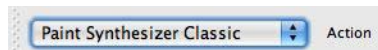
In the past we have offered free program updates and valuable information to registered users. If you are not registered we have no way to get in contact with you with this kind of information regarding updates and program enhancements. Registration information remains Synthetik Software confidential and is not given out to any third parties.

Chapter 2: Operation Modes

Studio Artist is based around the metaphor of a graphics synthesizer. 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 aesthetic.

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.

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 **Pen Modes**. The user can choose the desired type of interaction (Operation and associated Modes) with popups.



The Operation popup is located in the Operation Toolbar. The Action button next to the Operation popup initiates the Operation's associated automatic Action if there is one.

Hint:

All of the Studio Artist Operation Modes and their various associated editable control panels can also be accessed via the main Operation menus located at the top of the screen in the menu bar.

Editor control panels are associated with the following types of modal Operations:

Image Operations

Temporal Image Operations

Texture Synthesizer

Vectorizer

MSG

...

Paint Synthesizer Classic

Dual Mode

...

Warp

Adjust

...

Selection

Bezier

...

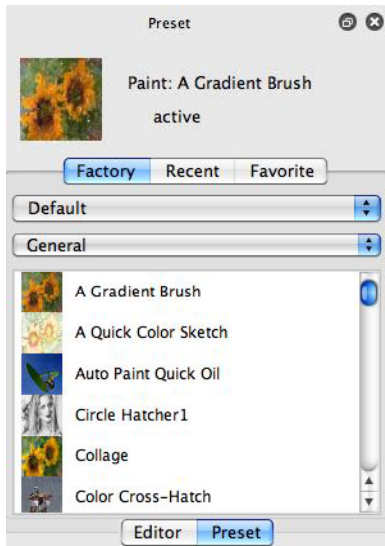
Paint Action Sequence

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

Users can navigate through a hierarchy of control panels to edit parameters associated with the current Operation mode. Individual parameter panels are accessed by using text popups located at the top of the parameter panel. A complete collection of editable parameters is called a patch. A patch stored as a file on disk is referred to as a Preset.

Preset and Patch terminology may be mixed together in the documentation, but both refer to the set of editable parameters associated with an operation. Preset refers to the set of parameters stored on disk in the preset file. Patch refers to the set of parameters currently being edited, which may vary from the values stored in the preset file once a user starts editing.

Presets



Presets are predefined patches stored as files on your hard disk. You can organize your presets according to **Collection**, **Category** and the individual preset names within a Category. The Category name is the name of a subfolder in a particular Collection folder and its associated Preset files are located within the category subfolder.

Collections provide a means to organize a set of Categories and their associated Presets. The Collection name is the name of a folder at the top level within a particular preset folder and its associated Category are folder names located within it.

Collections are the first level of folders located within the specific operation's preset folder. Categories are the second level of folders located within each Collection folder.

Don't store loose presets directly in a collection folder, store them in a specific category folder located within a given collection folder or they will not be found by Studio Artist.

There are eight different kinds of presets in Studio Artist. They are all stored in specific

folders contained within the main “**Preset**” folder located next to the Studio Artist application.

Paint presets are a complete set of parameters for the Paint Synthesizer Classic. They are stored in the “**Paint**” folder located in the main Preset folder.

Image Processing presets store parameters associated with a particular Image Processing Operation. They are stored in the “**ImageOp**” folder located in the main Preset folder.

Temporal Image Processing presets store parameters associated with a particular Temporal Image Processing Operation. They are stored in the “**TemporalIpOp**” folder located in the main Preset folder.

Texture Synthesizer presets store parameters associated with the texture synthesizer. They are stored in the “**TexSynth**” folder located in the main Preset folder..

MSG presets store parameters associated with MSG processing effect objects. They are stored in the “**MSG**” folder located in the main Preset folder..

Vectorizer presets store parameters associated with the Vectorizer. They are stored in the “**Vectorizer**” folder located in the main Preset folder.

DualMode presets store parameters associated with the Dual Mode operation. They are stored in the “**DualMode**” folder located in the main Preset folder.

Paint Action Sequence presets are a set of actions that can be applied to the current Canvas. They are like macros or scripts and can include multiple paint actions as well as image operation actions, warp actions, etc. They are stored in the “**PASeq**” folder located in the main Preset folder..

Important:

The Studio Artist application always needs to be located on your hard disk in the main Studio Artist folder next to the main preset folder. Failure to do this will result in Studio Artist being unable to find your presets at startup.

You can access Presets by choosing from the **Collection**, **Category** popups, and then clicking on the appropriate patch icon in the scrollable icon list. The set of named icons in the scrollable table corresponds to the patches located in the currently selected Category folder.

When you export a new preset to one of the Studio Artist preset folders, the new preset will not immediately show up in the associated Collection: Category: Patch popups and icon table. To reload the preset information to accurately reflect any changes made to the Preset folder contents, just reset the Category popup.



You can edit or overwrite an existing current preset by option clicking the large current Preset Icon. The icon image itself will not be overwritten. You can use the **“Edit: Preset: Update Current Preset Icon”** menu command to overwrite the icon with the current Canvas image.

A text label located on the right side of the Preset Icon shows whether the current Preset is **“active”** or **“edited”**. Active means the Preset is loaded into the Paint Synthesizer and all of the Paint Synthesizer settings match those stored in the Preset file. Edited means that some of the settings in the Paint Synthesizer are different from those stored in the Preset file.

Option clicking the Preset Icon will update the current Preset file with the current

settings of the Paint Synthesizer and the text label will change from ‘Edited’ to ‘Active’ to reflect this change.

Shift clicking the Preset Icon will bring up a Save File as dialog at the location of the current preset in your Preset folder so that you can save a new preset with the current settings of the Paint Synthesizer. Shift clicking is also a useful way to save copies of an existing preset into your own customized collection/category folders. Cmnd Shift clicking the Preset Icon will bring up a Save File as dialog at the top of the factory preset hierarchy, again a useful working shortcut.

Hints:

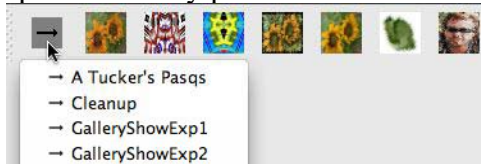
You can import a Preset file located anywhere on your hard disk by using an import menu command. You can export or write a preset to a file on your hard disk by using an Export menu command.

The preset import and export menu commands are also accessible from the contextual menus available if you control click either the main preset control panel or the associated operation mode editing control panels.

You always have the option of either dragging a preset file directly from the finder to the Studio Artist dock icon as an alternative to importing the preset. Or you can double click on a preset file in the finder and it will open in Studio Artist as the current preset.

Favorites:

Favorites presets are a way to customize your personal preset collection or to organize specific factory presets that are useful to your personal workflow.



Favorites presets can be accessed via the Favorites tab in the main Preset browsing palette. Favorites can also be accessed via the Favorites Preset Toolbar.

Favorites are organized by Category. You can add your own favorites category by adding a new folder to the Favorites folder in the main Preset folder. Or you can run the **Edit :Preset :Make New Favorites Category** menu command. Note that favorites are organized by category only, not the dual collection - category hierarchy used for the factory operation mode preset types.

To add the current preset to the current favorites category, just drag and drop the current preset icon onto the favorites preset toolbar.

Favorites replace the old preset favorites memory buttons that were available in previous versions of Studio Artist.

Custom Preset Help:

You can build your own custom preset help pages by using the features of the integrated Help palette. The Help palette displays html help pages. Pressing the Custom button at the top of the Help palette goes to your personal custom index page, which is called startDoc.html and is located in the custom folder (located next to the Studio Artist application in the main Studio Artist folder on your hard disk). You can design a custom preset help page using any html editor to include notes on how to use the preset or what it looks or behaves like as well as example images that show off how the preset looks or draws.

You can also include an active command tag link in the html source for a custom preset help page that will automatically load the preset when pressed. To load a load preset active tag for the current preset onto the clipboard, run the Edit :Preset :Current Preset Command Tag to Clipboard menu command. You can then switch to your html editor and paste the active command into a link field for the custom help html page you are editing.

Custom preset help pages are a powerful advanced feature available in Studio Artist 4 and you should take advantage of them to help access, document and organize your personal preset collection.

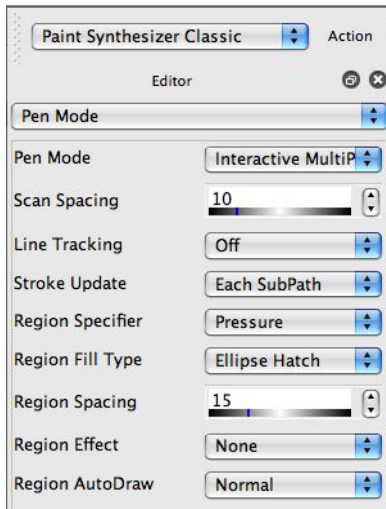
Help Messages:

Each preset has an associated help message. To read the message, click on the ? icon next to the current preset's image icon. A 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 '**Edit: Preset: Update Current Preset Help Text**' menu command. Or, you can just option click the ? icon to directly access the preset help message editor dialog.

Paint Synthesizer



Studio Artist is based around the metaphor of a graphics synthesizer. A user can construct editable paint patches that allow for an unlimited number of potential visual appearances and interactive behavior. Users familiar with audio synthesis or music software will notice many similarities between the Paint Synthesizer and more conventional music or audio synthesizers.

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

Paint Synthesizer Patches are complete sets of all of the editable parameters associated with the Paint Synthesizer. There are over 470 of these editable parameters. These editable parameters are organized into a series of parameter control panels. A parameters popup below the main operation popup is used to switch between the different parameter control panels.

Paint Synthesizer Patches can be imported or exported to disk as individual files. They can also be accessed as Paint Presets from within the Studio Artist Presets operation mode interface.

Any Paint Preset files that are placed in a Category folder in the **Paint** folder contained in the main **Preset** folder next to the Studio Artist application will appear as Paint Presets within Studio Artist. The first level of Subfolders within the Paint folder will appear as **Collection** headings. Subfolders within the Collection folders will appear as Paint Preset **Category** headings for a given Collection. Use these Collection and Category sub folders to custom organize your Paint Presets.

Studio Artist ships with over 4000 factory paint presets. However, you can easily edit these to customize them or you can build your own from scratch. Spend some time looking through the different factory presets and don't be afraid to customize the names or the collection and category arrangements to suit your own individual work needs.

Building Custom Art Processes with Multiple Paint Presets

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

Studio Artist's Paint Action Sequences are unique in that they can be a stylistic script as opposed to just a literal representation of your actions like scripting environments in other graphics programs. This becomes especially useful if you want to process sets of different source images or video frames with a Paint Action Sequence. Studio Artist's Intelligent Assisted drawing will automatically analyze the individual images or video frames as the Paint Action Sequence plays back, creating a unique representation of the original style you recorded that matches the source material currently being processed.

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

Image Operations



Image Operations are a set of image processing effects that each have unique editable parameter panes. There are a large number of different image operations that cover a wide range of special effects as well as utility image processing functionality. The current Image Operation is initiated by pressing the **Action** button (or by using the **Cmd R** hot key command).

They act to transform an image that is specified as the current IP Source. The IP Source can be the current Canvas Layer, a specific Canvas Layer, the Source Image, the current Region Selection, or the Current Layer Alpha Channel.

Typically the end result of the image operation is placed in the current Canvas Layer. This can be overridden to place the result directly into the current Region Selection or current layer's alpha channel with the appropriate Composite setting.

Each Image Operation also has a compositing operation and mix control located at the bottom of the parameter pane. Compositing operations take the output of the Image Operation effect and the image already in the working canvas and can combine them

together in different ways before the result replaces the current working canvas.

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. For example, a blur effect can be changed into a sharpening effect by changing the compositing from Replace to Edge. Changing the Ip Source to something other than the current Layer also increases the range of possible effects that can be created even more.

You can also specify a specific number of repetitions of a particular image operation. This will repeat the effect N times automatically in one action step. Some image operations give interesting results when run repeatedly on the same image.

You can use Image Operation Presets to access a given Image Processing Operation and its associated editable parameters at the touch of a button. Like all Presets in Studio Artist, they can be organized and accessed by Collection, Category, and Preset name.

Paint Action Sequences can also be used to combine together different Image Operations in a series to generate more complex visual processes.

Hint:

The main Operations menu provides access to all of the Image Operations either by alphabetical ordering, or by type of effect for ease of access when working.

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

Temporal Image Operations



Temporal Image Operations are a set of time-based image processing operations. Time-based means that they work using multiple frame images as input to generate an output at a specific frame time when processing a source movie.

They are designed to work with a loaded source movie, and will not really do anything if you do not have a loaded source movie.

Processing a movie file with a PASEq is the equivalent to loading a source movie so temporal ip ops will work as individual action steps in a PASEq designed to process movie files.

All of the normal compositing options available for Image Operation effects are also available for Temporal Image Operations.

Texture Synthesizer



The Texture Synthesizer is based on an underlying resolution independent procedural texture synthesis engine. There are a large number of editable parameters that can be used to define the visual characteristics of the generated texture field. The texture field may be placed directly in the Canvas and used as a finished abstract artistic image or it can be used as the basis for a large number of texture-based image processing or animation and video effects.

Some Image Operations that provide Texture Synth modulation options may incorporate the Texture Synthesizer as an extended part of their editable parameters and overall visual effect.

Extensive editable modulation options are built into the texture synthesizer. A source used for modulation could be the current Source image, Canvas image, or various visual attributes associated with them. By modulating parameters over time using Paint Action Sequence timeline keyframing, dynamic abstract textural imagery can be generated and used as the basis for dynamic animation or video output.

See Chapter 5: Texture Synthesizer for detailed information on how to use the Texture Synthesizer.

Vectorizer

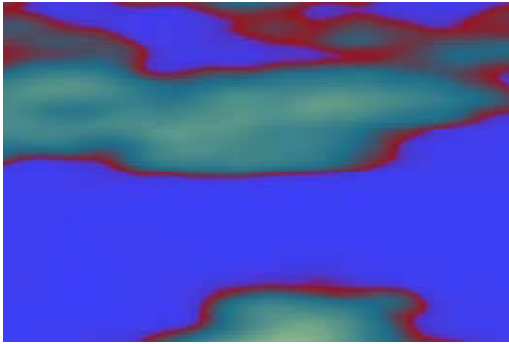


The Vectorizer is a raster to vector conversion synthesizer. It can be used to generate a realistic vector representation of a raster image. Or it can be configured to create artistic vector effects.

Vectorizer output can be rendered into the normal Studio Artist raster working canvas layers. The normal image operations style compositing options are available in version 4 for compositing your vectorizer output into an existing raster canvas.

The Vectorizer can also generate vector eps or svg output to an external eps, svg, or pdf file. The individual Bezier paths associated with each generated vector region can also be recorded to the current Bezier path frame.

MSG - Modular Synthesized Graphics



MSG stands for modular synthesized graphics and is Studio Artist's modular image processing architecture. There are over 500 individual MSG processors that can be used to build MSG processing effects. By combining together different MSG processors in a processor chain list you can build an unlimited number of different image or video processing special effects, as well as create abstract procedural art or animation.

MSG presets can also be loaded into the paint synthesizer as MSG Path Start Generators, MSG Path Shape Generators, MSG Brush Load Generators, or MSG Live Source Brushes. This allows you to dramatically extend the capabilities of the paint synthesizer by incorporating your own custom MSG presets into paint patches.

MSG is unique among operation modes due to its totally modular nature. There is a special MSG Advanced Editor palette you can use to build and edit MSG presets. There is also a Evolution Editor you can use to perform directed evolution of MSG presets. These 2 additional editing palettes mirror most of the old MSG Evolver application functionality.

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 an action 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. Horizontal as well as vertical mouse position movements from the initial mouse down start point in the Canvas may interactively change different parameters associated with certain warp types.

Many of the specific warp types are also pressure as well as position sensitive. You can use the spacebar to end an interactive warp operation that is pressure sensitive.

The following editable parameters are available in the Interactive Warp control panel:

Type

Specifies the specific type of interactive warp. Each type setting can produce a very

different warp effect based on how you move the pen from the initial start position and work with interactive pressure.

Warp Quality Settings

There are two different warp quality settings, which are accessed via the Interpolator control in the Warp editor. The 0 order interpolator is faster and doesn't introduce any additional gray levels or colors into the warped image. The 2 order interpolator uses more memory and is slower, but generates a higher image quality rendering of the final warp after mouse up via anti-aliasing which introduces additional gray levels into the warped image. This may take a few seconds to compute depending on the Canvas size and interactive warp type.

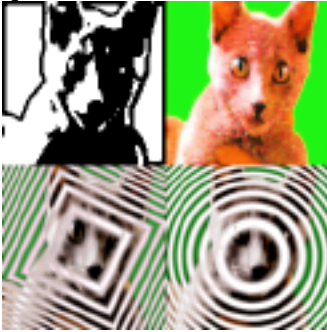
Hot Keys

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

's' - used to fine tune a warp by slowing down the effect of pen or mouse movement.

'spacebar' - used to execute the current warp without lifting the pen or changing the pen pressure.

Adjust



Interactive adjustments are dynamic image processing operations 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 to interactively adjust the visual appearance of the current Canvas or to add interactive gradient effects.

Simply choose a specific adjustment type and use the pen or mouse to dynamically control the specified operation. Some of the specific adjustment types are pressure as well as position sensitive. Horizontal as well as vertical mouse position may change parameters associated with certain adjustment types.

The following editable parameters are available in the Interactive Adjust control panel:

Type

Specifies the type of interactive adjustment.

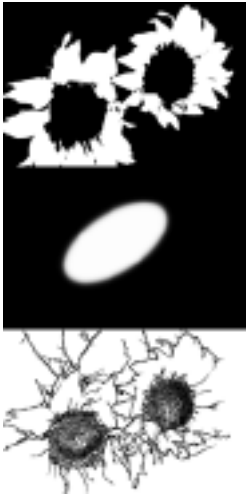
Hot Keys

't' - used to translate or move the start position of a adjustment.

's' - used to fine tune an adjustment by slowing down the effect of pen or mouse movement.

'**spacebar**' - used to execute the current adjustment without lifting the pen or changing the pen pressure.

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.

The current selection can also be used to generate an alpha channel for movie output. Selected regions of the Canvas can also be moved within the current layer by using the “**m**” hot key when in region selection operation mode.

Mouse or pen down on the Canvas to dynamically select an area based on the current Interactive Generation settings. These settings include common selection methods such as rectangular and lasso selection as well as dynamic region growth based on visual attributes such as color or image texture energy.

The current selection is displayed as a solid color on a grayed out background on the current Canvas. Using the **spacebar** to finalize the interactive selection is the same as releasing the mouse or pen.

After interactive selection generation, all unselected areas of the Canvas will be grayed out while in this Operation mode. To extend the existing selection, use the “**shift**” hotkey. To remove from the existing selection, use the “**option shift**” hot key.

When in other Operation modes within Studio Artist, unselected areas will only be grayed out if Region Masking is turned on. You can turn on and off Region Masking with the **Mask** checkbox located in the Operation Toolbar. If Region Masking is turned on, then operations will only take place within the masked regions.

Region masking is explained in more detail in the next section.

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 Operation Mode of the program to momentarily drop back into Region Selection to generate a region on the fly. The current Region Selection **Pen Mode** setting will determine the type of Region Selection performed during this momentary operation.

Region Masking

The current region selection can be used at any time as a mask for different Operations within Studio Artist. This includes painting, image operations, and interactive warping or adjustments. To turn on Masking, use the Mask popup located above the top left of the Canvas.

Setting the Canvas : Layer : Paint Mask Type to Paint currently masks interactive painting or paint actions with a hard mask. Setting the Paint Mask Type to Path masks the path associated with any painting, but not the actual brush fill process. This results in a more natural appearance that looks like it was actually hand painted rather than artificially masked.

Both Paint and Path masking work the same for image processing and interactive warping. Feathered selection regions work with image processing and interactive warping operations. Feathering does not currently blend for paint operations.

Litho masking is used with wet paints made using dual Paint Fill Apply fill algorithms. Dry paint is masked within the current selection region while the wet or wipe part of the paint tool is unmasked. This allows you to build paint tools that simulate the effect of different print making technologies where ink is first printed onto an application plate and then rubbed or burnished on to a paper surface.

The status of Masking is recorded in a Paint Action Sequence for any recorded Action steps. When you playback a Paint Action or History Sequence, masking will turn on and off as appropriate if the Mask Parameter (located in the Paint Action Sequence Generic Editor control panel)is turned on.

The mask used in playback will be the current selection region. You can explicitly record Region Selection Action Steps to incorporate the mask selection process directly into a Paint Action Sequence.

Hint:

You can use Cmnd Y to toggle the region mask popup setting on and off without directly using the popup control.

Bezier

The Bezier operation mode provides a way to draw or edit the Bezier Path Frame associated with each layer. Each Canvas Layer has its own individual Bezier Path Frame, which is separate from the actual RGBA image planes also stored in a layer. The Bezier path frame is not displayed in the canvas unless you are in this operation mode.

Bezier Drawing

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 and tilt information will be stored along with the path. If you are using a mouse, the default pressure and tilt settings will be stored with the path.

There are two sets of two different drawing modes for Bezier Draw. Freestyle pen mode allows a free form curve to be drawn that is then converted to a Bezier path representation at mouse up. Bezier Curve mode allows a Bezier path to be built up by interactive insertion and positioning of Bezier control points.

You can either draw Bezier paths or closed Bezier Regions. Each of these path options can be drawn using freestyle or curve modes.

If the Path Layer Record Settings menus are set appropriately, you can record Bezier paths while drawing in the Paint Synthesizer or Paint Synthesizer Presets. The Vectorizer region output can also be recorded into the current Bezier Path Frame if the Path Layer Record Settings menus are set appropriately.

Each Canvas layer has an associated Bezier Frame that contains all of the active Bezier Paths currently associated with that Canvas layer. Switching to a new Canvas layer will also switch to its associated Bezier Frame. Switching the current Operation to Bezier will display the contents of the current Layer's Bezier path frame on top of the layers component RGBA image in the canvas view.

The current Bezier frame can be used in several different ways. It can be a scratch pad for editing existing paint paths stored in a Paint Action Sequence. It can be used to interactively define paths for subsequent painting with the Paint synthesizer. It can be used for editing individual paint stroke paths stored in a Paint Action Sequence.

The shape and position of Bezier paths can also be animated over time. Bezier paths can also be used to generate selection regions or masks.

Bezier paths can be drawn with the current Paint Synthesizer settings using the 'Path : Paint Paths' menu command. Bezier regions can be filled using the same menu command along with a Region Fill as Brush pen mode. The fill can use raster paint when filling to the canvas or can generate an EPS region if you are running a menu command that generates an EPS file from a Paint Action Sequence.

If you wish to edit a Bezier path after you draw it, you need to switch to the Bezier Edit control panel. You can use cmd 5 to switch back and forth from your current Operation to Bezier Op Mode for quick edits on the fly.

See the Chapter on Bezier Paths for more information on Bezier Draw and Bezier Edit.

Bezier Editing

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.

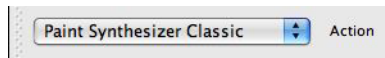
You can use the mouse or pen to select individual paths by touching them or groups of Bezier paths by dragging a selection marque over them. You can directly manipulate the Bezier control points associated with individual paths to change the shape of a selected path. You can also rotate, scale and translate selected curves using hot keys as well as perform more sophisticated interactive edits that change the appearance of the selected paths.

Hint:

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.

See the Chapter on Bezier Paths for more information on Bezier Edit.

Chapter 3: Paint Synthesizer Classic



Studio Artist is based around the metaphor of a graphics synthesizer. Musicians have used audio or music synthesizers for many years to design an unlimited variety of custom sounds and to emulate the sounds of natural instruments. Similarly, a user can construct graphical patches in the Paint Synthesizer that allow for an unlimited number of potential visual paint aesthetics as well as extreme customized paint tool interactivity. So, you have amazing control over both how a painting looks as well as control over how a paint tool responds to your pen drawing movements.

For those unfamiliar with the metaphor, a paint patch is a collection of paint synthesizer parameter values stored in one recordable or savable object. These paint patches can be stored as individual Paint Preset files on disk for easy access later while working.

Paint Synthesizer Classic is an extended implementation of the traditional Studio Artist paint synthesizer in Studio Artist version 4 that allows for full compatibility with pre-version 4 paint presets. In the future there may be additional paint synthesizers with redesigned internal structures and non-compatibility with older paint presets.

This overview will help you understand the structure of the Paint Synthesizer so that you can quickly start modifying existing factory paint preset patches as well as create your own.

Introduction

The Paint Synthesizer allows you to control and use Studio Artist's paint and drawing 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 Studio 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 path defines where drawing is taking place on the Canvas. 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 Studio Artist is painting automatically, then the path is generated by Studio 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 automatically analyzed internal visual attributes.

Use of a graphics tablet and associated pressure and/or tilt sensitive pen or airbrush tool can greatly expand the range of artistic 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 pen pressure, tilt, tilt orientation, tangential pressure, rotation, and velocity can be used to modulate individual parameters within the Paint Synthesizer. In the extreme case, you have the ability to modulate over 480 parameters in real time as you use an expressive drawing tool like a pressure and tilt 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 modulating 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 tools 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 traditional 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 satisfying art without having to take the time and effort to develop significant mechanical drawing skills.

If you have spent years honing and refining your drawing and painting skills and technique, 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.

Many artists and musician develop hand and wrist problems due to extensive over-usage of a computer mouse or manual tools over long periods of time. The use of a pen and tablet along with Studio Artist's intelligent-assisted drawing is a great way to reduce this kind of repetitive stress. Digital painting and image manipulation is also a great way to avoid exposure to toxic chemicals associated with many traditional artistic techniques and media types.

Drawing Engine

The Paint Synthesizer is based on a model of applying dabs (also sometimes referred to as nibs) of paint to the Canvas along a path. How the dabs are applied to the path and the overall 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 adjustments 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 Fill** 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.

A simple dab of anti-aliased paint could be based on a single color as the **Fill From** source and the Canvas as the **Fill To** source. More complex and organic dabs of paint or 3D paint effects can be constructed using **Brush Loading**. **Brush Loading** allows for a wide range of sophisticated image generation and processing algorithms to be dynamically executed on the fly as you draw to create richly textured and organic paint dabs.

The dab of paint is then applied to the Canvas with a particular paint **Fill 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 algorithmically.

Certain painting **Fill Algorithms** that **Mix** may spawn a second interacting **Paint Fill** process with it's own **Compositing** and **Blending** parameters. The power of this sophisticated paint application 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.

Presets

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.

Philosophy

There are no artificial limitations in Studio Artist's 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 kind of generic approach by other companies to providing digital painting tools

really limits your freedom of creative expression.

After all, individual personal expression is really what the artistic process is all about.

Paint Synthesizer Interactive Pen Modes

There are several different interactive pen modes associated with the Paint Synthesizer. Each mode allows you to use the mouse or pen in a completely different way when drawing.

A default Pen 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 pen modes can have a profound effect on the visual appearance and behavior of the resulting interactive paint tool.

The pen mode is adjusted in version 4 in the Pen Mode control panel. In previous versions of Studio Artist it could be adjusted with a special popup control located above the canvas.

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 as you draw.

Certain paint parameters can be modulated by the 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 Path Shape parameter pane are used in Interactive Pen mode to determine path length modulation.

Freestyle

Draws the pen path as a marching ants thin line until mouse up, when the path is then painted. The specified path can be repositioned before it is 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.

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 autodrawn paths that are painted. The autodrawn paths are generated according to the path parameter settings located in the Path Start, Path Shape, Path Angle, Path End, Path Application, and Path Randomization 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 Angle, Path End, Path Application, and Path Randomization 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 effect to generating unique-looking dynamic particle brushes that flow like liquid paint to full intelligent-assisted drawing that might dynamically crosshatch or autosketch an image for you as you manipulate the mouse or pen 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 or tilt. Mouse up or hitting the spacebar then paints the specified region with a series of paths generated algorithmically.

The Pen Mode 'Region Specifier' parameter determines whether pen pressure or tilt is used to interactively grow the region, or if the user just draws a lasso area.

Bezier Curve

Draws the pen path as a marching ants Bezier curve until you mouse up or press the spacebar, 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 'Cmd' key. The 't' hot key lets you translate the existing curve path. The 'r' hot key lets you rotate the existing curve path.

Particle Paint

Autodraws and paints a series of independent paint bush particles that have their own unique movement based on the overall path generation settings.

Particle paint is different than Autodraw Interactive pen mode in that multiple paint paths associated with each paint particle are being drawn simultaneously rather than one at a time sequentially. This has a very different look and feel than Autodraw Interactive, which draws and fills one autopath at a time.

Interactive MultiPen

Paints on the fly using multiple simultaneous interactive pens as you draw. Each of the individual interactive pens tracks the overall movement of the pen or mouse while.

Can be used to simulate the appearance of a real paint brush composed of multiple pen bristles or for special effects like multiple thread weaving or amazing interactive pattern design.

Autodraw MultiPen

Autodraws and paints a series of multipen 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.

Region Draw MultiPen

Similar to Regiondraw pen mode except the region is filled with multipen paint strokes.

Region Draw as Brush

The user interactively specifies a local region with the pen. The local region is then converted to a brush and directly filled with the current paint synthesizer settings. Unlike previous pen modes, the region is directly filled rather than stroked with a path based paint stroke.

This pen mode is the paint mode used to fill vector regions stored in the current path frame. Unlike other illustration programs that fill vector regions with solid color or simple gradients, Studio Artist allows you to access the complete power of the Paint Synthesizer when filling a vector region.

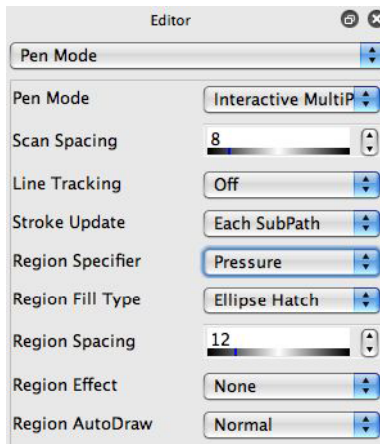
Autodraw Region Draw as Brush

Autodraws and paints a series of filled local regions from the current mouse position. The local regions are generated using the setting in the paint synthesizer path generation section.

The local regions are then converted into individual brush dabs and directly filled with the current paint synthesizer settings. The spacing of new autodrawn regions is determined by the scan spacing parameter located in the Path Start parameter pane.

This pen mode can either be used to auto generate regions used for Paint Synthesizer fills, or to take a vector path and convert it into a flat and possibly stylized vector region that represents the paint stroke and is filled with one overall fill operation as opposed to a series of applied paint dabs.

Paint Synthesizer Editable Control Panes



The Paint Synthesizer is composed of several editable parameter control 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 its associated interactive mouse or pen modes and Paint Actions.

An editable parameter may be associated with a popup control, or a slider and associated numeric edit field. Certain parameters may use range sliders, which have two associated numeric fields for the range slider's minimum and maximum range values.

You can use the control pane popup at the top of the paint synthesizer editor to move between the different control panels. Or you can use the Operation : Paint Synthesizer sub menus as an alternative way to navigate the various paint synthesizer control panels (or any other control panels available in Studio Artist).

Paint Synthesizer Control Pane Organization

The Paint Synthesizer parameter panes are organized as follows:

- Pen Mode
- ParticlePaint Mode
- MultiPen Mode
- Region as Brush Mode

These parameters control specific behavior associated with the different pen modes.

- Path Start
- Path Shape
- Path Angle
- Path End
- Path Application
- Path Randomize

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 its 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 pen mode.

- Paint Color Source
- Paint Color Modulate
- Fixed Colors

These parameters control the overall color of the paint.

The initial paint color value will come from the Source Area section of the Studio Artist interface. Depending on the status of the two popup controls in the Source Area, the color could be a fixed value user selected color, a color specified in a paint palette or color gradient, or dynamically generated from the source image as you paint. This initial color value can then be modulated or transformed by the Paint Color Source and

Paint Color Modulate parameter settings.

Two additional Fixed Colors can be generated as offsets or modulations from the initial Paint Color. The combination of these three dynamic color sources can generate rich paint textures or special effects.

- Paint Source Offset
- Paint Brush Load
- Paint Fill Setup
- Paint Fill Apply
- Alpha Fill

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

Paint Source Offsets can be used to dynamically offset various color or image cloning operations. This can be used to generate subtle color modulation effects in a painting, for rubber-stamp style image cloning, for generating liquid flow paints, and many other application.

Paint Brush Loading allows a dynamic paint image to be generated on the fly. This dynamic paint image can interact with the dynamic brush and Canvas in the subsequent Paint Fill module. An extremely large number of different image processing and generation algorithms can be used to create the dynamic paint image. This allows for a wide range of organic textures, 3D paint and stylistic effects.

Paint Fill parameters determine how the dynamic brush applies dynamic paint to the Canvas. Paint Fill Setup determines how the dab of paint is generated. Paint Fill Apply determines how the dab of paint is applied to the canvas.

Alpha Fill parameters determine how the dynamic brush updates the current Canvas Layer alpha channel.

- Brush Source
- Brush Type
- Brush Modulation

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

An initial Brush Source can be computational, dynamically generative, an image, text, or a movie file. It is then modified by a second dynamic brush generation algorithm.

Brush Modulation allows the size, orientation, and luminance of the dynamic brush to be additionally modulated by pressure, tilt, or many other interactive or algorithmic parameters.

Background Texture

This pane lets you define a dynamic background texture. The dynamic background texture can be used to modulate many different parameters within other parts of the paint synthesizer. Background textures can be used to simulate paper or canvas textures as well as to create rich organic paint effects.

Miscellaneous

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

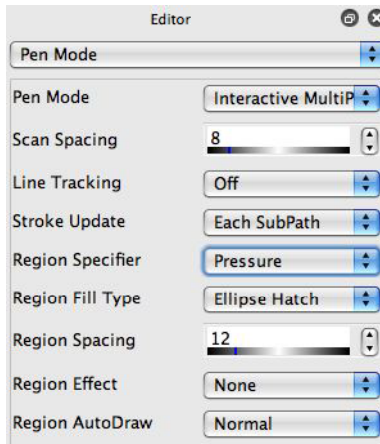
Time Particles 1 Time Particles 2

These panes expand the functionality of the paint synthesizer to generate particle based motion effects over time. If time particles are turned on, then individual paint strokes generated in the first frame of an animation or movie process will persist over time and have individual motion characteristics.

Vector Output

This pane has some parameters that determine how the paint strokes or local paint regions are converted into eps stroked paths or filled regions during eps output. Some of the new v4 vector paint render options can also be accessed here.

Pen Mode



The Pen Mode parameters are specific controls associated with one or more Pen Modes. Particle Paint, MultiPen, and Region Fill as Brush modes are located in their own control panel due to the large number of editable parameters they contain.

Autodraw Mode Parameters

Pen Mode

Determines what kind of pen drawing mode will be used. The visual behavior of the drawing associated with your pen movement can change radically depending on which pen mode you choose to work with. For more information on the specific pen modes and what they do see the previous section on Paint Synthesizer Interactive Pen Modes.

In previous versions of Studio Artist this was a separate popup control above the left part of the canvas. In version 4 it's integrated into the Pen Mode control panel.

Scan Spacing

This parameter specifies the scan spacing for freestyle autodraw and the various autodraw interactive painting mouse modes. By scan spacing, we mean the number of

pixels the pen must move before a new autodrawn path will start.

For example, set it to 0 if you want autodraw interactive to act like an air brush (i.e., continuously generating new paths without moving the mouse) , or 10 if you want a new path to be generated every time the pen moves 10 pixels.

Line Tracking

When line tracking is off the start point for the autodrawn path always immediately jumps to the current pen location. If line tracking is on then the start point for the autodrawn paths will track from the previous start point along a line to the current pen location as long as the pen or mouse is down. The tracking along the line will be spaced based on the scan spacing (a scan spacing of 0 will track at 1 pixel increments).

Stroke Update

Determines whether post-stroke updating takes place for autodraw interactive mouse drawing at mouse up or for each individual stroke. Updates include resetting the Z-buffer and the Undo Canvas, which are used in certain Paint Fill operations.

Region Draw Mode Parameters

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.

Region Specifier

Determines what interactive modulator or drawing technique determines the overall initial region shape. Once the region shape is specified, a path generation algorithm attempts to fill it in with a drawing path specified with the Fill Type parameter detailed below.

The region filling path will then be stroked with paint. Note that this way of filling a region with a path and then painting the path is very different than a solid color region

fill.

Pressure Region interactively grows the region based on the pen pressure. Tilt Region interactively grows the region based on the pen tilt. If either of these 2 specifiers is used with a mouse they default to 50%. You can press the space bar to stop the interactive region growth and paint the region. This is preferable to lifting the pen since that could change the interactive modulation.

Lasso allows you to draw a blinking lasso selection area which is then filled when you lift the pen or press the spacebar.

Note

You can also use the current region selection mode to interactively select a region that is then filled as an alternative to the current Specifier. To do this, hold down the cmd key when mousing down into the canvas when in Region Draw pen mode. Rather than using the current Specifier to interactively select, you will be immediately dropped into the current region selection mode to interactively select the area to be painted.

Region Fill Type

Algorithm to generate a path to fill an interactively specified region. All of these try to fill the region with a path in a different way, so they all have a very different appearance. Try them and you'll see how they all attempt to fill the region in different ways.

The first 10 fill types are also accessible via hot keys 1,2,...,0 when in Region Draw mouse mode.

Region Spacing

Spacing in pixels between adjacent path segments used in the Region Draw path generation algorithm.

Region Effect

This can be used to specify additional post processing effects that will modify the appearance of the Region Fill Type generated path.

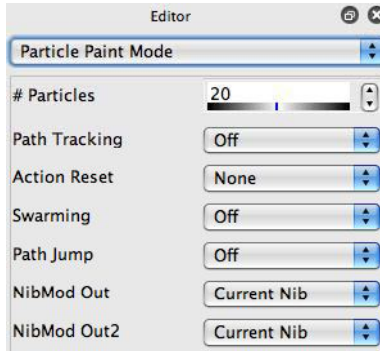
Region AutoDraw

Determines what happens when the Region Draw pen mode is autodrawn. The default original behavior was to do a normal auto draw like with interactive pen mode. The 'simulate lasso fill' option uses the generated path to simulate a manually drawn lasso fill that is then filled in based on the other region draw parameters in this control panel.

Note

The Path Shape control panel Path Type parameter setting called Gen Region Path1 also uses these parameters to generate the path shape using the current region draw Fill Type algorithm.

ParticlePaint Mode



The ParticlePaint Mode parameters are specific controls associated with the ParticlePaint pen mode. This pen mode autodraws and paints a series of independent paint bush particles that each have their own unique movement based on the overall path generation settings.

ParticlePaint Mode Parameters

Particle

Determines the number of independent paint particles used in ParticlePaint Pen Mode. Increasing the number of particles can slow down drawing if the brush size is large, so adjust accordingly

Path Tracking

Determines whether path application spacing tracking is accurate or not for the particle drawing. It was not in version 2 for particle paints, now you can choose.

Action Reset

Various options for the Particle Paint behavior that are only active during Action painting. By changing the setting you can determine if the auto painted particles spill color all over the canvas (none) or track source color more like a normal auto paint

operation (new start point, new stroke).

There can be a big difference between the appearance of manually drawn Particle Paint presets and automatic action drawing for the same preset. Action painting for most particle paints requires a Path Start Repeat Scan setting greater than 1 with the New Start Point setting if you want the action painting to simulate the same effect you would get by using the mouse.

Swarming

Particle swarming allows the individual paint particles to sense and interact with other particles in the swarm as well as to sense and respond to the movement of the pen. Swarming can create extremely rich particle dynamics. Think of a flock of birds undulating as they fly together. The swarming parameters allow you to simulate this kind of real world behavior in the individual paint particles.

This parameters turns the overall swarming behavior on or off. When swarming is on, additional indented parameters associated with the behavior of the particle swarming appear and are specified below.

Distance Option

There are 3 different kinds of calculations that can influence the behavior of an individual particle in a swarm. They are attraction to the pen, attraction to other particles, and repulsion to other close particles.

The 3 distance sliders associated with pen attraction, self attraction, and close repulsion specify maximum distances beyond which the effect for a particular particle combination is ignored. For example, a close distance of 10 specifies that particles closer than 10 pixels will be repulsed from each other but particles that are spaced greater than 10 pixels apart will ignore each other.

Sometimes you may want particles to interact no matter how far apart they are. The Distance Option popup allows you to turn off the distance range for the pen attract and

self attract calculations.

Pen Attract

Controls the attraction of individual particles to the current pen location. Increasing the parameter increases the attraction to the pen.

Pen Distance

Determines a distance range between the particle and the pen location after which attraction to the pen location is ignored.

Self Attract

Controls the attraction of individual particles to each other. Positive increasing values increase the self attraction. Negative increasing values make the particles increasingly fly away from each other.

Attract Distance

Determines a distance range between particles after which their attraction to each other is ignored.

Close Repulse

Controls the repulsion of individual close spaced particles to each other. Positive increasing values increase the close repulsion. Negative increasing values make the close spaced particles increasingly attract to each other.

Close Distance

Determines a distance range between particles after which their self repulsion to each other is ignored.

Repulse Algorithm

Determines the specific algorithm for how particles are repulsed.

...

Path Jump

One characteristic of a real paint or liquid stream is that it may branch or split into multiple sub paths as the stream moves. This phenomena is also observed in nature in

plant or tree branching. Path jumping allows you to model both kind of phenomena in your particle paints.

Turning on path jumping brings up additional indented parameters that determine when individual paint particle paths branch for path jumping. Branching occurs within the original pool of N particles, so if one particle branches into 2 the second branching particle is stolen from another position in the overall pool of particles.

Probability

Determines the probability of an individual particle branching. A setting of 0 % means branching will never occur. A setting of 100 % means branching will always occur.

Start Offset

Determines a random start position offset range for the new branching particle. This new position is offset from the existing particle location for the path that is branching.

Angle Offset

Determines the angular offset for a new particle branch.

Angle Adjust

Determines an overall % adjustment range for the path angle. Setting this to 0 % means the new particle branch angle will always be at the angle offset value. Increasing the setting allows the new particle to fall randomly into the percent range starting at the angle offset with 0 % and moving towards the original path angle at 100 %. So, increasing the setting will introduce more variability into the branching structure.

...

NibMod Out

The MultiPen Nib modulator is used throughout the paint synthesizer. This modulator can also be used with Particle Paint, and the modulation will be based on the setting of this parameter.

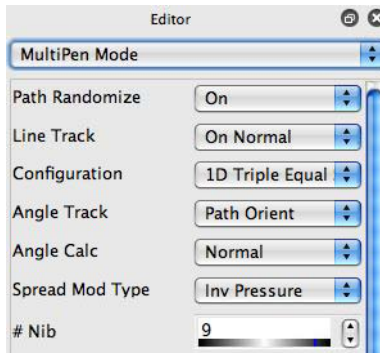
NibMod Out2

The MultiPen Nib2 modulator is used throughout the paint synthesizer. This modulator can also be used with Particle Paint, and the modulation will be based on the setting of this parameter.

Extra Force

Defines an additional force used for generating particle movement. This extra force is added to the main particle movement which is derived from the paint synthesizer path generation controls.

MultiPen Mode



The MultiPen Mode parameters are specific controls associated with the MultiPen Mode. MultiPen Mode simulates multiple brush bristles or what we call Nibs each drawing independently in Interactive Pen Mode. Another way to think of this is having a collection of multiple interactive pens that all draw simultaneously as you move the pen.

Path Randomize

The original multipen implementation in Studio Artist 2 did not support any of the path randomization settings. Studio Artist 3 multipens do support the path randomization settings. This controls turns the overall multipen path randomization on or off. Turning it off means the path randomization settings are ignored like in version 2. We added this control for compatibility with existing version 2 multipen presets.

Line Track

Switches line tracking on or off. On generates continuous bristle paths. Off generates splotchy bristles that skip to the new pen position without drawing lines from the last pen position.

Configuration

Initial start configuration or positioning of the Multipen Bristle Nibs. Think of an

individual nib as being one bristle in a multi-bristle brush. The nibs could be positioned in a straight line to simulate a rectangular shaped brush or in a series of concentric circles or a spirals to simulate a round brush shape. You can also choose random settings that will position the nibs randomly at the beginning of each brush stroke rather than equally spacing them.

AngleTrack

Modulation options for the angle tracking of the nibs from the pen center during drawing. Angle tracking determines how the overall area specified by the initial nib configuration orients itself as you draw.

Angle Calc

Determines whether the angle used for tracking is always updated as you draw or is only calculated at the start of the path.

Spread Mod Type

Modulator for interactively controlling the spread of the nibs from the pen center point during drawing. The nib spreading occurs within the overall shape of the specified nib configuration. Keep in mind that you need to specify a Spread Mod % greater than 0 in order to see any spread modulation effects. And the maximum spread will be determined by the Spread Max parameter.

Nib

Number of bristle nibs used in MultiPen drawing. Be aware that increasing the number of nibs can slow down the interactive draw speed.

Spread Max

Maximum bristle nib Spread in Pixels.

Angle Offset

Fixed offset angle used for angle tracking. This is added onto any dynamic angle values generated by the specified angle tracking algorithm as you draw.

Spread Mod%

The percentage spread adjustment allowed by the Spread Max modulator during tracking. The modulation adjusts the spread down from the full spread setting.

WeaveMod%

Determines the weave spacing if a Weave Type option is on.

Slop Amount

Determines the amount of slop or position slip during tracking. Slop can be used to simulate the effect of paint drip or wet paint spreading. It randomizes the drawn path in a way to simulate these effects.

Slop Type

Determines what is specifically used to compute the slop factor. For example, it could be based on things like interactive pen velocity changes or on quick path angle changes or jiggling the pen back and forth to randomize the nib spacing. The Slop Amount parameter need to be greater than 0 to see a slop effect when drawing.

Config Mod

Defines a modulation source for the multipen configuration. The Nib positioning will vary between the 2D and 1D spacing based on the modulator. This control only applies to 2D configuration settings and will have no effect on 1D multipen configurations.

Weave Type

Determines if Nib Weaving is on and what type if it is. Nib Weaving can be used to simulate real thread weaving, crochet, or macrame patterns. It can also be used to simulate random bristle interaction effects to give a multipen paint stroke more organic character.

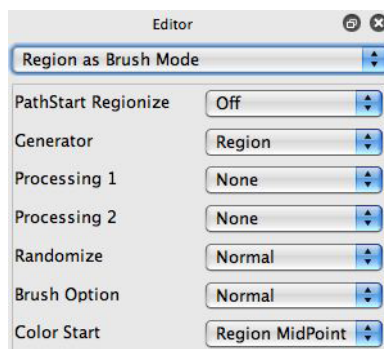
NibMod Out

The MultiPen Nib modulator is used throughout the paint synthesizer, and the modulation will be based on the setting of this parameter.

NibMod Out2

The MultiPen Nib2 modulator is used throughout the paint synthesizer, and the modulation will be based on the setting of this parameter.

Region as Brush Mode



Both the Region Fill as Brush and the Auto Region Fill as Brush pen modes are very different from the other pen modes. All of the other pen modes fill a paint stroke path with a series of paint nibs brushed on to the canvas. Region Fill as Brush allows for a true region fill operation using one paint nib and brush that correspond to the region being filled.

The user can either draw a region manually using the pen or the region can be auto-generated using the Paint Synthesizer path generation parameters. Special processing effects can further modify the region. Up to two different processing effects can modify the generated region. These effects can range from simple smoothing to feathering. Then, the generated region is dynamically inserted into the Paint Synthesizer as the current brush to fill the region.

Unlike other graphics programs that fill a region with a solid color or simple texture or gradient, Studio Artist gives you the full power of the complete Paint Synthesizer to do the region fill. If you incorporate Brush Loading or MSG effects, you can create a wide range of amazing graphics and image processing effects using this pen mode.

Generator

Specifies a number of different generation options for the region. All of these determine how the path is converted into a region. The drawn path could simply represent the boundaries of region, or it could be the input to a generator that then outputs the final region to be drawn. Some of these generators are geometric while others simulate a thick vector paint stroke that is drawn as one region. The Region Draw Generator option uses the Region Draw pen mode Fill Type to generate the region. Full Screen Rectangle allows the Paint Synthesizer to be used to create image processing effects that process the entire image.

The Selection Override generator option is different from the others in that it ignores the path and builds the region brush directly from the current selection region. This option is extremely useful when using region fill as brush pen mode with path start regionization.

The Path Start Grid Scan Generator uses the Path Start Grid Spacing controls to determine the size of the rectangular regions it generates. The top left corner of each rectangle will correspond to the last point in the original path generated by the Path Shape parameters. So if you want to track the actual path start points you need a path max length of 1.

Partition

This parameter is only associated with the Screen Partition Generator option. You can choose how the screen will be partitioned (2x2, 3x2, etc).

Processing 1

The first of two processing options that can modify the generated region in some way. The modification can be a number of different special effects that range from smoothing the region to adding feathered or ragged edges to water color edge effects to gradient or skeleton effects.

Processing 2

The second of two processing options that can modify the generated region in some way.

Each of the processors can have some additional options. The two specified below are associated with the Advanced Geodesic processing options.

Starts

The number of random starts in the geodesic region processing module. Changing this value determines the spatial frequency or busyness and local scale of the raggedness introduced by the geodesic processing modules.

Geodesic Algorithm

Specifies a specific option for the type of geodesic processing module used. This will change the overall appearance of the geodesic effect.

...

Randomize

Determines how the output of the Path Randomization module is applied to the generated region.

Brush Option

Determines specifics for how the generated region interacts with the Paint Synthesizer brush generation modules. The generated region can replace the entire dynamic brush or it might only replace the dynamic brush alpha, leaving you free to combine region fill as brush effects to determine the overall brush shape and fill from-to blend while still using the Source Brush as a fill type.

For example, if you want to use a movie brush for the source brush with the region determining the shape of the fill then you'd set this to Alpha Only and use a Brush type set to Source Brush Alpha.

Color Start

Specifies a number of options for how the region can be colored. Some of these options will analyze the source image within the region area to determine how to color that area. Others just sample the source image at a single point associated with the region.

Size Option

Allows small regions to be filtered out so they will not be drawn. Very useful to clean up some of the autodraw region fill as brush effects. You can specify no size filtering, or filtering based on the 1D or 2D size of the region.

Minimum

The minimum size below which region filtering will take place and the generated region will not be drawn. .

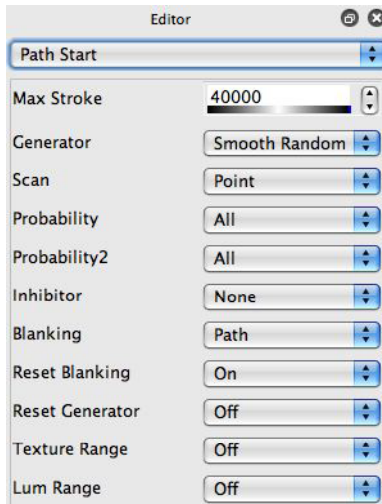
Repeat Option

Normal means this feature is turned off. All of the other options work in conjunction with the Path Application Repeat Stroke control. When any of these additional options are selected, the first stroke is drawn with the normal region fill as brush settings but subsequent repeat strokes use the region outline path and draw like normal interactive pen strokes based on that path.

The DualMode options work with dual Fill Algorithms (Paint Fill Apply) and always use the second fill option for all subsequent repeat strokes that are using the edge outline as a normal paint path.

The options with a 1 at the end will work for all brush types. The preceding options without a 1 at the end work off of the current source brush cache, so they would override something like a geodesic brush type and use the source brush cache instead when drawing the outline paths.

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 algorithmically 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 additional start points based on the initial scan location. 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 settings 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 values.

The individual start points generated by the Path Start process can have temporal continuity in a movie sequence if Time Particles are turned on. See the Time Particles section for more information on how to use Time Particles in animation sequences.

Max Stroke

Determines how many paths will be generated before a paint action stops on it's own. This is a maximum setting. You can always 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 this value is set to a high value so auto painting will continue for a very long time if left unattended. It's assumed that you will manually stop the painting long before this. If you are recording a PAsEq action step, the # of painted strokes actually drawn when you stopped action drawing is what will be recorded in the PAsEq step, not the high value in the initial patch.

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 or it's borders with a regular grid.

Additional parameters may appear depending on which Generator you choose. These additional specific Generator options are explained in more detail in a few pages in the section called Start Generator Options.

The adjacent reset button resets the current generator algorithm. By resetting, you can exactly regenerate a set of scan locations. This is true even for the random settings. The random sequence will reset and playback the same way when the reset button is pressed. You can use Reset in a PAsEq animation if you always want the paint stroke start locations in adjacent frames to be in the same physical locations.

Scan

Determines whether a secondary scan path is followed from the initial starting scan location derived by the generator algorithm. The Point option does not specify an additional secondary scan. Repeat options repeat either the initial start point or the end of the previous paint stroke. The other options generate secondary scan patterns based on stored bezier paths.

ParticlePaint pen mode patches typically need this set to repeat the start location multiple times if you want them to draw in action drawing like they do with a manual pen.

Probability

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

If you are unfamiliar with the term probability, think coin toss. A probability of 50% is like tossing a coin and only doing something if heads comes up.

Probability2

Sets a second probability constraint on whether the current scan point is actually used as a path start location. The first and second probability constraints work together, giving you more control over influencing where path start points are generated.

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.

Beware, you can paint yourself into a corner with this one. If you start off with a white canvas and set this to only use non white start points on the canvas, then the start point generator would never find a start point to use for drawing.

Blanking

Determines how a paint stroke will overwrite the blanking buffer.

The adjacent reset button resets the current blanking buffer.

The Blanking buffer is a hidden frame buffer used internally by Studio Artist as an aid in generating automatic drawing. It can be used for many different purposes internally. Preventing overdrawing as a way to speed up painting an image by stopping stroke drawing when a new stroke bumps into a previously drawn one is one example (Path End Blanking checkbox).

You can always access it by setting the background popup to Blanking, or you can use menu commands under the Canvas main menu that set the current Region Selection to the contents of the Blanking buffer.

Reset Blanking

Turn on if you want the Blanking buffer to be erased prior to action drawing.

Reset Generator

Turn on if you want the internal parameters associated with the Generator to be reset each time it is run. Doing so will lead to an identical set of path start points generated each time action is pressed, which can be useful in some situations when you process a movie or generate an animation.

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 this is turned on.

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 this is turned on.

Note:

Paint Action Sequence Action Steps will record the last number of paint strokes actually drawn onto the canvas with a Paint Patch as opposed to the actual Path Start Max Strokes setting shown in the Path Start control panel. When you playback the Action Step, then the Max Stroke setting will update in the interface to reflect the value actually recorded in the PASEq Action Step.

You need to shift option click a Paint Action Sequence Action keyframe cell in order to overwrite record a new Max Strokes setting. Normal option-click recording will overwrite record all paint Synthesizer values except for the Max Strokes setting. Shift-option-clicking records all settings including the Max Strokes setting.

This distinction allows you to option-click to record a new paint Preset into a specific Paint Action Sequence step while retaining the number of paint strokes originally recorded in the Action Step. Most Presets have the Max Strokes setting at a very high value (40,000) so that a Patch will draw indefinitely until the user manually stops it.

Start Generator Options

Here is some more information on the different Generator options available in the Path Start control panel. All of the various generators output a series of (h,v) coordinates in the current canvas that are used as starting locations for a generated paint stroke.

Random Scan Generators

- Clumpy Random
- Smooth Random 1
- Smooth Random 2
- Smooth Random 3
- Cat Map

All of these output a specific kind of random scan of the canvas with unique visual appearance. Smooth Random 1 is probably the most frequently used start generator.

If you are using dual Fill Algorithms in Paint Fill Apply then there can occasionally be an interaction between the Smooth Random generators and the dual fill algorithm that may sometimes cause the generator to only fill part of the overall canvas rather than the entire canvas. If this occurs you can switch to the Clumpy Random generator to get complete coverage.

Complete Top to Bottom Scans

- Rectangle Grid Scan
- Hexangle Grid Scan

These generators scan the complete canvas in a regular scan pattern. The H-V Grid Spacing edit fields let you choose the spacing in pixels for the scan grid. The H-V Grid Offset edit fields let you specify an initial offset in pixels for the scanning grid.

- Grid Scan - Max Brush
- Grid Scan - Tile Spacing

These generators scan the complete canvas in a regular scan pattern. The grid spacing is either based on the maximum source brush size or the tiling spacing as specified in the Path Application control panel.

- Region Select Active Scan

This option generates start points by continuously scanning the current region selection for active pixels.

Patterned Scan Generators

Golden Spiral

A spiral scan pattern from the center of the canvas based on the golden mean. Useful for generating a sunflower like scan pattern that radiates from the center of the canvas.

Border Clockwise

Random Border

Border Full In Clockwise

Center FullOut Clockwise

Border clockwise scans around the canvas border using the grid spacing and grid offset edit fields to control the spacing and initial offset of the border scan. Border Full In Clockwise continues the clockwise scan spiraling in until it reaches the center of the canvas. Random Border scans to a series of random locations on the canvas border. Center FullOut Clockwise starts in the center and scans clockwise outward based on the grid spacing parameters.

These border scan patterns are very useful for generating border special effects like ragged borders or feather borders, etc.

Last Path End

NScan-Last Path End

Continues a scan from the end of the last drawn path. This generator is useful for simulating the effect of sciatic eye movement or simulating free sketching techniques where the pen never leaves the surface of the canvas.

The NScan option repeats the last drawn path location N times, as specified by the NScan # parameter.

Path Memory 1

Path Memory 2

Path Memory 3

Path Memory 4

Start locations are generated from scanning the internal paths stored in the specified global bezier path memory. The scan spacing used to index through the stored bezier

paths is the Pen Mode Scan Spacing.

Internal Path Memory 1

Start locations are generated from scanning the internal paths stored in the paint synthesizer's internal bezier path memory. The scan spacing used to index through the stored bezier paths is the Pen Mode Scan Spacing.

Start Point Internal Path Memory 1

Start locations are generated from indexing the internal paths stored in the paint synthesizer's internal bezier path memory in order and outputting the individual path's start location only.

This generator is used when you are encapsulating a complete path memory in a single action painting step for paint animation. In a PASEq step you can record multiple keyframes each with a unique internal path memory of bezier paths, so the path start points and path shapes will tween between keyframes in a PASEq animation. You can use the Path : Convert to Paint Synthesizer : as Autodraw Path Memory menu command to do this automatically or you can configure the Paint Synth and internal path memory manually.

Start Point Bezier Collection

Start locations are generated from scanning the internal paths stored in the global Bezier Collection in order and output using the individual path's start location only.

This generator is used when you are encapsulating a complete Bezier Collection in a single action painting step for paint animation. In a PASEq step you can record multiple keyframes each with a unique internal path memory of a Bezier Collection, so the path start points and path shapes will tween between keyframes in a PASEq animation. You can use the Path : Convert to Paint Synthesizer : as Autodraw Bezier Collection menu command to do this automatically or you can configure the Paint Synth and internal path memory manually.

Time Index Internal Path Memory 1

The individual paths stored in the paint synthesizer's internal bezier path memory are used to define a series of motion paths for paint strokes over time in an animation. Individual start points at a given frame time scan through the individual paths in the memory. The frame time is used to determine the offset within the individual paths.

This generator can be used to animate the movement of a collection of paint strokes over time.

Auto Regionization Generators

- Watershed Regionize
- Adaptive Block Regionize
- Color Simplify Regionize
- Cellular Regionize
- Cell Partition Regionize

These generators perform auto-regionization of the source image and will take a few seconds to perform computations before drawing begins. These generators start by regionizing the source image into a series of individual regions.

Watershed tries to follow the contours of the image. The max strokes setting determines the # of start points for the watershed operation (0-254 range). Adaptive Block tries to organize rectangular blocks to represent the image. The max strokes setting determines the complexity of the adaptive block representation (0-254 range). Color Simplify breaks the image up based on its coloring to generate the regions. The max strokes setting determines the # of colors used for the region generation (0-20 range).

Both Cellular and Cell Partition work a little differently than the other regionize options in that decreasing the number of path starts increases the number of generated regions 50-250 would be a good initial range of values to try out. Cellular generates irregular cell regions while cell partition generates overlapping partitions whose structure is influenced by the source image.

A start location is then generated associated with each computed region. You can think

of these generators as scanning an adaptive grid based on the source image.

The Path Start Regionize Path Type option in the Path Shape control panel uses the generated regions to create various hatching or fill paths that will fill in the individual regions. You can think of the regionization process as breaking up the source image into a number of different regions that can then be shaped or filled in with either paint strokes or region fills depending on the other paint synthesizer settings.

Watershed Regionize DM
Adaptive Block Regionize DM
Cellular Regionize DM
Cell Partition RegionizeDM

These are variations on the normal regionize options described above. They act the same except that each region is additionally subdivided into at least 2 sub regions by a smart algorithm so that details of the source image are better represented. The sub regions are drawn separately.

Selection as Regions - All Regions
Selection as Regions - Full On Only
Selection as Regions - All Layers Except Full On

These generators also do a form of auto-regionization. They are based on the current selection image as opposed to the source image. They also assume that the current region selection image has already been regionized to flat luminance regions. This would typically be done by some kind of ip op processing that routes to the current selection, but it could also be based on a manually painted selection image.

The All Regions option assumes the current region selection consists of an image that consists of flat luminance regions. Each flat luminance region is treated as a separate start region.

The Full On Only option only generates start regions for contiguous selection regions that are full on.

The All Layers Except Full On treats any part of the selection not full on as a contiguous region that it generates start regions for.

Flat Region Canvas as Regions

These generators also do a form of auto-regionization. They are based on the current canvas layer image as opposed to the source image. They also assume that the current layer image already consists of flat color regions. Running this options with a continuous tone canvas image would essentially generate a start point for each pixel.

Edge Scan Generators

Edge Scan

This option generates start points at locations that correspond to edges in the source image.

Adj Edge Scan

This option generates start points at locations that correspond adjacent to edges in the source image. Think of this as getting a start point on each side of an edge instead of on the edge itself.

Skeleton Edge Scan

This option generates start points at locations that correspond skeleton paths generated off of edges in the source image. You can think of the skeleton as the path that is equal-distant between any 2 paths.

Sketch to Internal Path Memory1

This option generates start points at locations that correspond to an edge sketch generated from the source image. A sketch algorithm similar to the Sketch Image Operation is used for this generator. There are 2 additional parameters associated with this generator. Sketch Iter determines the number of iterations used to create the sketch. Making it smaller leads to a simpler sketch. Sketch Edge determines the specific kind of sketch generated.

Additional Scan Generators

MSG Scan

This option generates start points using the current MSG preset. You need to choose a MSG preset that has the capability to output scan points from an algorithmic scan generator. At the time of this manual writing these typically consist of the attractor generators. This MSG processor also needs to be the first processor in the MSG preset's processor chain. Consult the MSG documentation for more information on which MSG presets can be used to generate algorithmic scan patterns.

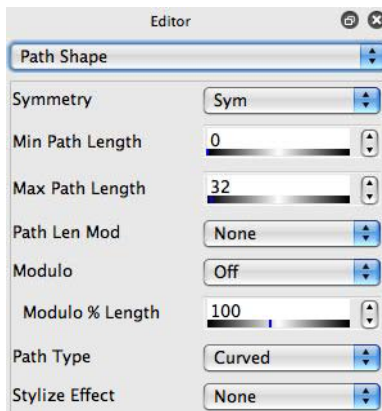
This option can be used to create interesting artistic attractor images where each attractor point is rendered with the current brush nib, or used as the start point for a complete paint path.

Pen Position Live Track
Pen Position Live Track MP

The start point will track the current pen position. The tracking will occur as long as the Wacom pen is in proximity to the tablet, so this allows you to use a pen to interactively determine start points while action drawing is taking place. Useful for live performance situations or where you want to control where path starts take place interactively.

The MP option allows for multiple start point to be inserted. If the shift key is pressed when the pen comes into proximity then a new tracking point is added. Otherwise the oldest tracking point is moved to the new pen position while the other tracking points stay at their original positions.

Path Shape



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

Each path is generated by a specified Path Type algorithm, which is controlled by a specified Path Angle generator and various Path Angle modulators. The Path Angle settings have moved to their own control panel in version 3. The path length can also be modulated within an overall range of lengths. Certain path generation algorithms, such as those based on Bezier path memories or Path Load computational path generators, may offer additional types of modulation control.

Paths can radiate from the start point, or be grown symmetrically from the start point. Path symmetry can be modulated by tilt for certain airbrush or directional effect.

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.

Tilt-Symmetric allows for an interactive continuous variation between a symmetric and non-symmetric path based on the tilt of the drawing pen.

Min Path Length
Max 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 (i.e.. the source of the modulation). You can use the PathLenMod parameter discussed below when you have turned on Path Length Modulation to determine the range of length modulation and whether you want to filter out small modulated path lengths below the min length setting.

PathLenMod Range

If set to Min-Max, then the resulting modulated path length will modulate between the max and min lengths. If set to Full, then the resulting path length will modulate between 0 and max length. This Full range modulation means that any modulated path lengths below the Min Length parameter setting will not be drawn. This is useful if you want to skip any short paths and only draw paths if they have a certain length.

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. If the Modulo checkbox is on, then the path length modulation cycles (think barbershop pole).

Modulo

Path length modulation repeats or cycles with a cycle length equal to the modulation path length setting along the complete path if modulo is on.

% Length

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

Again, if you are unfamiliar with the term modulo just think of the visual appearance of a barbershop pole, which is what you will get for path length modulation if modulo is turned on.

Path Type

Determines the overall path generation algorithm, which means it directly controls what the path will look like. The specific options are described in more detail following the complete pane parameter descriptions in the section titled Path Shape Type Options.

This is the single most important parameter on this control panel, since it determines what the overall path shape will look like. If you only memorize one parameter on this control panel, let it be this one.

Based on the particular Path Type setting, there may be additional editable parameters that appear on sub panels associated with the particular Type setting. These are discussed below.

Directionality

Increasing makes the path shape less directional, decreasing makes the shape more directional.

Directional means long and thin, non-directional means more like a square or a circle.

Bezier Path Shapes

A number of Path Type settings use the contents of Bezier Path memories. These can either be the 4 global Bezier Path memories, or the Internal Bezier Path Memory located directly in the Path Shape control panel.

The contents of the global path memories are stored in a Workspace, but not in an individual paint patch preset file. So, you would typically want to avoid the global path memory settings for normal preset building purposes and use the Internal Path Memory settings for your presets.

Path types that are based on Bezier Path memories have the following additional controls:

Length Mod

Options that determine how Bezier Source paths are specifically modulated by the Path Mod modulator. You can modulate the individual bezier path lengths, the number of paths drawn out of the complete set stored in the path memory, or the scaling of the complete set of paths.

Cycle Type

Determines how the cycle count advances for Cycle Internal Path Memory and Cycle Interp Internal Path Memory path shapes.

Interp Dur

Determines the duration of the interpolation cycle for Cycle Interp Internal Path Memory path shape.

Assume you are using StrokeCt as your Cycle Type and you have 3 bezier paths in the internal path memory. With a Interp Dur of 10, then it would take 10 paint strokes to interpolate from 1 bezier path to the next one. The duration is in relationship to whatever cycle type you are using to advance the cycle through the bezier paths.

Regionize Path Shapes

There are a number of different path types that will internally generate a region using some intelligent algorithm and then try to fill it in with a path. The region could grow from the start point based on the Source Image color values, it could use the current RegionDraw pen mode setting, or it could be associated with one of the Path Start regionize scan algorithms.

Path types that generate path shapes to fill a region have the following additional controls:

Reg Path

Specific path generation algorithm used to fill the internally computed region. They all look different, try them and see.

Spacing

Spacing in pixels used for placing adjacent paths in the region fill path generation algorithm.

Path Load Path Shapes

The Path Load Path Type allows access to a wide range of computational path generation algorithms that are automatically generated as you draw and then loaded into the current auto-drawing path. The generated overall path may not be contiguous, but might be composed of a number of non-contiguous subpaths. This is analogous to the Brush Load capabilities elsewhere in the Paint Synthesizer, except that we're loading a generated set of paths as opposed to a brush image.

Path Loading can generate sets of paths that represent anything from simple shapes to random scribbles to very complex fractal L-system plant forms or fractal chaotic attractors.

Load Type

Determines the specific path load generator used. There are a large number of different Path Load types and they all look different. Some can generate fractal or plant-like paths. Others are useful for generating specific shapes or hatching or scribble effects. The MSG Attractor is similar to the MSG Attractor Path Start Generator, except that the current MSG preset can be used to generate the path shape (as opposed to the path start positions). Last Path Start LineTo is useful if you want to draw a straight line from the previous path start to the current path start position.

PathLoad Angle Option

Determines how the path angle is internally computed for a Path Load path.

Path Load types that generate path shape based on a path loading fractal Growth or Random Hatch algorithm can have the following additional controls:

Num

Number of sub paths or filaments in the overall path.

Theta

Specific parameter used in the path load generation algorithm.

Alpha

Specific parameter used in the path load generation algorithm.

Len Var

Sub path length variability in percent.

ThetaMod

Interactive modulation option for the theta parameter.

You might need to decrease or otherwise adjust the Path length slider for some of the path load path type options to get the best results.

The best way to understand what the various Path Load parameters do is the try adjusting them and see how the overall appearance of the generated paths used for drawing changes.

Stylize Effect

After a path is generated, it can be modified by a specified stylization effect. The effect will modified the appearance of the generated path.

Path Shape Type Options

Here is some more information on the different Type options available in the Path Shape control panel. These options define different path algorithms that are used in conjunction with the output of the Path Angle control panel to generate the dynamic path shapes used for action drawing. Some of these may have additional parameters that appear in the control panel when you select them.

Line

Draws a straight line. Only the beginning path angle value is used to compute the angular orientation of the straight line path.

Curved

Draws a curved path based on the dynamic output of the Path Angle control panel. This is the most common path type used in presets and it draws normal curved paint strokes.

- Circle
- Spiral
- Ellipse
- Spiral Ellipse
- Triangle
- Rectangle
- Spiral 1
- Spiral 1 Ellipse
- Spiral Flip

All of these draw geometric shapes. The output of the Path Angle control panel will determine the angular orientation of the shape and any angle modulation may distort it.

- Path Memory 1
- Path Memory 2
- Path Memory 3
- Path Memory 4

Draws a series of paths based on the contents of the specified global bezier path memory. The Rnd options output from a randomly chosen path from the memory. Otherwise all of the paths are used.

Internal Path Memory 1
Rnd Internal Path Memory 1
Cycle Internal Path Memory 1
Cycle Interp Internal Path Memory 1

Draws a series of paths based on the contents of the paint synthesizer's internal bezier path memory. The Rnd options output from a randomly chosen path from the memory. The cycle option uses a different internal path for each complete action painting step, and then moves to the next path in the internal memory for the next action painting step. Otherwise all of the paths are used in an action painting step.

Cycle Interp is like the cycle option except you can interpolate between the individual bezier paths over a specific number of steps (the Interp Dur parameter). Cycle type determines whether the interpolation occurs in real time as the strokes are drawn or if it's tied to frame animation.

You are better off using the internal path memory path types for your presets, since the contents of the internal path memory are stored in a paint preset while the contents of the global memories are not.

2 Stroke Line

Draws a straight line that moves back and forth. Only the beginning path angle value is used to compute the angular orientation of the straight line path.

Path Load

Path loading is analogous to brush loading, except that a complete set of multiple paths are generated on the fly as opposed to a complete brush image being generated on the fly while painting. The Load Type parameter lets you choose what type of path loading will be used. Some of these types don't have any additional controls. Others may bring up sub panels with additional parameters.

Bezier Collection
Cycle Bezier Collection

Draws a series of paths based on the contents of the global Bezier Collection. Functionality mirrors the global path memory and internal path memory functionality.

Currently unsupported in v4.

Grow Region from Start Point

Dynamically grows a watershed region based on the source image contours and the current start point. This computation can take a few seconds. Different options are available for how the generated path then tries to fill in the dynamically computed region.

Use RegionDraw Pen Generator

Uses the current RegionDraw Mode Fill Type (located on the Pen Mode control panel) to dynamically generate a path that fills a local region centered on the current start point.

Path Start Regionize

Used with the Watershed Regionize and the Adaptive Block Regionize Path Start Generator options. These start generators already regionized the source image when the start point was computed. Different options are available for how the generated path then tries to fill in the dynamically computed regions.

Grow Region from Start Point Use Regiondraw Pen Gen

Dynamically grows a watershed region based on the source image contours and the current start point. This computation can take a few seconds. Then uses the current RegionDraw Mode Fill Type (located on the Pen Mode control panel) to dynamically generate a path that fills the dynamic region.

PathStart Regionize Use Regiondraw Pen Gen

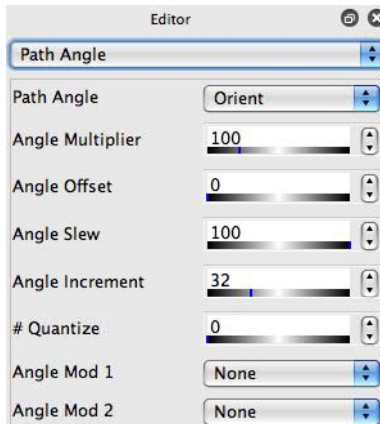
Used with the Watershed Regionize and the Adaptive Block Regionize Path Start Generator options. These start generators already regionized the source image when the start point was computed. Uses the current RegionDraw Mode Fill Type (located on the Pen Mode control panel) to dynamically generate a path that fills the dynamic region associated with the start point.

Live Extension

This new path shape is dynamically grown by adding the new path coordinates to the

previous contents of the last path buffer. When used with manual drawing based on autodraw interactive pen mode and path randomization settings this allows a dynamic path shape to be generated that can act like a string of connected particles with swarming interactions or spring forces or gravity effects.

Path Angle



The parameters on this pane determine how the local path angle is computed when a path is automatically being generated. The interaction of the computed local path angle and the specified Path Type in the Path Shape control panel will determine the resulting appearance of the final computed path shape used for Action drawing.

The initial computed path angle can be subsequently modulated by up to 2 different interactive or automatic angle modulators. This angle modulation is occurring prior to actual generation of the path (as opposed to the Path Randomization parameters which randomize the path after it is initially generated).

Path Angle

Determines the source of the angle information used in the path generation algorithm. Some of these setting are based on perceptual visual attributes associated with the Source Image. Some are computational and are used to generate hatching patterns. Some are interactive like pen Stroke Angle or Tilt Orientation

Additional parameters detailed below which are associated with the computation of the local path angle as the overall path shape is computed can influence the overall appearance of the final generated path:

Angle Multiplier

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

Angle Offset

Fixed offset added to the computed 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 Increment

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.

The most accurate path would be a setting of 1. However, by making this larger you can often create more interesting visual effects as well as break up what can sometimes be a rubbery or overly curvy appearance associated with tight orientation tracking.

Quantize

This is inactive if set to 0. Otherwise the angle is quantized to the specified number of angles. So if you set it to 3, then you'd only have 3 different angles that could be generated (0, 120, 240 degrees)

An angle modulation generator can be used to increase the complexity of the resulting local angle and resulting path shape appearance. Two different angle modulation

generators can be used at the same time for more creative control and increased effect complexity. There are several different controls associated with each angle modulation generator detailed below. The overall controls in the 2 modulators are the same.

Angle Mod 1
Angle Mod 2

Specifies a specific modulation generator that modulates the current path angle. There are 2 different modulators 1 and 2. They all look different, try them and see.

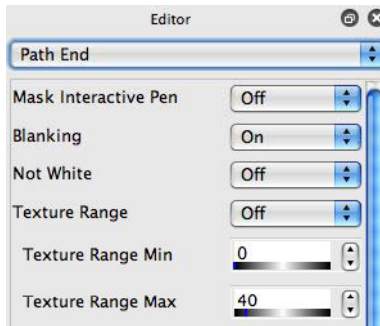
Mod Inc

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

Mod %

The maximum percentage of displacement applied to the current path angle. Any displacement modulation will be from zero to this maximum setting. No modulation occurs if it's set to 0.

Path End



Auto-generated paths have a start point, a shape, and an end. The parameters on this pane are used to specify possible conditions that will terminate or end the generation of a autodrawn path. This termination will be prior to the normal modulated path length specified in the Path Shape control pane.

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. This can be thought of as dropping out the paint in the masked areas rather than terminating the path.

Possible conditions for path termination or masking can include visual attributes derived from the Source Image, from the Canvas, or from internal variable associated with the Path Shape generator such as angular variation.

Different parameter combinations in this control panel can have a significant effect on the overall appearance of the automatically painted image. This can range from speeding up drawing (by not redrawing where you have already drawn) to only drawing the edges for sketch effects to controlling the tightness or legibility of a drawing.

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.

If this setting is turned off, then the Path End parameters are ignored when manually drawing. By manual drawing we don't mean manually using a pen in any of the autodraw pen modes, since the drawing is automatic in these modes. Manual drawing means pen modes like interactive pen.

Blanking

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

The Blanking buffer is a hidden buffer used internally in the Paint Synthesizer. Here it is being used to keep track of where you have previously drawn, based on settings in the Path Start control panel that determine how it is filled in. The entire brush nib could fill in the blanking buffer, or only the path used for drawing, or drawing might not affect the Blanking at all but it could have been set by some other part of Studio Artist for a special effect.

Not White

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

Note that this could be a problem if your canvas is black. Don't paint yourself in a corner.

Texture Range

Specifies a minimum and maximum range of values that the current path location must be within if turned on.

Higher range values mean stronger texture energy, or places in the image where edges and detail are the most noticeable.

Path Diverge

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

angular orientation. The value used is what you choose. It is computed when the path starts, and then as the path is being drawn if the newly computed value exceeds the Diverge Value parameter then the path is terminated.

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 turned on. This parameter assumes you are trying to draw the Source image and the calculations are based on analyzing the source image as you draw.

Use this to increase the legibility or tightness of a painting by restricting the paint path to only draw in areas of the canvas that should match the color you are drawing with.

Luminance Range

Specifies a source image luminance range that the current path location must be within if turned on. Insures that a path will only be generated within the specified image area.

Useful if you only want to draw in areas of the canvas that correspond to the dark or light parts of the source image.

Angle Threshold

If the current path angle changes while the path is being generated by more than this amount and this is turned on, terminate the path. Ensures that a generated path will have the specified angular smoothness.

Useful to get rid of kinky paths that don't really go anywhere. If you are a scientific type you would call these saddle points in the orientation manifold but then you probably aren't the scientific type, so think of them as the kinky paths that scribble in one position that you would like to get rid of. Increasing the Angle Increment slider in the Path Angle control panel is another approach to cleaning up kinky paths naughty behavior.

BackTex Threshold

Threshold the output of the current background texture, and terminates the path if the threshold value is exceeded.

Wrap Path at Edge

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

This can be really useful for pattern design for fabric printing.

Select Region Path Stop

Terminate current path if it leaves the current active selection region.

Use this if you only want the paint to draw in the current selection area.

Local Region Path Stop

Terminate current path if it leaves the current unique selection region. There can be 256 unique current selection regions, one for each unique graylevel in the 8 bit current selection region image.

This assumes you have setup the current region selection image to consist of unique grayscale regions. The Path Start generator setting called Regionize will do this for you automatically, and you would typically use this setting associated with that path start generator.

Force Path Length

Terminate current path if it exceeds the maximum path length specified in Path Shape.

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.

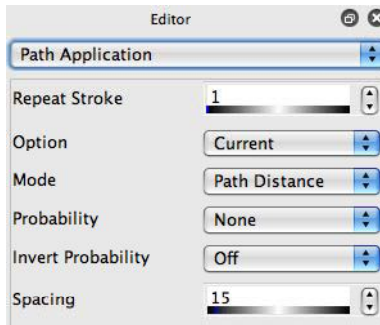
Used in presets that intelligently limit drawing like some of the black and white autosketch presets. These presets inhibit drawing in a paint stroke if they determine

you will draw too much if the stroke continues.

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. This includes the spacing of brush dabs of paint along the path as well as how a brush dab of paint is applied to the Canvas in relation to the path.

The initial path can be modulated by up to 2 different random displacement algorithms. The Path Randomization settings now have their own control panel in version 3.

A path 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.

Displacement and constraint effects can be combined together to generate a virtual paint brush that is composed of a number of smaller sub-brush elements based on Studio Artist's normal Brush controls. This is one approach to designing a responsive paint tool that appears to have a large interactive brush without using large Source Brush sizes.

Repeat Stroke

How many times the path should be repeated to generate a paint stroke. If you are drawing manually, then the repeats happen after you finish drawing a complete stroke.

The Repeat Stroke Index modulator is used throughout the paint synthesizer, and allows you to modulate based on repeating strokes. This can be useful for a wide range of artistic effects.

Region as Brush Mode control panel has a Repeat Option parameter that allows for repeats > 1 to draw the edge of a region as opposed to filling it. So the initial stroke is the normal region fill as brush solid region and subsequent repeats of the stroke draw the region outline as a normal path. This could be used as a way to create watercolor presets with wet edge effects.

Vector Output control panel offers a 'Vector - Raster Repeat' main render option that will use the Vector (solid color) render option for the original stroke and then revert to the normal Raster render option for subsequent repeats.

Option

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

The text point size is different than the actual size of the brush image for a text brush since the brush needs to be large enough to hold any entirely rendered letter form.

Mode

Specific spacing computation algorithm. Some are based on the drawn path and others will force your drawing to conform to a spatial tiling grid, which is nice for generating tiling effects.

The tiling options are nice for special effects where you want the brush nibs to tile on the canvas rather than specify track a paint stroke. The tile offset controls let you adjust the overall spatial offset of the tiling.

Probability

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.

Invert Probability

Inverts the specified probability calculation if turned on.

Spacing %

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

Increasing the spacing % in Path Application is the easiest way to make a given paint preset draw faster.

H Tile Offset%

Horizontal start offset for the Path Application mode parameter tiling options.

V Tile Offset%

Vertical start offset for the Path Application mode parameter tiling options.

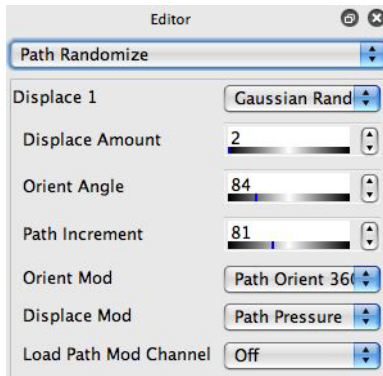
Interpolate Path

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

Path Tracking

Determines the internal algorithm used to track the pen or mouse path over time. Previous versions of Studio Artist used linear tracking. The other options can allow for a smoother path when drawing extremely fast.

Path Randomize



Path randomization can be used to create a sketchy or hand drawn look from auto generated paths. Some randomization settings are specifically designed to simulate pen tilt modulated airbrush or blown splatter paint effects. They can also be used to simulate Pollack style drip paint effects and other wild or subtle stylistic effects.

Random displacement and path application constraint effects can be combined together to generate a virtual paint brush that is composed of a number of smaller sub-brush elements based on Studio Artist's normal Brush controls. The small source brush elements work together along with the randomization settings to generate the perceived appearance of a larger cloud of paint. This is one approach to designing a responsive paint tool that appears to a user to have a large interactive brush without using large Source Brush sizes with computationally demanding internal dynamic textures.

The initial path can be modulated by up to 2 different random displacement algorithms. Random displacement can be modulated by a number of interactive controls or automatically by image visual attributes.

Each of the 2 random displacement modulators has identical controls that are detailed

below.

Displace 1

What kind of displacement algorithm if any is applied to the path. They all look different, try them and see.

Displace Amount

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

Increasing this setting makes the path more wiggly, decreasing it makes the effect more subtle.

Orient Angle

The angular orientation of the path displacement. You can use this so the randomization tracks the path angle as you draw, or for other interactive or special effects.

Path Increment

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

Orient Mod

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

Use a setting of 90 degrees if you want the displacement to be perpendicular to the path angle while you are drawing.

Displace Mod

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

Load Path Mod Channel

Allows the specified path modulation channel to be replaced or overridden with the randomized displace modulation signal.

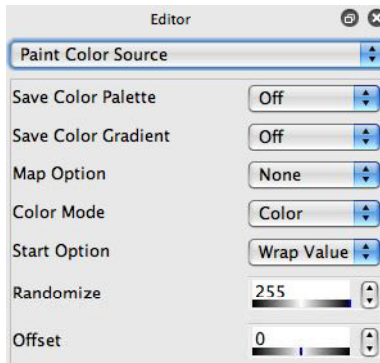
Turb Level

of octaves of turbulence. Only available for Displace options based on a turbulence algorithm.

Turb Alg

The specific turbulence algorithm used. Only available for Displace options based on a turbulence algorithm.

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.

For example, if the user has specified a fixed source color, then the current fixed 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 transformed paint color is then randomized. It is then passed to a recursive blending operation. It then is used as the input to the Paint Color Modulate module.

Save Color Palette
Save Color Gradient

Saves the current Source Color Palette or Color Gradient settings with the Paint Patch or Preset if checked.

Map Option

Specifies a color mapping option. If the option is on, it will map the initial source color value to the specified setting prior to subsequent processing in this module.

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.

There is a lot of color theory as well as intelligent color mixing techniques that painters use buried in here. You can automatically generate opponent or analogous color mixing as well as auto-generate Pointillist effects.

The initial paint color may then be algorithmically randomized.

Start Option

Determines how the initial paint color is randomized and offset.

These options determine how the color will be randomized as well as what happens at range boundaries in the color space chosen.

Clip means if the randomized value exceed a range boundary it is hard clipped to that boundary. Wrap means that if the randomized value exceeds a range boundary it reverses direction at the range boundary. Cycle means the randomized value gets mapped in a modulo or barber shop pole style at range values.

Lum means the color luminance is randomized, Hue means the color hue is randomized, Sat means the color saturation is randomized, RGB means the 3 RGB components of the color are all randomized, opponent means the color is randomly mixed with its opponent color (located on the opposite side of a 360 degree hue color wheel), analogous means the color is randomly mixed with its adjacent analogous color (located next to it on the hue wheel).

Randomize

Determines the amount of initial color randomization.

Larger values lead to more randomization, smaller values lead to a subtler effect. Set it to 0 if you don't want any color randomization to change your carefully hand entered spot color value.

Offset

Determines the amount of initial color offset.

Negative values make the color increasingly darker, positive values make the color increasingly lighter.

The initial paint color may be recursively blended with another color source as the brush proceeds along the application path. These settings determine whether the paint brush drags its initial start color across the Canvas, or adaptively updates its color clones the Source colors based on its current position.

Recursive blending means that the initial color is mixing with some other color source as you draw. You can use this control to simulate the dirty brush effect of the brush picking up existing coloring from the canvas. Or, you can use this control to specify a brush that clones from the source as opposed to the normal behavior of dragging the initial source color.

Recursive Source Blend %

This value determines the initial source blend percentage. A setting of 100% means that the initial color will drag as the pen is moved with no recursive blending taking place. A setting less than 100% specifies a recursive mix of the existing paint color with a new paint color derived from the Blend To setting below.

This setting is very sensitive at the high end (close to 100%).

RSB Start

The start color source to the recursive blend algorithm.

RSB Blend

The second blend color source for the recursive blend algorithm.

The second blend coloring is what is repeatedly mixed into the brush as the pen moves. Setting this to the Source image is how you specify a cloning brush. Setting this to the Canvas image is how you specify a dirty brush that picks up coloring from the canvas.

RSB Modulation

Specifies a modulator for the recursive source blend. Setting the modulator to none means the recursive source is full on.

There are macro edits available in the Edit: Paint Synthesizer: Macro Edit menu that provide an easy way to quickly adjust the recursive blend setting to clone the source color or drag the source color without having to manually set the various controls in this control panel.

Force Color to Path Memory

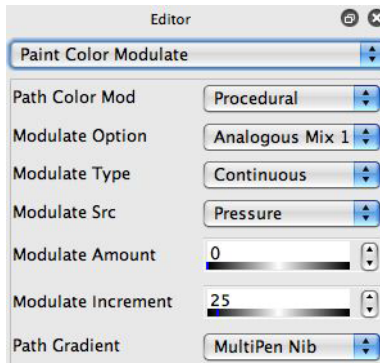
If turned on the normal color controls are overridden and the path color is set to the color stored in the path memory. This would typically be used if you are drawing from paths stored in the bezier path memories. This should also be turned on if you are auto-regionizing and want to use the color associated with the auto generated region (which could be very different than the initial start point of the path if regionize path shape options are in use).

AutoGen Source Palette

Normally you would leave this turned off since it's a specialty function. When turned on, the source color palette is auto generated from the current paint color generated by the various Paint Color Source control settings. So the source color palette will be regenerated for each paint stroke. This can be useful for certain kinds of generative PASEqs, where you use one paint action step with a single paint stroke to auto generate a color palette based off of a color derived from the spatial positioning of the paint stroke relative to the source image. Subsequent paint action steps in the PASEq could then work off of the source random palette settings to work with the generated palette

colors.

Paint Color Modulate



Additional paint color modulation options can be specified in this control panel. These modulations occur dynamically as the path is drawn. The input to this module is the output of the Paint Color Source module.

The Paint Color Source output color is first passed through a path color randomizer. The output of the path color randomizer is then possibly gradient modulated. Both of these randomizers can be interactively modulated. Or, they can be procedurally modulated with oscillators.

The color output of this pane is used as a possible paint color 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.

Subtle usage of the various paint color modulation options can help impart a more organic feel to your paintings. Moderate settings can be used to incorporate techniques from color mixing theory directly into your painting automatically while you work. Extreme settings can be used to auto-generate a large range of stylistic effects such as auto impressionist or pointillist effects.

Path Color Mod

Determines the randomization algorithm for the color modulation as the path is traversed.

Modulate Option

Determines how the path color is randomized as the path is traversed.

These options determine how the color will be randomized as well as what happens at range boundaries in the color space chosen.

Modulate Type

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

Typically you would use the Continuous setting for smooth randomization.

Modulate Source

Additional interactive modulation source option lets you choose a specific modulator to adjust the overall color path modulation effect.

Allows an interactive modulator or perceptual visual attribute to modulate the randomization effect for more organic feel.

Modulate Amount

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

Larger values lead to more randomization, smaller values lead to a subtler effect. Set it to 0 if you don't want any color randomization to change your carefully hand entered spot color value.

Modulate Increment

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

Increasing means the random cycle will occur over a greater path length. Decreasing means the random cycle will occur more quickly over path length, which can also make the effect seem more noisy as opposed to being perceived as a smooth variation.

The path color gradient modulator is the second color modulator on this control panel. Rather than a random modulator, it allows a gradient mixing between the source color (which may have been random modulated with the settings described above) and another color source, which is called the gradient end.

The Multipen Nib modulation option is very effective for creating color gradient effects in multipen patches.

Path Gradient

Turns it on and determines the specific path color gradient modulator if it is on. This specifies a gradient color shift that takes place as a function of the particular specified modulator's value along the path.

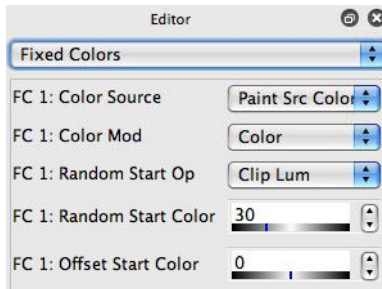
Gradient End

Specifies the source of the second color the path gradient algorithm modulates to.

Gradient Strength

Specifies the strength of the path gradient color transformation in percent. Decreasing the strength decreases the color modulation and allows for more subtle coloring effects.

Fixed Colors



The actual paint applied to the canvas can be constructed from various combinations of the output of the Paint Color Source/Paint Color Modulate modules and two additional 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 tracking can just follow the initial start color for the path or it can track the associated color modulations that may occur along the path. The tracking Fixed Colors can also be themselves randomized or subjected to color transformations.

The use of the two Fixed Color generators along with the output of the Paint Color Source and Color Modulate modules allows for three possible interactive color sources for use in constructing dynamic paint textures within Studio Artist. The combination of these three dynamic color sources allows for the generation of rich, expressive, textured paint with many subtle visual looks or special effects.

Each Fixed Color is determined by the following parameters:

Color Source

Specifies whether the fixed color is a static color associated with the associated

square color memory, tracks the initial Paint Color Source start value for a path, or continuously tracks the current Paint Color as it modulates on the path.

The color square memory for the static color will appear if you choose that option. As with all memory buttons, you option click to record, click to playback.

Color Mode

Specifies a possible transformation of the initial fixed color value.

A number of these allow you to access some sophisticated color theory and color mixing painting techniques.

Random Start Option

Determines how the initial paint color is randomized and offset.

These options determine how the color will be randomized as well as what happens at range boundaries in the color space chosen.

Random Start Color

Determines the amount of color randomization.

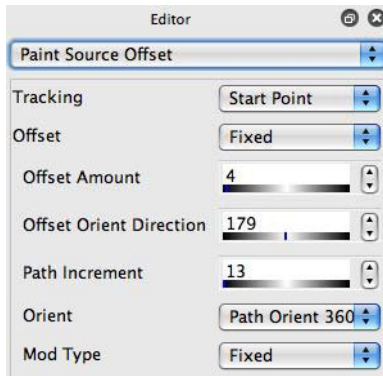
Larger values lead to more randomization, smaller values lead to a subtler effect. Set it to 0 if you don't want any color randomization to change your carefully hand entered spot color value.

Offset Start Color

Determines the amount of color offset.

Negative values make the color increasingly darker, positive values make the color increasingly lighter.

Paint Source Offset



The parameters in this pane can be used to offset the physical location of the current paint source in relation to the pen positioning. 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.

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 directly into the source control panel settings in a future version of Studio Artist).*

StartPoint - subsequent locations along the path track off of the initial path start point. This is the normal mode for painting.

Fixed - subsequent locations are always a fixed coordinate location. Set this location

initially 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 was initially located on the canvas when you started drawing the stroke.

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

Time Particle Start Point - subsequent locations along the path track off of the original Time Particle start point from frame 1. This can be used to generate shatter effects over time.

These controls mirror the functionality of the Path Randomization control panel parameters. Internally a randomization module identical to one of the Path Randomization modules is used to compute the randomized source offset.

Offset

Determines the specific 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.

Turb Level

of octaves of turbulence. Only available for Offsets based on a turbulence algorithm.

Turb Alg

The specific turbulence algorithm used. Only available for Offsets based on a turbulence algorithm.

Random generator #2 is an additional simple randomizer. This is typically used to break up line artifacts associated with displacement painting fill algorithms.

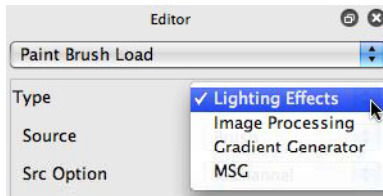
Gen 2

Specifies a second algorithmic random generator whose signal is added to the overall Offset signal.

Gen 2 Amt

The maximum amplitude of random generator #2.

Paint Brush Load



Rather than loading a paint brush with just a solid color, this module allows a dynamic paint image to be loaded into the dynamic brush. The dynamically generated paint image can incorporate effects generated over the entire area of the brush.

The dynamic Paint Brush Load image is repeatedly computed behind the scenes as you draw. Brush Loading allows for 3D paint effects as well as for the creation of wild paint effects and sophisticated image processing effects created directly in the Paint Synthesizer.

Type

Specifies a specific Brush Load type. This changes the overall brush Load effect.

There are several different types of master brush loading algorithms. They are Lighting Effects, Image Processing Effects, Gradient Generators, and MSG.

Lighting effects allow for lush three-dimensional lighting effects that can simulate thick paint strokes, surface texture, or palette brush on canvas techniques.

Image processing is an extremely powerful brush load type that allows you to load up to 2 different serially chained image processing algorithms into a paint brush and paint with them in real time.

Gradient brush loading allows an alternative approach to generating a computational brush gradient for 3D lighting, shading, or other special effects.

MSG brush loading allows you to utilize the unlimited power of the MSG preset-based plug-in architecture to infinitely customize or extend the paint synthesizer.

MSG stands for modular synthesized graphics. MSG presets can either be texture generators or image processing effects and are based on an internal set of editable modular processors chained together into one overall preset.

By using this Brush Load option you can effectively infinitely extend the paint rendering power of the paint synthesizer by building custom MSG presets that you can then interactively paint with.

Brush Load Lighting Effects

The dynamically generated paint image incorporates paint lighting effects computed over the area of the current dynamic brush. A source for a lighting calculation is chosen. Specular reflection lighting models allow for the simulation of different lighted material properties as well as special effects. The result of the chosen lighting operation can then be used in several different ways to generate a loaded paint brush.

Source

Specifies a source that is used as the input to a lighting calculation. This can be a procedural texture generator integral to this module or an output from another paint synthesizer module. Some sources are a combination of two different signals.

You can choose to feedback the canvas through the lighting effect. This allows the creation of dynamic visual chaos or Turing style reaction diffusion for the technically inclined, or wild looking paint textures for the technically uninclined.

Source Option

Specifies a specific image channel option for the monochrome source used in the lighting calculation.

Lighting

The kind of lighting calculation performed on the load source specified above.

Apply

What is done with the results of the lighting calculation to generate a loaded paint brush. They all look different, try them and see.

Angle

Angular orientation of the lighting source. Think of this as where the lighting is coming from in a 360 degree orientation around the center of the canvas.

Elevation

Elevation of the lighting source. 90 degrees means the lighting source is straight overhead. Decreasing this value moves the lighting source downwards closer to the canvas. The shadows get longer as the elevation decreases.

Width

Width of the overall lighting effect.

Specularity

Specularity constant for the surface lighting model used internally. Adjusting this value allows for the simulation of different surface materials that scatter light in different ways.

A value of 0 turns it off. Otherwise low values mean a lot of specularity, with the effect decreasing as the parameter increases.

Angle Mod

Modulation option for the lighting angle.

Elev Mod

Modulation option for the lighting angle.

Width Mod

Modulation option for the lighting width.

Brush Load Procedural Texture Generator

There are a number of parameters associated with the brush load procedural texture generator. This is a unique procedural texture generator located in the brush load computational module. These parameters come up if you choose a source option that uses the procedural texture. The same parameters are available for all the brush load types that utilize the internal brush load procedural texture generator.

PRnd Scale

Scaling factor for the brush load procedural texture generator.

Increasing the value makes the texture rougher, decreasing the value make the texture finer.

Noise Type

This unlabeled popup lets you select the overall procedural noise generator type.

Changing it changes the overall way the texture looks.

Levels

of turbulence octaves for the brush load procedural texture generator.

Adding more levels increases the overall fractal complexity of the texture at the price of taking more time to generate it and slowing down drawing.

Algorithm

Specific sub algorithm for the specified overall procedural noise generator type.

For a given noise type this allows you to customize the final look of the texture. Try them and see how the appearance of the texture changes.

Brush Load Image Processing

The dynamically generated paint load image incorporates dynamic image processing effects over the area of the current dynamic brush. A source for the image processing operation is chosen. Some Source settings are a combination of two different sources added together.

The result of serially processing the chosen source image through up to 2 different chosen image processing algorithms is then used to generate a loaded paint brush. This is an extremely powerful module. There are a large number of dynamic image processing algorithms that can be interactively controlled while you paint. Or, this module can be used with Action painting and Path Start scan options to design custom automatic image processing algorithms as an alternative to the Image Operations Mode processing algorithms.

Source

Specifies a source that is used as the input to an image processing calculation. The Source can be a combination of several different signals.

Invert Source

Inverts the specified source if turned on.

Algorithm

Specifies the specific first image processing algorithm used to generate the brush load sub image. There are a large number of different image processing algorithms available to choose from and they all look different. Try them out to see the range of different effects possible.

Depending on which specific image processing algorithm is chosen, there may be additional parameters available specific to that particular algorithm.

Size

Specifies the size of the local kernel used in the image processing operation.

Angle Mod

Specifies an angle orientation modulation option for the local kernel used in the image processing operation.

Angle

Specifies a fixed angle offset for the angular orientation of the local kernel used in the image processing operation.

Mod Type

Specifies an additional modulation option.

Algorithm 2

Specifies a second specific image processing algorithm used to generate the brush load sub image. The output of the first chosen algorithm is used as the source for the second algorithm processing.

Some source settings that use the brush load procedural texture will also bring up some additional procedural texture parameters. These were documented in the brush load lighting section and you can go there for specific information on those parameters.

Brush Load Gradient Generator

The dynamically generated paint image incorporates dynamic gradient effects generated over the area of the current dynamic brush. A specific gradient generation algorithm is chosen. The result of the chosen gradient generation algorithm is then used to generate a loaded paint brush.

This module can be used as an alternative for 3D paint effects or as a way to generate interesting color gradient textures in paint strokes.

Algorithm

Specifies the specific gradient generator algorithm used to generate the brush load sub image. They all look different, try them out to see for yourself.

Angle Mod

Specifies an angle orientation modulation option for the gradient generator algorithm.

Angle

Specifies a fixed angle offset for the angular orientation of the gradient generator algorithm.

Brush Load MSG

This brush load option uses the current MSG preset to generate the dynamic brush load image while you paint. This option allows you to use the power of MSG presets to infinitely customize or extend the capabilities of the Studio Artist Paint Synthesizer.

The six user sliders in the main MSG operation panel will influence and control the overall MSG preset effect used in painting with MSG presets. In addition, there are a number of parameters specific to the MSG brush load option detailed below:

Source

Specifies the source for the MSG processing. Like all of the brush load source popups, some of the source options may be a combination of two different sources.

Invert Source

Turn on to invert the specified MSG source before MSG processing.

Gradient Map

Specifies how the internal MSG color gradient # 1 can be adjusted or recomputed while drawing.

This is useful because when you turn it on the internal MSG color gradient is regenerated on the fly from the local source image. This will allow a MSG texture generator to generate texture coloring that matches the source image as you draw.

Palette Map

Specifies how the internal MSG color palette # 1 can be adjusted or recomputed while drawing.

Angle Mod

Specifies angle modulation options for the internal MSG processors.

TG Option

Specifies options for how temporal generator frame timing is computed when using the MSG preset for interactive painting.

You can frame index the internal MSG temporal generators using the path distance as opposed to current animation frame time. This allows the temporal generators to oscillate as the pen is moved while drawing.

Alpha Out

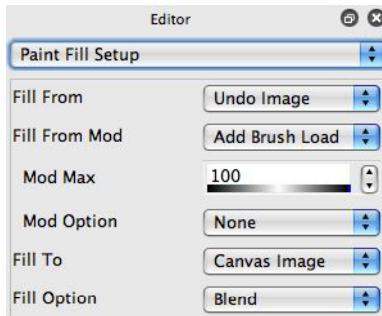
Specifies how the MSG alpha output is used within the overall paint synthesizer. This allows you to generate your brush alpha directly from the MSG effect as opposed to the normal Source Brush if you so desire.

Important:

Keep in mind that none of the various Brush Load control parameter settings will mean anything if you do not choose Brush Load as a paint source option in the paint Fill setup control panel.

You can use the MSG Save in Preset parameter in the Miscellaneous control panel to determine if you want to save the current MSG preset embedded within the paint preset file. Typically you will want to do this to fully reproduce a MSG Brush Load effect.

Paint Fill Setup



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. The parameters associated with the actual application of the paint dab to the Canvas are specified in the Paint Fill Apply control panel.

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. These are all specified by parameters in the Paint Fill Apply control panel.

The editable Paint Fill Setup parameters are detailed below:

Fill From

Determines the Fill From source, which is applied to the dark parts of the brush. The source can be a solid color, or an image depending on the setting.

Typically this is the color that will be in the center of the generated paint dab for a spherical source brush.

Fill From Mod

Determines a Fill From modulator effect, which can modify the appearance of the Fill From signal.

This modulator introduces another color or other image signal into the paint dab which will be located between the center of the dab and its edges for a typical spherical source brush.

Max Mod

Percentage of the Fill From modulation effect.

Increasing this value typically makes the effect more pronounced, decreasing it typically makes the effect less pronounced.

Mod Option

Specifies an interactive modulation source for the Fill From modulator effect. This modulator will interactively control the overall modulation of the Fill From Modulation effect.

Fill To

Determines the Fill To source, which is applied to the light parts of the brush. The source can be a solid color, or an image depending on the setting.

Typically this is the coloring that will be at the edges of the generated paint dab for a spherical source 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.

Some of the specific Fill Options have additional editable parameters associated with them.

Dither Fill Option

The Dither Fill Option using a dithering algorithm to transform the current brush image using either the brush image or another image signal. The output of the dithering threshold algorithm over the area of the current brush determines whether the Fill From or Fill To coloring is used at that pixel location in the computed dithered brush.

Dither Source

Determines a source for the computation dithering operation.

Threshold

Determines the threshold signal used in the computational dithering operation.

Invert

Inverts the specified dithering source prior to thresholding.

Range Fill Option

This Fill Option will only fill the canvas if the associated Source image locations match the specified luminance range values.

Range Option

Determines the min and max luminance range values used to restrict drawing.

MultBlend Fill Options

This fill option multiplies the computation brush image by another signal prior to generating the dab of paint.

Multiplier

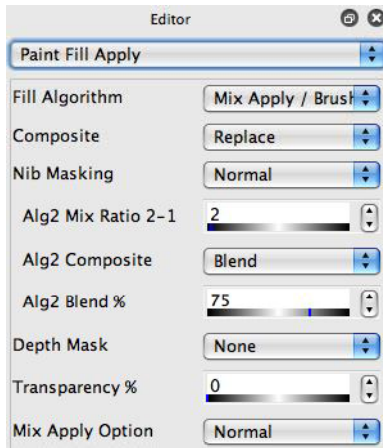
Specifies a signal that is multiplied times the brush image before the multiplied brush image is used for blending the Fill From and Fill To coloring values.

This control provides an easy way to use the Background Texture to simulate a paper texture when drawing.

Invert Multiplier

Inverts the multiplier signal before brush multiplication takes place.

Paint Fill Apply



Determines how the paint dab generated with the Paint Fill Setup parameters is actually applied to the Canvas. The paint dab can just be dumped on top of the existing canvas or it may interact or composite with it in a specified way. Masking options can also be specified that influence how and where the dab is applied to the canvas.

Certain paint fill algorithms can also generate a second paint fill process with different parameters that interacts and runs in parallel with the primary paint fill process. This is typically the case with liquid paint presets.

Fill 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.

By compositing, we mean we take the paint dab image and what is currently on the canvas and combine them together using a specified compositing algorithm to create a new dab image that is then placed on the canvas.

Nib 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.

Dual Fill Algorithms (Mix Apply)

Mix Apply Algorithm settings are actually composed of two different algorithms that are alternately applied in sequence. So Alg1 will be used to apply a paint nib and then Alg2 will be used to apply N paint nibs, with the cycle then repeating until the complete path is drawn. The controls below are active when a Mix Apply algorithm is specified.

Alg2 Mix Ratio 2-1

Specifies how many Algorithm #2 path applications alternate with one Algorithm 1 Apply path applications.

This parameter will interact with the perceived paint dab spacing, so you may need to go to the Path Application control panel and adjust the spacing setting there to get the overall desired dab spacing effect.

Alg2 Composite

Specifies a 2nd compositing operation that determines how the paint dab interacts with the existing Canvas for the second Mix Apply Algorithm.

Alg2 Blend %

Determines a 2nd maximum paint blend to the Canvas in percent for the second Mix Apply Algorithm.

Depth Mask

Determines if a Z depth mask and buffer is used for paint application. Turning this option on limits the paint's ability to overdraw the already drawn portion of a paint stroke. The setting determines what is used to draw into the depth buffer.

Transparency %

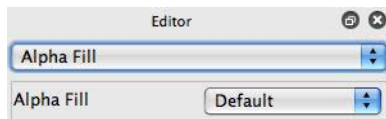
Specifies an additional transparency for the overall paint application to the canvas.

Mix Apply Option

Normal means that the Mix Apply dual mode fill algorithms will work normally as described in the previous section.

Switching from the Normal setting allows for a specific modulator to be used to modulate between fill algorithms 1 and 2. Switching from Normal will cause the Alg 2 Mix Ratio to be ignored since the modulator will be interactively controlling which fill algorithm is used.

Alpha Fill



The Paint Synthesizer will not specifically draw into the current layer's alpha channel unless it is specifically setup to do so.

In version 4 you use the Canvas : Alpha : Paint Synth Alpha Enable menu flag to turn alpha drawing on or off.

Studio Artist versions prior to version 3 used specific settings in each paint patch to determine if alpha drawing would take place or not. This was a problem because you needed 2 versions of a particular preset depending on whether you wanted to do alpha drawing or not. Later versions improved on this by making overall control of alpha drawing a switchable global parameter for all paint presets.

There are a number of different parameters that determine the specifics of how drawing to the alpha channel takes place.

Alpha Fill

Determines which alpha generation technique is used if active. Default is the most common and disables the other parameters.

Alpha Blend

Specifies an alpha blend option.

Alpha Apply

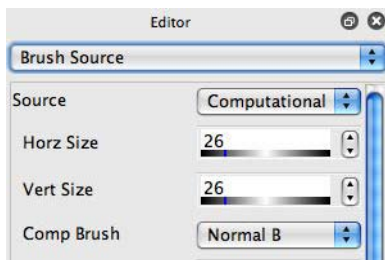
Determines how the computed alpha dab is applied to the alpha frame of the Canvas.

Alpha FillTo Option

Correctly modulates the FillTo Source for alpha painting. Switch on for paint tools that

blend to the Canvas so they will be smart about generating the appropriate Fill To signal based on the current alpha channel values.

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 its 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.

This control panel is where you specify the overall maximum brush size. The brush size actually drawn may be modulated or adjusted off of this overall maximum brush size based on the settings in the Brush Modulation control panel.

Brush Source

Computational brushes are generated algorithmically. 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. Generative brushes are generated in real time when drawing and their shape can be interactively modulated while drawing. MultiNib brushes use multiple instances of a simple computational brush to simulate bristle effects.

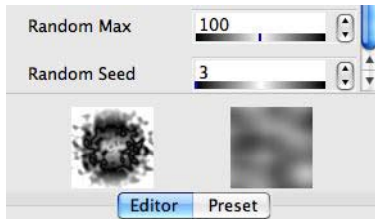
MSG Live brushes use a MSG preset to dynamically generate the brush when drawing. This is the way to infinitely extend the power of the Studio Artist source brush by building your own custom MSG presets to generate brush shape.

Computational Brushes

Computational brushes are generated algorithmically. The basic algorithm generates a smooth symmetrical spherical brush that blends from black at the center to white at the edges.

There are many interacting parameters available to adjust the appearance of the computational brush. They can modulate the shape and falloff of the smooth brush as well as modulate or invert symmetry.

Additional controls can randomize the brush. Randomization can be static or applied dynamically every time the brush is generated. The source brush image will interactively update as you adjust the parameters.



There is a dynamic preview image that updates in real time as you move the parameter sliders to show you how the parameter adjustments changes the computation source brush. The preview image size is independent of the actual brush size. It's purpose is to show off the overall source brush appearance in real time as you edit the controls. It's located at the bottom of the Editor on the left side.

Horz Size

Determines the max horizontal dimensions of the brush.

Vert Size

Determines the max vertical dimensions of the brush.

Comp Brush

Type of computational brush. They all look different, try them and see.

Bias/Gain

Define a luminance transfer function for the computational 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.

Symmetry

Specifies specific symmetry algorithm adjusted by Pre-Sym and Post-Sym settings.

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.

Random Amount

Increasing this control increases the amount of brush randomization.

Random Increment

Adjusts the spatial frequency of the randomization.

Random Min
Random Max

Additionally adjusts the appearance of the RndRadius random type option by controlling the min and max brush radius for the randomization process.

Random Seed

Specifies a unique random seed for the source brush randomization process. Changing the seed value will change the appearance of the randomized brush shape.

Important:

The source brush can be size and orientation modulated. A complete set of size and orientation modulated computational source brushes are cached in ram internally in the Paint Synthesizer. The settings in the Brush Modulation control panel for # of Sizes and # of Orientations determine how many separate brush images are actually cached in memory.

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 : Paint Synthesizer**” main menu. The brush file name, size, and the brush itself are displayed.

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 and cached 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 its 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.

Most applications of Image Brushes can use a fairly small image size (like 64 x 64 pixels for example). Keep in mind that based on the settings in the Brush Modulation control panel a large number of image brush copies at different scales and rotations may be stored in the brush cache. This can chew up a lot of memory if the image size is large.

Determines the overall size scaling of the resulting image brush. If you want to rerender your canvas and painting to a higher resolution after you are completed drawing, then set this to less than 100% when you do your original drawing and use a larger brush size. Choose the percent so that when you rerender you will end up with a rerendered 100% scale.

The following information is displayed in the Brush Source control panel but can not be edited.

Brush Name

Name of the image brush file.

Brush Size

Size of the image brush (horizontal x vertical).

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 Text edit field in the Brush Source control panel.

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. Text Brushes can be used to paint a text message or as a paint texture effect.

There are specific Path Application Options for text spacing that should be used for typical text brush presets. These options take into account the specific font and lead to better results than the normal options used for generic painting.

TB Style

Determines the text style used for the text brush.

TB Font

Determines the specific font used for the text brush.

TB Size

Determines the size of the text brush source.

TB Position Mod

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

TB Save Text in Patch

Turn on this check box if you want the current text brush source to be saved with the preset.

Text

The text string that will be drawn.

How Text Drawing Works

Normal usage of the text source brush works as follows. Each font is rendered into the brush cache buffer at the maximum brush size, and then interpolated down to the final sized brush image which is raster filled to the canvas. So your Size Interpolation parameter in the Brush Modulation control panel should be set to Interpolation for best results.

There is a way to draw the text source brush directly into the paint canvas using anti-aliased drawing. To do this use the AntiAliased Solid Brush Type with it's Type option set to Text. This can give a better crisper text rendition at the cost of circumventing the normal paint synthesizer paint nib fill engine which allows for a wide range of different paint fill effects.

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 : Paint Synthesizer” 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.

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 and cached in memory. The load Status parameter allows you to control the caching or lack of it if you do want to work with large movie frames as a brush.

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 its 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.

MB Indexing

Specifies 1D or 2D index modulation for determining the frame positioning while you draw. 1D indexing uses a single modulator to index into the entire set of frames.

2D indexing uses 2 different modulators to access all of the frames. The entire range of frames are treated like a two-dimensional array for the purposes of modulation indexing. You need to organize the images associated with the individual frames in your movie according when designing and building a movie brush that will use 2D indexing.

Movie Brush size and orientation modulation will occur independently of the 1D or 2D frame modulation specified here. By properly designing the individual frames in your movie brush, you can use the individual frames to represent an additional 1 or 2 axis of brush modulation. What these axis of modulation specifically represent is only limited by your imagination.

The following parameter is available for 1D indexing:

MB 1D Frame Mod

Determines how the current frame positioning in the movie is modulated. For example, sequential will run through the movie frames sequentially as you draw.

The following parameters are available for 2D indexing:

MB 2D Mod A

Specifies a modulator for the first axis of frame modulation

MB 2D Mod B

Specifies a modulator for the second axis of frame modulation

MB 2D A Dimension

Specifies how many frames are in one cycle of the first A axis of modulation. The dimension of the second B axis will be the total number of frames divided by the size of the A axis.

MB Attribute Index

Determines the indexing used for the frame positioning modulation.

MB Load Status

Determines whether the entire movie brush is preloaded into memory or read from disk while drawing. Preload is useful for fast interactive movie brushes.

Disk Draw is useful for using a movie brush to composite larger movie files in paint action sequence animations or movie processing. However, it will draw much more slowly since the disk will be accessed every time a brush nib is drawn.

Choosing Preload when you have a large movie file can potentially lead to a total loss of all available memory. Studio Artist tries to be smart and automatically switch to DiskDraw if it appears this might happen.

The following information is displayed in the Brush Source control panel but can not be edited.

Brush Name

Name of the movie brush file.

Brush Size

Size of the movie brush (horizontal x vertical).

Generative Brushes

This brush dynamically generates the Brush Source computationally on the fly in real time. This allows for the overall shape of the brush to interactively be modulated based on things modulation sources like pen tilt and tilt orientation.

This Brush Source is different than the others in that the Brush isn't internally cached at different sizes and resolutions. The dynamic on the fly brush computation allows for the interactive shape control while you draw and can lead to some very expressive paint patches.

You can use this brush type to easily simulate the effect of tilting a physical pencil tip or piece of rectangular chalk, which changes the overall shape and area of the drawing tool that touches the canvas.

Horz Size

Determines the max horizontal dimensions of the brush.

Vert Size

Determines the max vertical dimensions of the brush.

G Gen Type

Determines the specific generative brush algorithm used to compute the brush shape on the fly while drawing.

G Orient Type

Modulation source for the generated brush orientation. This setting overrides the Brush Modulation orientation settings, which are associated with cached brush orientations used in the older precomputed source brush types.

G Orient Offset

Fixed orientation offset for the generative brush orientation modulation.

MultiNib Generative Brushes

Some of the Gen Type options include a MultiNib labeling. These use multiple instances of a generative brush to simulate bristle effects. They work off of some of the current MultiPen mode settings.

Rotation Generative Brushes

Some of the Gen Type options include a Rotation labeling. These are designed to be used with the Wacom ArtPen which includes a pen axis rotation modulator. If you use them with a normal pen or mouse it may not be obvious what they are doing.

MultiNib Brushes

This brush dynamically generates the Brush Source computationally on the fly in real time. The current MultiPen control parameters are used to define the dynamically generated source brush.

If you use this source brush with a multi-pen pen mode then you essentially get a doubling effect, since a dynamic image of the multi-pen nibs will be drawn at each multi pen nib location.

Horz Size

Determines the max horizontal dimensions of the brush.

Vert Size

Determines the max vertical dimensions of the brush.

Nib radius %

Defines the size of the nibs as a percentage of the overall brush size.

MSG Live Brushes

This brush dynamically generates the Brush Source computationally on the fly in real time. The current MSG preset is used to define the dynamically generated source brush.

By building your own custom MSG presets and using this source brush option you can infinitely extend the power of the Studio Artist source brush.

Typically you would want to save the MSG preset as a part of the overall paint preset. This can be done by turning on the MSG Save in Preset option in the Miscellaneous control panel.

Horz Size

Determines the max horizontal dimensions of the brush.

Vert Size

Determines the max vertical dimensions of the brush.

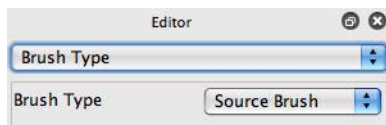
MSG TG Option

Defines an option for how internal Temporal Generators (TG) are index modulated in the MSG preset.

MSG Angle Mod

Defines a global angle modulation applied to appropriate MSG parameters.

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 applied to a dynamic algorithmic texture generator specified here. The final brush used for painting is the result of the interaction of the Brush Source and the specified Brush Type, as well as the size, orientation, and luminance modulation settings specified in the Brush Modulation control panel.

Be aware that some specific brush Type options override or replace the source brush and may use custom fill code that bypasses the normal paint synthesizer paint nib fill engine.

For example, all of the geodesic brush types (except geodesic source brush) run their own dynamic fill code that ignores the source brush settings since the brush is actually a dynamic spreading process generated on the fly when drawing.

The AntiAliased Solid brush type also bypasses the normal paint nib fill code and allows for true anti-aliased vector drawing to occur in the paint canvas (at the price of losing most of the additional special effects and organic feel that can be created with the regular paint synthesizer raster fill engine).

Brush Type

A specific type of brush generation algorithm as detailed below.

Source Brush

Just uses the Source Brush as the paint brush. No additional textures are generated and the Source Brush is not modified in any way.

Stretch Source Brush

Stretches the Source Brush along the overall drawing path.

Stretch1 Source Brush

Stretches the Source Brush along the path while performing an area fill instead of a one-dimensional stretch.

Procedural Stretch

Like a stretch brush but filled with algorithmic texture

Procedural Brush

Typically the most popular brush algorithm. A number of different associated parameters determine the overall appearance of an algorithmic procedural texture. The dynamic algorithmic texture can interact with the Source Brush in different ways depending on the Brush Op setting. The actual dynamic brush used for drawing is a combination of the source brush and the dynamic procedural texture.

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 overall drawing path.

Source Alpha Brush

Just uses the Source Brush alpha channel only as the source brush for Paint Fill calculations.

Elliptical Cone

Dynamic elliptical brush shape is modified by the pen tilt and tilt orientation. Can be used to simulate the behavior of real world media that change drawing shape depending on the paint tool tilt and tilt orientation.

Geodesic Contour

Algorithmic brush that don't use the source brush and adaptively configures based on the source image luminance. Good for a certain kind of fractal texture look, simulation of capillary bleed, or certain unique stylistic or wash effects, all of which are based on the underlying Source Image luminance contours.

Geodesic Source Brush

Algorithmic placement of the source brush based on a geodesic spreading algorithm. Can be used as an alternative to Particle Pen mode to create dynamic bubbling or spreading paint effects.

Procedural Smoothed Brush

Just like the normal Procedural Brush type except the procedural brush texture is anti-aliased for a smoother looking texture and associated slower drawing performance.

AntiAliased Solid

An alternative computational brush that bypasses the normal paint synthesizer raster paint nib fill engine. Anti-aliased vector drawing is used to fill in the paint stroke. The size of the source brush is used but the other source brush parameters are ignored (except for the text source brush parameters which are used when the Type option is set to Text).

Hint:

The Brush Type parameter can be a little confusing, because a few of the choices are rather esoteric and kept around for compatibility with very old Studio Artist presets. Source, Procedural, Geodesic, and AntiAliased Solid settings are most commonly used.

Specific Brush Generation Parameters

Each of the different Brush Types has a number of specific editable parameters. The parameters associated with each of the different brush types are detailed in the sections below:

Some of the Brush Type choices are more useful than others. Most presets use either the Source or the Procedural Brush. Geodesic brush types are also very useful for certain kinds of presets. Be aware that Geodesic brushes draw very differently than the normal brush types and some Paint Synthesizer functionality may be disabled for Geodesic brush types.

Some of the other Brush Types are kept around for compatibility with older Studio Artist presets from the initial release. They may also be useful for certain special effects.

Stretch1 Source Brush

Orient Type

Determines the orientation modulator for the stretching source brush.

Orient Offset

Specifies an angle offset for the orientation modulator.

Tracking

This unlabeled popup specifies the specific tracking algorithm used for the orientation modulation.

Geodesic Circular

Geodesic Rectangular

Geodesic Contour

Geodesic brushes operate very differently than the other brush types. They don't always behave like the other brush types, but can generate very unique fractal or geometric visual effects.

Unlike the other brush types, geodesic brushes do not interact with the Source Brush in any way. They totally override it as they draw.

Brush loading also does not currently work with geodesic brushes. The current paint color is substituted instead of the brush load operation if brush load is specified for path fill from parameter in Paint Fill Setup.

Bias / Gain

Define a luminance transfer function for the geodesic brush algorithm.

Geo Max Count

Determines the maximum size of the geodesic brush.

Note that the size controls in the Brush Source control panel are ignored for geodesic brush types. The brush Modulation size controls are active and will modulate the maximum size specified here. The overall size of the Geodesic Rectangular option also depends on the Iterations setting.

Geo Random Count

Specifies the random indexing associated with the geodesic brush algorithm.

Set it to 0 for no randomization. Typically set to 2 for a random setting.

Geo Wet Mix

Determines whether wet paint mixing is path or pixel based.

The Geodesic Rectangular brush type also includes several specialized parameters detailed below:

Geo Invert

Inverts the geodesic brush shape when turned on.

The Geodesic rectangular Brush Type include some additional parameters.

Geo 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 specified by the Max Count parameter.

Be careful as you increase this value or the geodesic brush may spread out quickly and essentially draw the entire canvas.

Geo Move Radius

Specifies a radius for the geodesic movement. Increasing this value increases the spread while also randomizing the rectangular patterning.

Geodesic Source Brush

The Geodesic Source Brush is different from the other geodesic brush types because it does use the source brush nib for drawing. The placements of the source brush nibs are dynamically generated from a geodesic placement algorithm that spreads from the path. A geodesic scaling factor is also generated for the brush nibs based on the distance from the nib to the original path position. Most of the associated parameters are the same as the normal geodesic brushes with a few additions described below.

Geo Spacing

Specifies the spacing in pixels of the application of source brush nibs along the generated geodesic spreading paths.

There is a Geodesic Source Brush modulator that is available in parameters like the Orient modulator parameter in Paint Source Offset. Use this modulator to get an orientation modulation that tracks the spreading of the source nib

Procedural StretchProcedural BrushProcedural Smoothed Brush

These brush algorithms are based on dynamic texture generators. They generate brush textures computationally on the fly as you draw. The texture can either always be the same or always be different, which is great for organic looking images that have the subtlety of nature.

Procedural brush is one of the most common brush types and is used in many presets. Procedural Stretch is rarely used and really a specialty brush type. The Procedural Smoothed Brush is an anti-aliased version of the Procedural Brush. It generates a smoother procedural texture at the cost of slower drawing time.

Several parameters can be modulated interactively, including texture orientation and clipping.

Orient Type

Determines the orientation modulator for the procedural texture generator.

Orient Offset

Specifies an angle offset for the orientation modulator.

Tracking (popup)

This unlabeled popup specifies the specific tracking algorithm used for the orientation modulation. The Tracking and the Orient modulation type work together to determine the particular visual effect desired for the texture generation.

There are some useful paint macro menu edits available in the 'Edit : Paint Synthesizer : Macro Edit' menu that can quickly set up the tracking controls for different editing

situations.

Bias

Specifies the nonlinear bias luminance mapping for the generated texture.

Watch the interactive texture display in the pane while adjusting to get a feel for what the control does.

Gain

Specifies the nonlinear gain luminance mapping for the generated texture.

Watch the interactive texture display in the pane while adjusting to get a feel for what the control does.

Clip

Specifies maximum clipping for procedural texture.

Clip Mod

Specifies modulator source for clipping. Clipping will modulate to the max clip setting if modulated.

Random Start

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

Invert

Inverts the generated texture (if checked).

Brush Op

Specifies the interaction between the generated brush texture and the source brush nib.

Turbulence

Specifies the specific overall turbulence algorithm used to generate the procedural

texture.

Noise is the most common choice. The cellular types run slower but have a different visual appearance.

Type

Specifies different options for the procedural noise generation that can allow modulation based on the source image or canvas image.

3D types modulate the procedural texture as specified and can create visual complexity or more intelligent texturing effects at the cost of slower drawing time.

Levels

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

Increasing the # of levels generates more visual complexity in the texture at the cost of slower drawing response.

Alg (algorithm)

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

Changing the Alg changes the visual appearance of the texture. Watch the interactive texture display as you adjust the parameter to get a feel for the different Algorithms.

Path Length Inc

Specifies the texture scaling along the direction of the path.

Path Width Inc

Specifies the texture scaling perpendicular to the path.

Mix Apply Option

Allows for source brush override for paint mixing in dual mode fill algorithms.

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.

AntiAliased Solid

This brush type provides for true anti-aliased vector drawing at the cost of circumventing the normal raster paint nib fill code (and the wide range of special effects and organic paint looks that can achieve).

Many of the normal paint synthesizer paint fill controls will be ignored when using this brush type since the controls do not apply to solid fill vector drawing. This brush type is very useful for generating thin lines or crisp vector shapes.

Vector Type

The specific type of vector drawing used to fill the paint stroke.

Dual Fill

None turns it off. The other options allow for hybrid vector-raster drawing presets to be constructed. The vector path is first drawn and then a second pass is applied based on the normal source brush raster fill engine.

Full Apply means the normal raster paint nib fill settings are used. Mix Apply means only the second Alg2 fill algorithm in a dual mode mix apply fill algorithm is used.

One use for dual fill would be to apply a wet water raster paint fill to the solid anti-aliased vector drawing to give it a more organic or natural looking feel.

Size Scale

An additional size scaling (in percent) applied to the computational source brush horz and vert size dimensions.

Poly Opt

Determines the kind of vector nib drawn when building up the path shape.

Rim Opt

Specific coloring options for the rim of the vector nib.

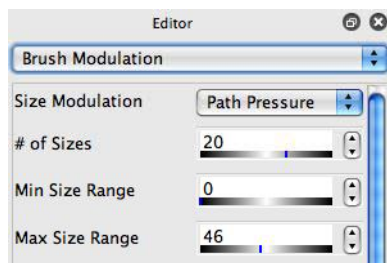
Color Opt

Specific coloring options for the interior of the vector nib.

Particle Track

When turned on, the vector drawing is smart about tracking individual particle movement in particle pen mode. When off, the vector tracking moves around the entire particle swarm.

Brush Modulation



Determines how the brush size and orientation are modulated. Modulation can be interactive or algorithmic. A fixed number of brush sizes and orientations are precomputed to speed up interactive drawing. There are adjustable controls to specify how many precomputed brushes are generated. The total number of precomputed brushes will be the # of size brushes times the # of orientation brushes.

The different size and orientation brushes are generated from the Source Brush. The actual horizontal and vertical brush size specified in the Brush Source control panel maps to 100% brush size modulation in this control panel.

Be aware that there is an initial time penalty associated with precomputing a large brush cache. As the max source brush size increases this initial lag when first using a preset after editing a parameter associated with the brush cache can become noticeable. Try to avoid having a large number of brush sizes and brush orientations since the total number of brush cache images is those 2 numbers multiplied together.

Both the brush size and orientation can be modulated dynamically while drawing. There are a large number of potential modulation sources that can be chosen from.

Brush Sizes

How many different size brushes are generated

Size Modulation

Determines a modulation source for controlling the brush size

Min Size Range

Max Size Range

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

Size Interpolation

Type of interpolation algorithm used to generate different size brushes.

Size Option

Specific axis options for the brush size interpolation algorithm.

Size2 Modulation

Determines a secondary modulation source for controlling the brush size. Modulates to a maximum variation determined by the Size 2 % 2nd Mod slider.

Useful for adding additional variation into the brush size modulation to achieve more realistic paint stroke simulations.

Size 2% 2nd Mod

Determines the percent size modulation for the second size modulator.

of Orients

How many different orientation brushes are generated

Orient Mod

Determines a modulation source for controlling the brush orientation

Orient Variation

Determines the maximum brush orientation modulation amount.

Orient Offset

Determines an initial orientation offset for brushes.

Orient Interpolation

Type of interpolation algorithm used to generate the different orientation brushes.

Lum Modulation

Modulation option that specifies a controller signal that dynamically modulates the current brush with the current modulation texture source. None turns this option off.

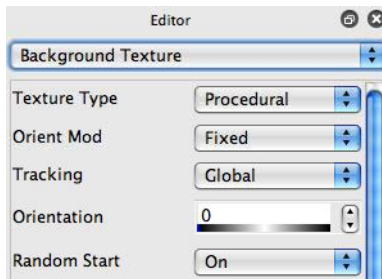
Lum Mod Tex Src

Specifies the particular source used for brush luminance modulation.

Lum Mod Option

Determines how the luminance modulation source signal interacts with the current brush if a specific Luminance Modulator has been chosen.

Background Texture



The background texture is available throughout the paint synthesizer as a modulation source. One typical use would be to modulate a paint fill operation based on a dynamic texture. The texture can either be algorithmic, an image file, a movie file, text, live video, or the output of the texture synthesizer.

The background texture can be static or dynamic depending on the parameter settings. The background texture can be used for things like simulating paper texture or other textural properties of media, or as a second texture source to modify the algorithmic paint brush.

Seed

Numerical seed for the random number generator.

Texture Type

Procedural is an algorithmic texture. BW Image and Color Image is based on a source image that is replicated according to a user definable symmetry or mosaicing pattern to cover the canvas. Movie is based on a source Quicktime Movie that is replicated according to a user definable symmetry or mosaicing pattern to cover the canvas. Tex Synth is based on the current Texture Synthesizer settings and is generated procedurally from those settings. Live Video captures live video.

Generic Background Texture Parameters

Below are the generic adjustable parameters for all background texture types. An interactive preview of the generated background texture is displayed at the top of the control panel and can be used as a visual aid while editing these parameters.

Depending on how the orientation modulation and tracking controls are set up, the background texture could follow the brush path when drawing or could render a fixed background rectangular texture field.

Several paint synthesizer macro edit menus provide a way to quickly edit these parameters when you are working.

Orient Mod

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

Tracking

Angle tracking option for orientation computation.

Orientation

Determines the spatial orientation of the texture.

Horizontal/Vert Offset

Determines a horizontal and vertical spatial offset for the texture.

Random Start

New texture generated for each paint stroke if checked. Otherwise the same texture is used each time a stroke is applied.

Invert

Grayscale inversion option for the background texture.

Bias/Gain

Nonlinear mapping transform parameters or the texture.

Procedural Textures

The procedural texture is based on a computational texture generator. Depending on its associated parameter settings, it can either be used to generate a fixed background texture or as a second dynamic brush texture that tracks the pen or mouse.

The size, and spatial position of the texture pattern can be adjusted. Orientation of the texture pattern can be a fixed adjustment or dynamically modulated. As you adjust parameters you can see the effect on the texture field by observing the small texture preview image in this control panel.

Below are the unique adjustable parameters for procedural background textures.

Size
Directionality

These controls interact to determine the spatial size and directionality of the generated texture.

The 2 controls interact so you may need to do some tweaking back and forth.

Turb Type

Allows you to choose the overall Noise generation approach used for the procedural texture. The Noise setting is a multi-octave bandpass turbulence generator. The two Cellular settings use a different generator based on multi-octave cellular noise.

Alg (algorithm)

Specific type of turbulence sub algorithm for a particular master noise generator.

Levels

of octaves of turbulence. Increasing this number slows down texture generation so increase with care. Typically you would not use a number beyond 3 or 4 octaves.

Image Textures / Color Image Textures

Image textures are defined by tiling a rectangular texture image. The image is read from disk. You should store your texture images in the Brush folder. Symmetry operations can be specified for the tiling replication operation.

Depending on its associated parameter settings, it can either be used to generate a fixed background texture or as a second dynamic brush texture that tracks the pen or mouse.

Below are the unique adjustable parameters for image background textures.

Scale

Scaling percentage option for the overall size of the applied image 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.

Movie Textures

Movie textures are defined by tiling a rectangular texture movie frame. The Quicktime movie frames are read from disk. You should store your texture movie files in the Brush folder. Symmetry operations can be specified for the tiling replication operation.

One fun use of movie background textures is to build up photo mosaic images. A large collection of smaller images stored in the movie texture can be used to represent a much larger image. Studio Artist is unique in that photo mosaics do not have to be composed of a rectangular grid of smaller images (although you can certainly generate grid based photo mosaics if you want to).

Movie background textures also allows for the development of very sophisticated interactive brushes or special effects. Up to two different interactive control modulators can be used to index modulate the movie texture. Like many things in Studio Artist, the editing an creative possibilities using movie background textures are really unlimited.

Below are the unique adjustable parameters for movie background textures.

Scale

Scaling percentage option for the overall size of the applied image 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.

Attribute Index

Determines the attribute indexing used for the frame positioning modulation.

Load Status

Determines whether the movie texture is preloaded into memory or read from disk while drawing. Preload is useful for fast interactive movie brushes. Disk Draw is useful for using a movie texture to composite larger movie files in paint action sequence animations or movie processing.

Movie texture can take up quite a bit of memory as the frame size starts to increase if you preload them into memory. Be intelligent about choosing the frame size of the movies you are working with. Typically they should match the maximum brush size unless you have good reasons not to do this.

You can always rescale a movie file by either using a simple PAsEq processing pass in Studio Artist or by changing the size of an export in Movie Player Pro.

Indexing

Specifies 1D or 2D index modulation for determining the frame positioning while you draw. 1D indexing uses a single modulator to index into the entire set of frames. 2D indexing uses 2 different modulators to access all of the frames. The entire range of frames are treated like a two-dimensional array for the purposes of modulation indexing. You need to organize the images associated with the individual frames in your movie according when designing and building a movie brush that will use 2D indexing.

The following parameter is available for 1D indexing:

1D Frame Mod

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

example, sequential will run through the movie frames sequentially as you draw.

The following parameters are available for 2D indexing:

2D Mod A

Specifies a modulator for the first axis of frame modulation

2D Mod B

Specifies a modulator for the second axis of frame modulation

2D A Dimension

Specifies how many frames are in one cycle of the first A axis of modulation. The dimension of the second B axis will be the total number of frames divided by the size of the A axis.

Movie Pixel Index Textures

The controls for this kind of movie texture are the same as the normal movie texture. The difference is that Movie Pixel Indexing uses the frame index modulation for each pixel of the generated texture as opposed to once per brush nib. This per pixel indexing allows for the creation of pixel accurate shading effects based on the individual movie frames.

For example, a shading texture could be created where each movie frame corresponds to a different luminance rendering. Normal Movie Texture indexing could be set to choose the appropriate movie frame to render the source luminance across the entire brush nib. However this does not allow for fine detail rendering, just a course rendering at the spatial resolution of the size of the brush nib.

Using Movie Pixel Indexing instead allows for each pixel of the texture in the brush nib to be indexed from the correct movie frame for the rendering required for that pixel. Because the movie frame indexing is pixel accurate, the derived shading is also pixel accurate. This leads to a very tight shaded rendition at the cost of a slower brush due to the increased computation associated with the pixel indexing.

Some really nice hatching paint and drawing effect presets can be created with this option.

Because movie pixel indexing works at the pixel level for frame index modulation, it's really only applicable to preloaded movie (as opposed to disc draw load status). Using disc draw load status for movie pixel indexing will slow the draw speed down to unacceptable levels.

Texture Synthesizer Textures

Texture Synthesizer background texture types use the Texture Synthesizer and its current parameter settings for texture generation. A complete set of Texture Synthesizer parameters are stored along with the normal Paint Synthesizer parameters in a paint patch preset if you are using this background texture type.

A block of texture equal in size to the current maximum brush size is generated and then used internally like it was an image texture. The parameter controls mirror those of an image background texture and are detailed in that section.

Live Video Textures

Live video background textures capture frame images from a live video stream while you draw. You can use a video input device that includes a Quicktime driver that allows for video image capture. Apple's new iSight firewire camera makes an ideal video input device.

A video frame is captured from a live Quicktime video stream and then used internally like it was an image texture. As you draw, the frame image will be updated. The live video texture can follow the brush path or map onto a flat rectangular background depending on how the background texture tracking parameters are set up. You can also use the symmetry parameters to generate kaleidoscopic texture symmetry patterns derived from the live video frames.

The parameter controls mirror those of an image background texture and are detailed in that section.

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 a specified Ip Source image by processing it with a particular effect and then placing the resulting processed image in the current Canvas Layer. Some image operations may also be modifiable or influenced by current Source visual attributes, global paint color memories, or the current region selection.

The specified Ip Source can either be the current Canvas image, the Source image, another Canvas Layer, or the current Region Selection.

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.

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-R**. To stop an executing image operation, press the Spacebar key.

You can use Image Operation Presets to access a specific Image Operation and its associated settings at the touch of a button.

Paint Action sequences can also be used to combine together different image operations in a sequence to generate more complex and varied visual effects. You can use Paint

Action Sequence 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. All of these controls are at the bottom of the individual effect control panels and are the same for every image processing effect.

These generic controls allow for specifying the image source for the processing effect, as well as mixing or compositing the processed Ip Source image with the original Current Canvas Layer. Repetitive Image Operations can also be specified.

The final output of the image operation is the result of the specified 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.

Try experimenting with the different settings to get a feel for how they change the resulting appearance of the effect.

Generic Parameters

Mix

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

Ip Source

Specifies where the input to the Image Operation comes from. This can be the Current Canvas Layer, the Source Image, the Current Canvas Alpha image, the Current Region Selection, or any of the individual Canvas Layers accessed by name. The output from the Image Operation is placed in the Current Canvas Layer.

The Source Image will be scaled to match the Current Canvas Layer size.

Composite

Specifies a compositing operation that takes the original Current Canvas Layer and the effected Ip Source image and algorithmically combines them in some specified fashion. The output of the compositing operation is then placed in the Current Canvas Layer at the completion of the image operation.

Different composite settings can completely change the overall appearance for any given Image Operation. For example, specifying an **Edge1** compositing operation on an image operation that blurs the Canvas image will generate a sharpening visual effect.

Certain composite settings will bypass the current Canvas Layer and place the effected image in either the current layer's alpha channel or the current Selection Region.

Composite Space

Specifies an additional color space or channel for the compositing to take place in.

Repetition

Specifies the number of times to iterate or repeat the image operation. The first iteration uses the current Canvas as the source for the image operation. Each iteration after the first one takes the effected output of the previous iteration and uses that as the source.

Randomization Parameters

Random

Determines properties of the random number generator seed. By seed we mean the initial starting parameters for the random number generator. Unique means that any random aspects of the Ip Op will always be unique or different on subsequent runs of the Ip Op. Use Seed means that a particular numeric Seed value will be used to prime or start the random number generator. This means the same series of random numbers will be generated each time the Ip Op is run. By changing the seed you can change the set of generated random numbers and subsequently the appearance of any random

aspects of the particular Ip Op in a reproducible manor.

Revert to last internal seed is useful if you were running the Ip Op in unique mode and would like to save an Ip Op preset or record the Ip Op in a PASEq and have the appearance of the last random Ip Op run.

Seed

Specifies a specific starting seed for the Use Seed option in the Random popup. Changing the seed will lead to a different set of reproducible random numbers.

Palette Parameters

Palette/Gradient Playback

Determines whether the color palette and color gradient stored in an Ip Op PASEq action step is played back in the Source Palette and Source Gradient or not.

Texture Synthesizer Modulation in Image Operations

Certain Image Operations contain Texture Synth Modulator options for specific parameters. When these options are chosen the current Texture Synthesizer parameters are used to generate a procedurally generated texture field that is used as a modulator for the Ip Op.

Support for Texture Synthesizer Ip Op modulators extends the functionality of individual Ip Ops by allowing both processing modules to work together to create visual complexity in the resulting effect.

Image Operation Terminology

Certain technical terms are used frequently in the Image Operation parameters. Don't be afraid of terms you may not understand at first, because you can always experiment by trying different options and seeing how they affect the overall processed output.

If you find something you like, export the settings as an Image Processing Preset Patch. Then you can call up the Image Processing Preset at a later date and use it in your work without having to focus on the individual editable parameters that make up the overall effect.

Image Processing Algorithms

Alg or Algorithm

An algorithm can be thought of as the formula used to generate a given image processing effect. Different algorithms typically generate different visual appearances for the resulting effect.

Compositing

Compositing algorithms take two different images as inputs and generate an output that combines the 2 images together using some kind of mathematical formula. The use of compositing in Studio Artist's Image Operations greatly extends the range of possible effects that can be generated. For example, an Image Operation that blurs the image can be turned into an enhancement or sharpening effect by using Edge compositing.

Geodesic

Technical name for a certain kind of processing algorithm used frequently in Studio Artist. A visual metaphor to think of this kind of processing might be colored water flowing out from either sampled points or image edges in the Canvas to cover the rest of the Canvas.

Nonlinear

Technical term refers to a certain kind of image processing with typically visually interesting and complex appearance.

Morphological or Morphology

Technical term refers to a certain kind of nonlinear image processing that focuses on the overall shape properties of images and how they can be modified.

Color Processing and Color Spaces

BW or Black and White

Monochrome image only composed of graytones from black to white.

ColorSpace

Colored images can be represented by different color spaces, which typically are composed of 3 component images. Changing the color space or the specific component image(s) that image processing occurs in can change the resulting visual appearance for the resulting effect.

RGB or Red,Green,Blue

ColorSpace composed of a Red, Green, and Blue component images.

YIQ

ColorSpace composed of a Luminance (Y), and 2 Chrominance (I,Y) component images.

LAB

ColorSpace composed of a Luminance (Y), and 2 Chrominance (A,B) component images.

LUV

ColorSpace composed of a Luminance (Y), and 2 Chrominance (U,V) component images.

HLS or Hue,Lightness,Saturation

ColorSpace composed of a Hue (H), Lightness (L), and Saturation (S) component images.

HVC or Hue, Value, Chroma

ColorSpace composed of a Hue (H), Value (V), and Chroma (C) component images.

Lum or Luminance

Luminance refers to the overall lightness or graytone of the black and white component of an image.

Chrom or Chrominance

Related to color or chrominance information associated with an image.

Sat or Saturation

The relative intensity of the color or chrominance information associated with an image.

Image Attributes

Min or Minimum

Smallest value in a range of values. Would be the darkest color in an image luminance range.

Max or Maximum

Largest value in a range of values. Would be the lightest color in an image luminance range.

Visual Attribute

Studio Artist has the ability to computationally generate Visual Attributes from an image. Visual Attributes can be thought of as psychological properties of an image related to how we visual perceive and process imagery in our brains.

Orient or Orientation

If associated with an angle it refers to the overall orientation of the angle. Think of a compass and where it is pointing. If associated with an image, think of each image pixel as having its own orientation compass or perceived direction of orientation.

Pixel

Images are composed of a 2 dimensional array of pixels. Each pixel is a number that

can go from 0 (black) to 255 (white)

Horz or Horizontal

Left to right position within an image.

Vert or Vertical

Top to bottom position within an image.

Image Operation Examples

All of the following descriptions of different image Operation effects include 2 effected example images to help you in understanding the visual appearance of that particular effect. All of these examples use the same 2 source images.



Example Source Image #1. Example Source Image #2.

Image Operation Presets associated with each of the different examples are also included. The can be accessed under Image Operation Presets in the Tutorial collection and the Ip Op Ex1 and Ip Op Ex2 Categories. The individual preset names correspond to the particular Image Operation they are illustrating.

Each of these examples were chosen to be generic examples of what can be visually achieved with a given image Operation. However, all of the Studio Artist Image Operations are capable of a much greater range of visual appearance than what is briefly detailed here. Keep in mind that by changing the editable parameters associated with a particular Image Operation or its Compositing setting, you may be able to radically change the resulting visual appearance of the effect.

For example, an effects that blurs the image can be turned into a sharpening or enhancement effect by switching the compositing from replace to edge compositing.

Adaptive Filter



Example Image #1.



Example Image #2.

Adaptively filters the Ip Source image in an intelligent way based on a specified visual attribute, which modulates some aspect of the filter kernel (like size or orientation).

Provides a way to intelligently smooth or nonlinearly process an image based on visual attributes associated with the modulation input. One use would be to provide a smear effect only at edges, or to smear smooth regions while leaving the edges intact.

Size

Specifies the maximum spatial extent or size of the adaptive filter.

Angle Offset

Specifies an angle offset for the adaptive filter calculation.

Symmetry

Specifies symmetry option of the adaptive filter kernel.

Algorithm

Specifies different algorithm variations for the adaptive filter.

Modulation

Modulation visual attribute input signal used to adaptively adjust the spatial extent or size of the filter.

Option

Specifies which aspect of the filter kernel is being modulated.

Adaptive Filter Convex Hull



Example Image #1.



Example Image #2.

Adaptively filters the Ip Source image with a convex hull nonlinear filter in an intelligent way based on a specified visual attribute, which modulates some aspect of the filter kernel (like size or orientation).

Provides a way to intelligently nonlinearly process an image based on visual attributes associated with the modulation input. One use would be to process only at edges, or to process smooth regions while leaving the edges intact.

Size

Specifies the maximum spatial extent or size of the adaptive filter.

Angle Offset

Specifies an angle offset for the adaptive filter calculation.

Symmetry

Specifies symmetry option of the adaptive filter kernel.

Algorithm

Specifies different algorithm variations for the adaptive filter.

Modulation

Modulation visual attribute input signal used to adaptively adjust the spatial extent or size of the filter.

Option

Specifies which aspect of the filter kernel is being modulated.

Block Abstraction



Example Image #1.



Example Image #2.

Abstracts the Ip Source 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 and a coarser representation. Increasing the complexity generates more colored blocks that better represent the original image edges.

Variation

Different computational options for the abstraction algorithm. They determine how the blocks are intelligently arranged to represent the original Ip Source.

Coloring

Specifies different options for how the individual blocks are colored.

Blur



Example Image #1.



Example Image #2.

Performs a softening blur operation on the Ip Source image.

The generic effect is to smooth the Ip Source, removing high frequency detail. Can be used with Edge1 compositing to provide sharpening effects.

Note that this particular blur effect introduces a darkening at the edges of the canvas for certain settings. Try using the Smooth Ip Op if this is a problem.

Blur Amount

The percent amount of blur. Increasing gives a smoother or more blurred effect. Decreasing gives more detail or a less blurred effect.

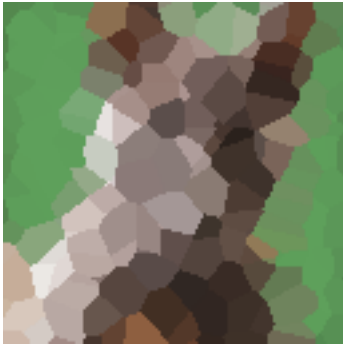
ColorSpace

The color space the blur is performed in.

Type

Allows choice between uniform blur and adaptive edge preserving blur.

Cellular Abstraction



Example Image #1.



Example Image #2.

Abstracts the Ip Source image as a series of colored cellular regions. Can also be used as a way to generate cellular image texture fields. Regions can be solid colored or generated from the underlying cellular noise.

Scale

Overall spatial scale of the cellular regions. Decreasing this control makes the regions smaller. Increasing the scale makes the regions larger.

Option

Specifies how the color for the regions is generated.

Noise

Specifies an option for the cell noise.

Self Modulation

Specifies a percent modulation of the cellular noise by the Ip Source.

Warp Option

Specifies warp transformation for the region spacing.

ColorEdge



Example Image #1.



Example Image #2.

Generates a colored thin edge rendition of the Ip Source.

This effect can be used in conjunction with the Interpolation effects like Geodesic Interpolation or Sparse Interpolator to generate more interesting effects that fill the entire Canvas. Color Edge is first used to generate a few representational edges. A second pass with one of the interpolation effects then regenerates a smooth representation based on the color edges extracted by this effect.

Variation

Algorithmic options for what kind of edge is generated.

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.

Min Length

Specifies a minimum length for an edge. Any edges less than the minimum length are discarded. Use this control to remove small noisy edges.

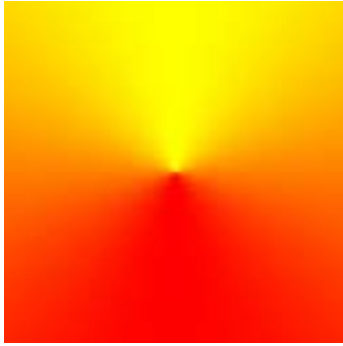
Edge

Specifies the algorithm used to generate the edges.

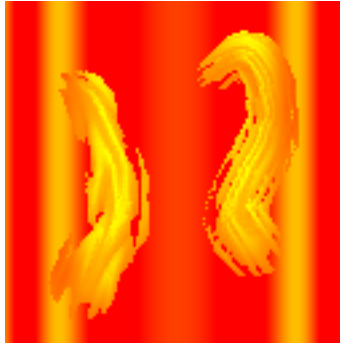
Render

Specifies how the generated edges are drawn into the canvas.

Color Gradient Generate



Example Image #1.



Example Image #2.

Uses the Source Color Gradient to generate color gradient effect. Primarily generates an abstract patterned image. The Ip Source can be used as a gradient modulator.

Angle

Angular orientation of the generated pattern.

Frequency

Spatial Frequency of the generated pattern.

Phase

Specifies phase of the gradient function.

Variation

Specific kind of pattern generated.

Option

Specifies normal or inverted pattern.

Modulation

Determines if Ip Source is used as gradient index modulator or not.

Horz Origin

Horizontal origin of pattern in percent. 50% would be the middle of the Canvas.

Vert Origin

Vertical origin of pattern in percent. 50% would be the middle of the Canvas.

Color Gradient Map



Example Image #1.



Example Image #2.

Generates a colorized version of the Ip Source image using the current Source Color Gradient. Typically used with a simple 2 color gradient to generate a duotone. More complicated color gradients can generate color contour effects.

Index

Selectable option for the Ip Source attribute used as the index to map into the Color Gradient to generate the final colorized output image.

Color PaletteMap



Example Image #1.



Example Image #2.

Generates a colorized version of the Ip Source image using the current Source Color Palette. This effect can be used to transform the color values in the Ip Source to mimic the overall color values or color appearance in a second color image. This can be used to make one image have the overall color appearance of another image. It can also be used for more wild extreme colorization effects.

Map Type

The type of visual attributes used in the color mapping.

Option

User selectable option for mapping algorithm. Several of these options also use the Source Color Palette memory #1, which is the left most one.

Preserve

Specifies color channel that is preserved from original input image. Allows for a more subtle color transformation that preserves more of the characteristics of the original input image.

Color Simplify



Example Image #1.



Example Image #2.

Simplifies a color image into a more cartoon like rendition consisting of flat colored regions. Regions can be outlined with black, or just a black outline image itself can also be generated. Multiple iterations blend allowing for a softer look.

of Colors

The number of colors to quantize to. Quantization refers to limiting the number of possible colors to a specific number specified here.

Min Size Prune

Minimum pixel size of a colored region. Any smaller regions are deleted and incorporated into an adjacent region.

ColorSpace

The color space the operation is performed in.

Combination

Which combination of the components of the specified colorspace are used.

Variation

Different stylistic variations for the algorithm. By choosing different options you can dramatically change the overall appearance of the effect.

of Iteration

The number of times the algorithm is run and self combined by blending.

Converge

The number of cycles for convergence in each iteration.

Color Simplify1



Example Image #1.



Example Image #2.

Simplifies a color image into a more cartoon like rendition consisting of flat colored regions. Regions can be outlined with black, or just a black outline image itself can also be generated. This algorithm works better for processing movies than the original Color Simplify Ip Op

of Colors

The number of colors to quantize to. Quantization refers to limiting the number of possible colors to a specific number specified here.

Min Size Prune

Minimum pixel size of a colored region. Any smaller regions are deleted and incorporated into an adjacent region.

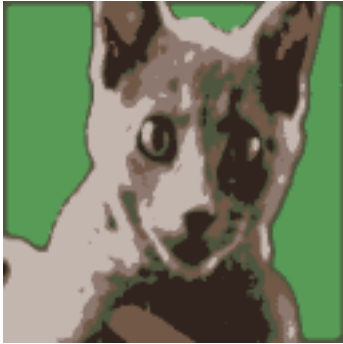
ColorSpace

The color space the operation is performed in.

Variation

Different stylistic variations for the algorithm. By choosing different options you can dramatically change the overall appearance of the effect.

Color Quantize



Example Image #1.



Example Image #2.

Quantizes or reduces the number of possible colors in the Ip Source image to a fixed number of colors. As the number of possible output colors is reduced, color contour artifacts will be seen. Some variation options allow for subsequent region recoloring.

of Colors

The number of colors to quantize to. Quantization refers to limiting the number of possible colors to a specific number specified here.

ColorSpace

The color space the operation is performed in.

Variation

Algorithmic option for the Quantization algorithm. Adaptive chooses colors to best represent the image. Uniform subdivides the entire colorspace uniformly without taking the image into account.

Colorize



Example Image #1.



Example Image #2.

Generates a colorizing special effect. By colorizing, we mean that the color attributes of one image are used to modify a different image so that the second image mimics the color appearance of the first. Can either be used for special stylistic effects or to make a painting or texture field more closely match the color appearance of the source image.

Image Source

The image visual attribute used as a source image to be colorized.

Color Source

The visual attribute used as a color source for the colorization of the image source.

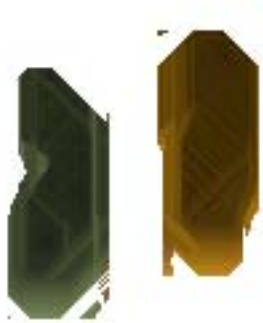
ColorSpace

The color space the operation is performed in.

ConvexHull



Example Image #1.



Example Image #2.

Generates a complex hull, which is a type of nonlinear morphological image operation. Typical use for this would be to generate an extreme stylistic effect.

Size

The spatial extent or pixel size 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. H and V refer to horizontal and vertical.

DeInterlace

Example images are not applicable.

Used to de-interlace the Ip Source image. De-interlace refers to generating a full resolution image from either the odd or even frame fields of a digitized analog video image.

You can use the Replace Even Field or the Replace Odd Field Effect Composite options along with the Fixed Image Ip Op to recombine 2 separate full frame field images into one interlaced image.

Field

Specifies the even or odd frame field for use as a source. The opposing field is removed and the spaces filled in to generate a full resolution image of the chosen field.

Displacement



Example Image #1.



Example Image #2.

Used to displace one image with the displacement properties based on a second image.

Amount

Specifies the amount of displacement in pixels.

Angle

Specifies the angle of displacement in degrees. If the displacement angle is being modulated by something as specified in the algorithm then this parameter specifies and offset angle to the modulation.

To be Displaced

Specifies the image source that will be displaced and then composited into the current layer.

Symmetry

Specifies the symmetry properties of the displacement.

Algorithm

Specifies the particular displacement algorithm used. You can choose the kind of displacement and the modulator for displacement using the choices in this parameter.

Smooth

Smooths displacement if turned on.

Invert

Inverts displacement if turned on.

Edge



Example Image #1.



Example Image #2.

Typically used as a black and White edge filter. Can also be used to enhance the edges in a color image. An edge signal is first generated with a specific type of edge filter. This edge signal can directly brought into the canvas of hard, soft, or adaptively thresholded before final display.

Edge

Specifies the type of edge filter used to generate the edge.

Option

Specifies how the edge will be displayed in the canvas.

Coloring

Specifies various coloring options for the displayed edge based on the generated edge signal.

Cleanup

Specifies whether edge cleanup (which tries to get rid of noise) is on or off.

Threshold

Adjusts the threshold used in the specific edge algorithm specified by the edge parameter above.

Soft Ramp

If a soft coloring option is specified this parameter controls the transition ramp from black to white.

LA

If a locally adaptive (LA) coloring option is specified this parameter determines the amount of local adaption. Increasing it means the algorithm becomes more locally adaptive, which means that more edge information (and possibly more texture or noise information as well) will be brought out in the final effect.

Equalizer



Example Image #1.



Example Image #2.

Multiband spatial frequency filter. Octave 0 refers to the highest spatial frequency band (or smallest spatial extent). Octave 3 refers to the lowest spatial frequency band (or largest spatial extent). Depending on how the controls are adjusted could be used as a blur or as an enhancement effect.

Octave 0

Amplitude adjustment for spatial frequency octave 0.

Octave 1

Amplitude adjustment for spatial frequency octave 1.

Octave 2

Amplitude adjustment for spatial frequency octave 2.

Octave 3

Amplitude adjustment for spatial frequency octave 3.

ColorSpace

The colorspace the filtering is performed in.

Fixed Color



Example Image #1.



Example Image #2.

Generates a fixed color field.

Can be applied to all or a subset of the components of a particular color representation or Color Space.

Can be used in movie effects to produce transitional fades to a fixed color background.
Can also be used to decrease color saturation or transform a color image into a grayscale image.

Fixed Color

The fixed color to fill with.

Color Space

The color space the operation is performed in.

Combination

Specifies options for which colorspace components are processed.

Fixed Image



Example Image #1.



Example Image #2.

Passes through the Ip Source unprocessed.

Can be applied to all or a subset of the components of a particular color representation or Color Space.

Can be used as a way to route images between different Canvas Layers in a PASEq.
Can also be used to mix the Source Image or a specified Layer with the Current Painted Canvas Image to generate a more subtle paint effect.

Can also be used with the Replace Even Field or the Replace Odd Field Effect Composite options to recombine 2 separate full frame field images into one interlaced image.

Color Space

The color space the operation is performed in.

Combination

Specifies options for which colorspace components are processed.

Flat Region Colorize

Example images are not applicable.

Used to recolor an image that already consists of flat colored of black and white regions. Avoid using this operation on complex continuous tone sources since its designed to work with flat region images only. Can be used to generate a large number of cartoon style effects, or to take a black and white thresholded image and turn it into colorized regions.

Min Size Prune

The minimum pixel size of an output region. Any regions with a smaller number of pixels are combined with an adjacent region.

Thin Prune

Prunes thin regions if turned on.

Propagation

Specifies constraints on adjacent pixel movements used to determine the region boundaries.

Color Space

Specifies the color space the recolorization operations are performed in.

Color Source

Specifies the source of the color used for region colorization.

Variation

Determines how the colors of the recolorization are generated based on the specified color source.

Fracture



Example Image #1.



Example Image #2.

Generates a series of random symmetry fractures of the Ip Source Image. Typically used as a somewhat extreme stylistic effect.

Number of Random Starts

The number of random fractures generated in the operation.

Algorithm

The particular fracture algorithm.

Option

Specifies various color space channel options the operation is performed in.

Mode

Specifies the type of symmetry associated with the fracture.

Fracture Displacement



Example Image #1.



Example Image #2.

Generates a series of random area fractures of the Ip Source 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.

Smooth

Smooths displacement if turned on.

Geodesic Displacement



Example Image #1.



Example Image #2.

Generates a geodesic area sampling of the Ip Source image. Each generated local area is then randomly displaced.

Great for shatter style effects.

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.

Displace Option

Determines how the displacement is calculated.

Dir Angle

Angle used for directional displacement.

Dispersion

Dispersion used for directional displacement.

Geodesic Falloff



Example Image not applicable.

Example Image #2.

Interpolates the Ip Source image to fill in a background fixed color area.

Useful to fill in white space left after a series of Paint Actions. Works best with hard paint stroke edges. Also can be used to create interesting gradient special effects

Size

The size in pixels of one falloff cycle. This will be the spacing of gradient effects.

Phase Shift

The phase shift of the falloff cycle.

Background

Specifies the solid color background that is filled in with the effect.

Algorithm

Choose interpolation of the solid color background vs a falloff gradient effect for the fill.

Distance Option

How distance for falloff is computed.

Kernel

The spatial kernel used for the falloff calculation.

Geodesic Filter



Example Image #1.



Example Image #2.

Generates a geodesic area filtering of the Ip Source image.

Start Algorithm

The sampling algorithm used to generate the start points.

Number of Random Starts

The number of random starts in the operation.

Random Count

Geodesic random count.

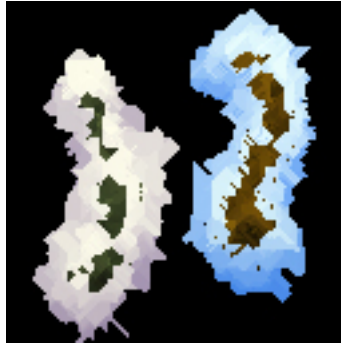
Fill Option

The particular filtering algorithm used to determine the coloring of the geodesic regions.

Geodesic FX



Example Image #1.



Example Image #2.

Generates a geodesic special stylistic effect.

Number of Starts

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

Random Count

Geodesic random count.

Iterations

The number of iterations run in the effect.

Geodesic Growth



Example Image #1.



Example Image #2.

Generates a geodesic area sampling of the Ip Source, and then fills that area with the sampled source color.

Number of Iterations

The number of iterations in the operation.

Start Algorithm

The sampling algorithm used to generate the start points.

Number of Random Starts

The number of random starts in each iteration.

Random Count

Geodesic random count.

Random Option

Colorspace randomization option.

Random Amount

Color randomization amount.

Geodesic Interpolation



Image #1 not applicable.

Example Image #2.

Interpolates the Ip Source image to fill in a background fixed color area.

Useful to fill in white space left after a series of Paint Actions. Works best with hard paint stroke edges. Does not work well with anti-aliased paint stroke edges.

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 with interpolated values.

Propagate

Option for the pixel neighborhood sampling algorithm..

Recombine

Specifies how the algorithm recombines pixels.

Fields

Specifies how the algorithm processes the color field information.

Geodesic Recursive Growth



Example Image #1.



Example Image #2.

Generates a geodesic area sampling of the Ip Source, and then fills that area with the a recursively modulated source color. Good for a soft diffusion or feathering effect.

Algorithm

Specifies the specific recursive growth algorithm used.

Start Algorithm

The sampling algorithm used to generate the start points.

Number of Iterations

The number of iterations in the operation.

Number of Random Starts

The number of random starts in each iteration.

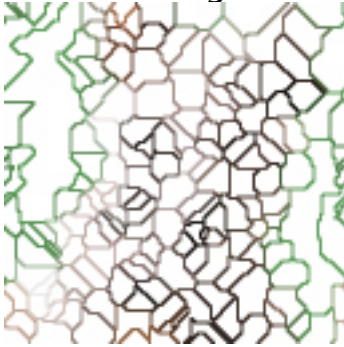
Random Count

Geodesic random count.

Recursive Feedback

Amount of recursive feedback.

Geodesic Rings



Example Image #1.



Example Image #2.

Generates a geodesic area sampling of the Ip Source image, and then fills that area boundaries with a sampled source color to generate colored rings.

Typically used as an extreme stylistic effect. Can also be used with one of the interpolation effects like Sparse Interpolation or Geodesic Variator in a second processing pass to refill the white canvas with color bleed from the rings.

Start Algorithm

The sampling algorithm used to generate the start points.

Number of Random Starts

The number of random starts in one iteration.

Number of Iterations

The number of iterations.

Option

Effect output options.

Geodesic Variator



Image #1 not applicable.

Example Image #2.

Interpolates the Ip Source image to fill in a fixed color background area. Typically used for more of a feathering effect that partially fills the background. Contrast the feathered visual appearance of this interpolation effect with Geodesic Interpolation or Sparse Interpolation that fill the entire canvas in one processing pass.

Alpha

The recursive mix.

Number of Iterations

The number of iterations.

Random Count

Geodesic random count.

Background

The background to be filled.

Blend Option

What the operation does to the background.

Source Mix

Option to mix the interpolated value with the existing input image value.

Propagation

Specifies the type of neighboring pixel propagation used.

Colorspace

Specifies the color space used for processing.

Geodesic Warper



Example Image #1.



Example Image #2.

Performs a geodesic warp from an automatically generated edge rendition of the image.

Good for generating a visual appearance that looks like melting or liquid flow.

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.

Number of Iterations

The number of iterations in the operation.

ColorSpace

Specifies the colorspace the operation is performed in.

Effect

Specifies the specific geodesic warp algorithm used for the effect.

Gradient



Example Image #1.



Example Image #2.

Generates a gradient image based on the Ip Source image.

Can be used to generate a 3-dimensional appearance or as a way to generate nonlinear edge or sketch effects.

Angle

The angle of the lighting source.

Elevation

The elevation of the lighting source

Width

The width of the effect.

Scale

The spatial scale of the effect.

ColorSpace

What colorspace the operation is performed in.

Variation

Specifies the type of gradient. Some of these options specify nonlinear orientation

effects or angle modulation based on the specified visual attribute.

Gradient Lighting



Example Image #1.



Example Image #2.

Generates a 3D gradient lighting effect derived from the Ip Source image.

Angle

The angle of the lighting source.

Elevation

The elevation of the lighting source

Width

The width of the effect.

Specularity

The amount of specular reflection in the lighting calculation.

Scale

The spatial scale of the effect.

Process

What specific type of lighting calculation.

Variation

Specifies the type of gradient. Some of these options specify nonlinear orientation effects or angle modulation based on the specified visual attribute

Color Source

Specifies alternatives for the source color used for the lighting effect.

Hue Shift



Example Image #1.



Example Image #2.

Allows circular offset adjustment of the color hue of the current Ip Source image.

Variation

Specifies type of hue shift.

Hue Shift

Specifies the amount of hue offset.

Image Compressor



Example Image #1.



Example Image #2.

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

Used as a way to automatically enhance an image.

Local Adaption

Specifies the amount of local adaption. Increasing this value brings out more detail. At some point it may also start to enhance noise in the image depending on the particular image processed.

Gain

Specifies the amount of nonlinear grayscale adjustment. 50% equals no change.

Bias

Specifies the amount of nonlinear grayscale adjustment. 50% equals no change.

Mode

Additional colorspace attribute options for processing.

Invert



Example Image #1.



Example Image #2.

Inverts the Ip Source image.

Can be applied to all or a subset of the components of a particular color representation or Color Space.

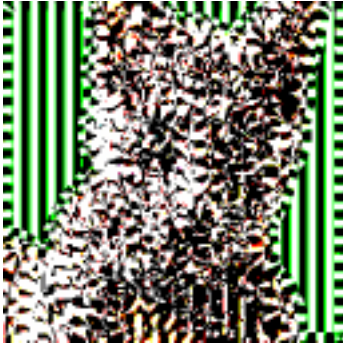
ColorSpace

Specifies the colorspace the operation is performed in.

Combination

Specifies options for which colorspace components are processed.

Line Screen



Example Image #1.



Example Image #2.

Smart line screen algorithm. Can be used to simulate traditional techniques like wood cut or engravings as well as to generate more extreme wild stylistic effects.

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.

Line Screen Dual



Example Image #1.



Example Image #2.

Smart line screen algorithm that uses 2 different frequency screens simultaneously. Can be used to simulate traditional techniques like wood cut or engravings as well as to generate more extreme wild stylistic effects.

Screen Size 1

Specifies the size of the first screen to be modulated.

Modulation Offset 1

Specifies an angle offset for the first modulator.

Screen Size 2

Specifies the size of the second screen to be modulated.

Modulation Offset 2

Specifies an angle offset for the second modulator.

Thres Adj

Offset adjustment for the thresholding.

Mod Source

Specifies the modulator source.

Variation
Colorspace variation for processing.

Line Screen Dual1

Example Image #1.

Example Image #2.

Smart line screen algorithm that uses 2 different frequency screens simultaneously. Can be used to simulate traditional techniques like wood cut or engravings as well as to generate more extreme wild stylistic effects.

Screen Size 1

Specifies the size of the first screen to be modulated.

Modulation Offset 1

Specifies an angle offset for the first modulator.

Screen Size 2

Specifies the size of the second screen to be modulated.

Modulation Offset 2

Specifies an angle offset for the second modulator.

Thres Adj

Offset adjustment for the thresholding.

Soft Ramp

Specifies a size for the soft ramp if that algorithm is used.

LA

Specifies the amount of local adaption if an LA algorithm is active.

Mod Source

Specifies the modulator source.

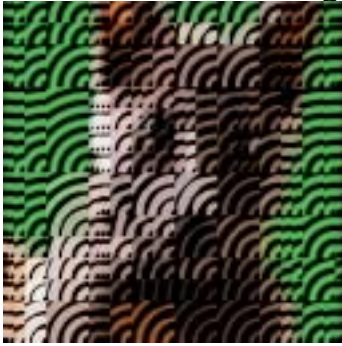
Variation

Colorspace variation for processing.

Algorithm

Specifies thresholding algorithm used for the effect.

Line Screen Block Regionize



Example Image #1.



Example Image #2.

Smart line screen algorithm that intelligently regionizes input and then independently screens each rectangular block area region. Can be used to simulate traditional techniques like wood cut or engravings as well as to generate more extreme wild stylistic effects.

of Horz Blocks

Number of horizontal blocks.

of Vert Blocks

Number of vertical blocks.

Screen Size

Specifies the size of the screen in pixels.

Modulation Offset

Specifies an offset value for the screen phase modulation in degrees.

Block Type

Specifies how the adaptive blocks are generated.

Split Option

Specifies split option for the generated blocks.

Colorspace

Specifies the kind of color screen processing.

Screen

Specifies the kind of screen algorithm used for the effect.

Variation

Specifies an output coloring variation for the effect.

Line Screen Regionize



Example Image #1.



Example Image #2.

Smart line screen algorithm that intelligently regionizes input and then independently screens each region. Can be used to simulate traditional techniques like wood cut or engravings as well as to generate more extreme wild stylistic effects.

Number of Colors

Controls the regionization process. Increasing this number increases the number of regions generated from the Ip Source

Min Size Prune

Specifies the minimum number of pixels needed for a region. Use this parameter to remove small noisy regions.

Colorspace

Specifies the kind of color screen processing.

Screen

Specifies the kind of screen algorithm used for the effect.

Screen Size

Specifies the size of the screen in pixels.

Modulation Offset

Specifies an offset value for the screen phase modulation in degrees.

Variation

Specifies an output coloring variation for the effect.

Morphol



Example Image #1.



Example Image #2.

A number of different localized nonlinear morphological operations.

Depending on the algorithm settings, this effect can do many different things. Can be used to generate edge effects, darken or lighten via edge growth, generate stained glass-like effects, and enhance or deblur images.

Algorithm

Specifies a particular morphological algorithm.

ColorSpace

Specifies the colorspace the operation is performed in.

Morpholizer



Example Image #1.



Example Image #2.

Enhanced version of the original Morphol effect. Can be used to define a number of different nonlinear morphological operations.

Depending on the algorithm settings, this effect can do many different things. Can be used to generate edge effects, darken or lighten via edge growth, generate stained glass-like effects, and enhance or deblur images.

Algorithm

Specifies a particular morphological algorithm.

ColorSpace

Specifies the colorspace the operation is performed in.

Kernal

Specifies the kind of local area used for the computation.

Smoothing

Spatial smoothing factor for local algorithm control.

Nonlinear Spread

Specifies a localized spatial area for computing the nonlinear effect.

Nonlinear Smoothing

Spatial smoothing for the nonlinear control signals.

Process Smoothing

Spatial smoothing factor for the output of the morphological process.

Oil Painter



Example Image #1.



Example Image #2.

A stylistic special effect that give a particular oil paint look to the Ip Source 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 Count

Geodesic random count.

Random Block Exchange



Example Image #1.



Example Image #2.

Randomly exchanges area blocks within the Ip Source image.

Can be used as fun special effect when combined with different compositing options.

Can also be used at more extreme settings to generate color texture fields.

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.

Exchange

Specifies options for block generation algorithm.

BlockType

Specifies type of block used for exchange.

Rank Area Filter



Example Image #1.



Example Image #2.

Allows for the application of a number of different nonlinear rank 2-dimensional area filters to the Ip Source image.

Size

Specifies the spatial extent of the rank filter.

Algorithm

Specifies the particular rank filter algorithm used in the operation.

ColorSpace

Specifies the colorspace the operation is performed in.

Combination

Specifies the particular colorspace components used for filtering.

Shape

Specifies the kind of local area used for the computation.

Rank Edge Filter



Example Image #1.



Example Image #2.

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 Ip Source 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.

Shape

Specifies the kind of local area used for the processing if an area processing ranktype is specified.

Variation

Specifies different variations of the effect.

Rank Falloff Filter



Example Image #1.



Example Image #2.

Nonlinear filter based on a geodesic falloff calculation.

Size

Specifies the spatial extent of the falloff filter.

Orient Offset

Specifies the angle offset for the falloff calculation.

Algorithm

Specifies the particular rank filter algorithm used in the operation.

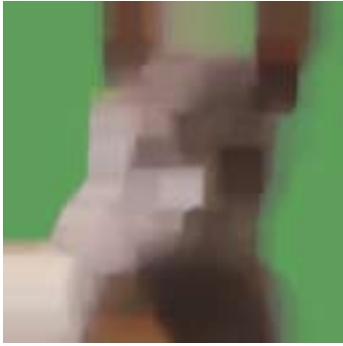
Option

Specifies an option for the falloff filter calculation.

Kernel

Specifies the spatial kernel used for the falloff calculation.

Rank Line Filter



Example Image #1.



Example Image #2.

Allows for the application of a number of different nonlinear rank 1-dimensional line filters to the Ip Source 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.

Combination

Specifies the particular color channel combinations that are filtered.

Rank Multiscale Filter



Example Image #1.



Example Image #2.

Allows for the application of a number of different nonlinear multiscale filters to the Ip Source image. A wide range of different stylistic effects are possible depending on the specific effect parameters.

Multiscale means the algorithm works at multiple frequency scales spaced an octave apart. Use the H and V adj values to introduce a spatial bias to the processing. Increasing above 100% can introduce spatial jitter into the octave processing. Decreasing one value from 100% while leaving the other at 100% allows for a spatially oriented kernel. For example, set H adj to 100% and V adj to 25 % for a rectangular kernel that tracks the angle modulation.

Horz Adjust

Specifies the horizontal octave spacing in percent.

Vert Adjust

Specifies the vertical octave spacing in percent.

Octaves

Specifies the number of octaves of processing.

Algorithm

Specifies the specific rank algorithm used for processing each octave.

Modulation

Specifies a source for angle modulation for the rank algorithm processing.

Mod Angle Offset

Specifies an angle offset in degrees for the algorithm processing.

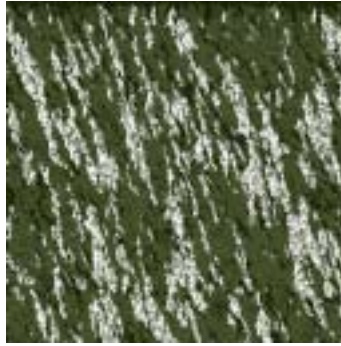
Octave Composite

Specifies a specific compositing algorithm used for compositing each processed octave with the previously processed octave image.

Resynthesis



Example Image #1.



Example Image #2.

Generates an abstract uniform texture field from the specified sub area of the Ip Source.

BlockSize

Specifies the size of the sub-block area used as the seed for the texture resynthesis.

H Offset

Specifies the horizontal offset of the sub-block area as a percent of the total source size.

V Offset

Specifies the vertical offset of the sub-block area as a percent of the total source size.

Algorithm

Specifies the texture resynthesis algorithm used. They all look different, try them out.

Selective Color Map



Example Image #1.



Example Image #2.

Maps a specified start color in the Ip Source image to a different specified destination color. The first Source color memory (left-most of the four) is used as the specified start color. The second Source Color Memory (2nd from left) is used as the specified destination color.

Tolerance

Adjusts the sensitivity or tightness of the source color selection.

Transition

Specifies the fade value range extent between the mapped output color and the original Ip Source.

Variation

Specifies the color space attributes used to determine the mapping.

Selective Color Matte



Example Image #1.



Example Image #2.

Generates a black and white selection matte from the Ip Source based on a specified color or set of colors. The Source control specifies what the source color or set of source colors are generated from.

Tolerance

Adjusts the sensitivity or tightness of the source color selection.

Transition

Specifies the fade value range extent between the mapped output color and the original Ip Source.

Variation

Specifies the color space attributes used to determine the mapping.

Source

Specifies the color source used to generate the matte.

Chapter 5: Texture 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 effects or unique abstract images.

Resolution independent abstract texture fields and texture based effects can be generated in the Texture Synthesizer. The Texture Synthesizer provides an alternative to manual or automatic painting that uses the Paint Synthesizer. However, it can also be used in conjunction with the Paint Synthesizer as a background texture generator option.

The Texture Synthesizer can be used to process an existing image with a texture based effect. Or, it can be used to generate abstract static or dynamic imagery that can be used as the starting point or end result for building a final abstract artistic image. It can also be used as an active modulator in many Image Processing Operations.

This overview will help you understand the structure of the Texture Synthesizer so that you can quickly start modifying preset patches as well as create your own.

Introduction

The Texture Synthesizer allows for an unlimited number of resolution independent texture based effects. These visual effects could be anything from displaying the generated texture field directly in the Canvas as abstract imagery to complex nonlinear image processing operations and special effects spatially controlled by the generated texture field.

Extensive modulation options are available to increase the visual richness of the resulting effects. Most Texture Synthesizer settings are also designed to self modulate, so running the effect for several iterations on itself will result in increased visual complexity.

Overview of the Texture Synthesizer

Concept

The Texture 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 an image. Properties of one signal could be effecting the generation or processing of another. The Texture Synthesizer is a flexible and configurable environment for constructing visually rich texture based effects and an unlimited variety of abstract imagery.

The texture themselves are procedural or mathematical in nature as opposed to being derived from raster images. They also have fractal properties. The combination of

these two characteristics means that unlike raster texture images the procedural textures are resolution independent, and can be scaled in resolution while increasing in detail.

Texture Synthesizer Editable Control Panes

The Texture 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 Texture Synthesizer's generation and processing engine. These parameters define the visual look and feel of the resulting resolution independent texture field and associated visual effect.

The Texture Synthesizer parameter panes are organized as follows:

Spatial

Determines the spatial characteristics of the generated texture field.

Generator

Determines the algorithms used to generate the resulting texture field.

Mapping

Primarily defines a grayscale mapping associated with the generated texture field.

Effect

Determines how the generated texture field is used to generate a final image or texture based visual effect.

Output

Allows for generic Ip Op style mix and composite controls.

A small texture preview image is located below the editable control panels that provides an interactive preview of the generated texture field that the various Texture Synthesizer effects are based on. Adjusting a slider will change the preview image in real time. The preview is currently of a small portion of the texture field as opposed to the total texture-based effect.

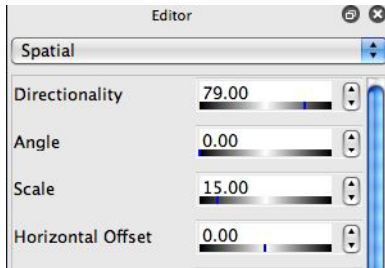
Using Color Palettes and Gradients

Prior to version 3.5 the texture synthesizer's behavior with integral color palettes and color gradients was somewhat erratic. Color palettes always played back whether you wanted that to happen or not, while color gradients did not.

There are now specific Effect Type options that save or do not save the color gradient. There are also specific Color Processing options to save or not save the color palette. These new options give you much more control over using the texture synthesizer in Paint Action Sequences.

If you save the color palette or color gradient, you can recreate a specific coloring effects designed with a specific color palette or color gradient. If you use the options that do not save, then you can design PASEqs that first generate a color palette from a source image and then use that palette in the texture synthesizer. These PASEqs will always have unique colorings based on the source image or movie being processed by the PASEq.

Spatial Parameters



The Spatial parameters define the spatial characteristics of the generated texture field. These include scale, angular orientation, and directionality as well as spatial field and depth positioning. Many of the individual parameters can also be modulated as well.

Directionality

Determines the degree of isotropy or directionality of the generated texture field.

Angle

Determines the angular orientation of the generated texture field.

Scale

Determines the spatial scale of the generated texture field.

Vertical Offset

Determines the vertical positioning of the generated texture field.

Horizontal Offset

Determines the horizontal positioning of the generated texture field.

Depth Offset

Determines the depth positioning of the generated texture field.

Depth Mod

Determines the depth modulation of the generated texture field. Parameters include the modulator source signal and the percent modulation.

Angle Mod

Determines the angular modulation of the generated texture field. Parameters include the modulator source signal and the percent modulation.

Horz Mod

Determines the horizontal position modulation of the generated texture field. Parameters include the modulator source signal and the percent modulation.

Vert Mod

Determines the vertical position modulation of the generated texture field. Parameters include the modulator source signal and the percent modulation.

Depth Mod Src

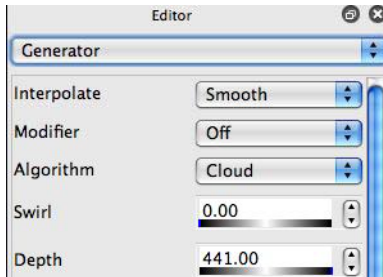
Angle Mod Src

Horz Mod Src

Vert Mod Src

Determines source used to modulate the labeled parameter.

Generator Parameters



The Generator parameters determine the specifics of the algorithms used to generate the texture field. There are 3 modules that work together to define the Texture Generator. A specified algorithm is used to derive the fractal texture field. The algorithm uses a specified interpolator module. A modifier module may be inserted as an additional process for each generated spatial octave of fractal texture.

The texture field itself is fractal in nature. This means that it is composed of energy over several different spatial frequencies called octaves. Controls are available to specify the fractal octave depth, ratio, and fall off used by the specified texture generation algorithm. Some texture generation algorithms or interpolators may use additional skew, frequency variation, and amplitude variation controls.

Interpolate

Determines the interpolation algorithm used for texture synthesis.

Modifier

Determines an inline modifier algorithm that processes each spatial octave of the generated texture field.

Algorithm

Determines the particular algorithm used for spatial octave texture generation.

Swirl

Determines the two-dimensional spatial swirl factor for the generated texture field.

Depth

Determines the fractal depth of the generated texture field in octave percentage.

Ratio

Determines the percent ration between subsequent spatial octaves in the generated texture field.

Falloff

Determines the percent energy falloff between subsequent spatial octaves in the generated texture field.

Seed

Determines the random seed used in the texture generation algorithm.

Mod Amount

Determines the amount of additional modulation in the texture synthesis algorithm.

Skew

Determines the skew of the generated texture field.

Freq Var

Determines the frequency variation in the generated texture field.

Amp Var

Determines the amplitude variation in the generated texture field.

Seed

Determines additional options associated with the seed used in the texture generation algorithm.

Depth Mod

Determines the fractal depth modulation of the generated texture field. Parameters include the modulator source signal and the percent modulation.

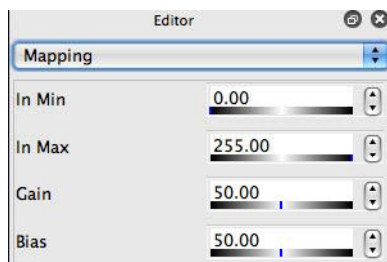
Ratio Mod

Determines the fractal ratio modulation of the generated texture field. Parameters include the modulator source signal and the percent modulation.

Falloff Mod

Determines the fractal octave falloff modulation of the generated texture field. Parameters include the modulator source signal and the percent modulation.

Mapping Parameters



The Mapping parameters define a nonlinear grayscale mapping transformation that processes the generated texture field before it is applied to the effect module. Some additional parameters associated with spatial coordinate mapping are also specified here as well.

In Min

Determines the minimum grayscale value for the mapping transformation.

In Max

Determines the maximum input value for the mapping transformation.

Bias

Determines the nonlinear bias associated with the nonlinear mapping.

Gain

Determines the nonlinear gain associated with the nonlinear mapping.

Out Min

Determines the minimum output value produced by the mapping transformation.

Out Max

Determines the maximum output value produced by the mapping transformation.

Bus 1,2

Specifies a particular layer for use as a bus routing modulator in other places in the texture synthesizer.

Warp

Specifies whether affine mapping warping is turned on or turned off.

Horizontal Multiplier

Determines a horizontal coordinate warp mapping for the initial spatial texture generation. Any setting not zero is introducing an affine transform to the generated texture field if warp is turned on.

Vertical Multiplier

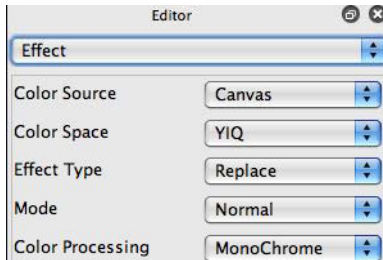
Determines a vertical coordinate warp mapping for the initial spatial texture generation. Any setting not zero is introducing an affine transform to the generated texture field if warp is turned on.

Scaling

The Texture Synthesizer generates resolution independent textures and texture based effects. This means that for a given set of parameter settings, the texture field will scale appropriately as the Canvas size increases or decreases. This behavior would be the typical use of the Texture Synthesizer and occurs when this control is set to Relative.

However, there may be situations where you would like the texture field to remain static as the Canvas size changes. Setting the Scaling to Absolute turns off the resolution independence and the texture scaling remains static as the Canvas size changes.

Effect Parameters



The Effect parameters determine how the generated texture field is applied to the Canvas or used to generate a texture based effect.

Effect Type

Determines how the generated texture field is applied to the Canvas or used in a texture based effect. Depending on which effect type is specified additional controls may appear that are detailed below.

Displace Amt

Determines the amount of displacement in a displacement based effect or the spatial kernel dimension ins a directional kernel based effect.

Displace Angle

Determines the angle of displacement in an angular displacement based effect. If there is an angle modulator specified then this parameter is an angular offset.

Displace Amt Mod

Determines the displacement modulation of the generated effect. Parameters include the modulator source signal and the percent modulation.

Displace Angle Mod

Determines the angular modulation of the generated effect. Parameters include the

modulator source signal and the percent modulation

Color Source

Determines the color source for the final effect.

Color Proc

Determines which color texture synthesis algorithm is used for the effect.

Color Space

Determines the color space the effect is generated in.

Mode

Determines any auto-regionization associated with the effect.

Seed Option

Determines options for random seed generation in each repetition cycle.

Chapter 6: Vectorizer



The Vectorizer is a unique artistic raster image to vector region convertor that allows for a wide range of creative special effects.

Vector regions are resolution independent and can be output as eps files for smooth printing on any resolution color printer that support postscript level 2 or greater printing. They can also be directly imported into vector illustration ,page layout, or web design programs.

The Vectorizer can also generate Bezier regions that are recorded in the current layer's Bezier path frame. These Bezier regions can then be filled using Paint Synthesizer Region Fill as Brush presets. This allows for more expressive and organic region paint effects by re-rasterizing the flat color vector regions using the full power of the Paint Synthesizer.

Movies can be processed frame by frame using Vectorizer action steps in a Paint Action Sequence. Region special effects are also available that create stylized vector aesthetics that can emulate hand drawn or 50's mod style or abstract cubist imagery automatically derived from your source image with no tedious hand drawing needed.

The full power of the Vectorizer is also available within the Paint Synthesizer when outputting painted imagery to eps either as single eps images or numbered eps frames if outputting animation or processed video. This allows you to use the complete power of the Paint Synthesizer and its automatic paint stroke generation to create resolution independent vector paint strokes directly in an eps file. Whether you are printing to high resolution printers or generating animation at film resolutions, the Vectorizer opens up a wide range of new creative possibilities within Studio Artist.

This overview will help you understand the structure of the Vectorizer so that you can quickly start modifying preset patches as well as create your own.

Introduction

The Vectorizer takes a raster source image composed of pixels and converts it into a resolution independent vector region representation based on Bezier spline curves.

Unlike other raster to vector convertors you may have used in postscript illustration programs, the Vectorizer is designed to give you extensive control over the complete raster to vector conversion process. A large number of editable parameters are available to allow you to tailor the vector conversion process to create a wide variety of artistic special effects as well as to utilize more straightforward realistic raster to vector conversion capabilities.

The Vectorizer is also available as an eps postprocessing option in the Studio Artist Paint Synthesizer when generating eps file output from Paint Action Sequence recordings of painting and drawing in either still images or processed movie files. This means you can use the Paint Synthesizer itself to generate resolution independent vector paint strokes composed of smooth scalable vector regions for either large format printing of still images or to generate eps frames for conversion to Flash movies or for output at film resolutions.

Overview of the Vectorizer

Concept

The Vectorizer starts with a selectable raster source image and then converts the raster image into a set of flat colored vector regions that best represent the raster source image. Filtering options are provided to clean up either the raster image prior to the conversion process and/or to clean up the resulting vector regions after the conversion process.

There are a number of different editable parameters that allow you to choose different vector conversion algorithms that have been tailored for maintaining accuracy and realism in the conversion process or for achieving different artistic vector special

effects. Specifics of the different control panels and their associated editable parameters are detailed in the next sections.

Vectorizer Editable Control Panes

The Vectorizer 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 Vectorizer's raster to vector conversion, processing, and coloring engine. These parameters define the visual look and feel of the resulting raster to vector region conversion as well as specifics related to how eps files store the vector information for subsequent printing or importing into other vector illustration programs.

The Vectorizer parameter panes are organized as follows:

Generation

Determines the specific details of the raster to vector region conversion algorithm.

This includes the Source of the raster image that will be used for vector conversion, Filtering options that can reduce noise or vector artifacts, a number of different conversion Techniques tailored for different applications, and the particular Generation algorithm used for the raster to vector conversion within a specific technique.

Most of these sections have a number of different internal parameters available for editing to customize your own presets.

Drawing

Determines details related to the encoding of the vector region, it's coloring and eps vector output encoding.

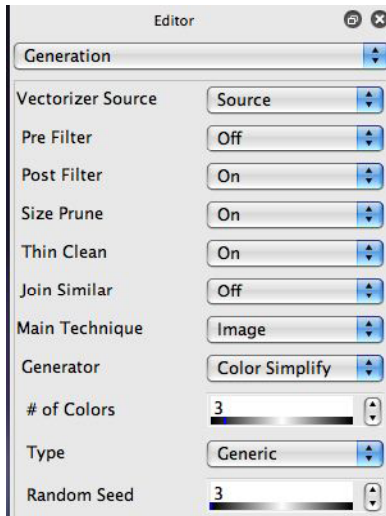
This includes special stylized Region Effects, the details of how the color for the region fill is generated, as well as internal details concerning how the vector information is written out to an eps file.

You can also specify an alternative coloring for an optional vector stroke in the eps section to use as an outline around a region.

Composite

Allows for generic Ip Op style compositing and mix controls that determine how the generated vectorizer output is composited back into the current layer.

Generation



The Vectorizer Generation parameter pane is used to specify the specifics of the artistic raster image to vector region conversion process. There are four different main techniques, which are Image, Shape, Outline, and Flat Input.

The Image technique is the best for generating cartoon style output, or realistic vector representations. The Shape technique generates a more stylized or abstract representation based on simple geometric shapes as regions. The Outline technique is used to overlay solid colored vector regions that represent edges or outline boundaries only.

The Flat Input technique is used where you already have a raster image consisting of only flat colored regions that you wish to convert into an accurate vector representation using the existing flat colored areas as the region boundaries.

Vectorizer Source

Determines the source routing for the particular raster image that will be used as the

input for the vectorization process. Currently this can be either the Source Image or the Current Layer.

Source Filtering Options

There are a number of different image filtering options that can be applied pre or post raster to vector conversion. These options can be used to clean up or smooth out image noise before the raster image is converted to vector regions, or to clean up small vector regions or very thin vector boundaries from appearing in the final vector region output.

Pre Filter

Determines noise filtering options applied to the raster source image prior to the color region conversion.

Post Filter

Determines noise filtering options after the color region conversion.

Size Prune

Size pruning removes small vector regions from the final output if turned on. Small regions are joined into neighboring larger regions.

Thin Clean

Thin cleaning removes very thin portions of the vector region edge boundary if turned on. Thin region edge outliers are removed and joined into a thicker neighboring region.

Join Similar

Joins adjacent regions with similar coloring if turned on.

As more noise filtering options are turned on, a smoother vector region representation is generated. However, smoother overall regions means that small or fine detail in the original source image may be lost in the final vector output.

When working with certain Outline Generators you may want to turn off filtering

completely or reduce its effect to preserve the fine edge detail you want to represent with vector regions.

This is especially true with the Flat Input technique. Typically you would always turn off the filtering options when using this technique so that you do not modify the already flat raster regions in any way to accurately reproduce them in the final vector output.

Main Technique

Determines the overall approach used for the artistic raster to vector conversion process. There are four main techniques which are called Image, Shape, Outline, and Flat Input. Typically they all have different uses. Each technique also has a unique set of internal parameters. Detailed information about the four techniques is provided below.

Image Technique



The Vectorizer Image technique starts with a raster source image and generates a series of vector regions that best represent the source image based on the particular raster to vector generation method chosen using the parameters below. Many different artistic styles can be generated depending on the specific Generator chosen and how its internal parameters are adjusted.

The Image technique is great at achieving a cartoon look where a raster image is represented using a small set of flat vector regions. There also are also a wide range of artistic special effects that can be generated using the different Generators and internal settings provided.

The image technique will cover the entire canvas with vector regions.

Generator

Specific raster to vector image processing algorithm used in the vector region generation process. Each one has a very different overall aesthetic look.

Generator Specific Parameters

of Colors

Determines the number of initial colors used for the simplification process. These colors are adaptively generated inside the generator and do not directly correspond to the number of specific different colors that will be generated in your output vector image.

Decreasing this parameter leads to a smaller number of larger regions that best represent the raster image. Increasing this parameter leads to more but smaller regions that better capture the raster image details.

Block Scan

Type of scan algorithm used to adaptively generate rectangular regions based on the Vectorizer Source. Changing the scan algorithm changes how the region blocks are positioned within the overall image.

H Block

Number of horizontal rectangular blocks.

V Block

Number of vertical rectangular blocks.

Complexity

Decreasing this parameter leads to larger block sizes. Increasing this parameter leads to a larger number of smaller block sizes that better represent the Source.

The exception to this is the Cellular generator, where decreasing leads to smaller cell sizes and increasing leads to larger cell sizes.

Type

Normal means the normal region generation processes is used. Adaptive Split will take each generated region and intelligently split it to better represent the source.

Start Alg

Determines the initial positioning for the geodesic growth algorithm. Each one has a different aesthetic look to the generated regions.

Random Start

Adjusts the number of random start locations for the geodesic growth generator. Increasing it leads to smaller regions that can provide better rendition of edge detail. Decreasing it leads to larger regions that simplify the overall image.

Random Ct

Random variator for the geodesic growth process. Setting this to a value other than 0 (typically 2) can break up straight region boundary artifacts associated with the geodesic generator.

Seed

The random seed is used to initialize the Vectorizer's internal random number generators. If the Vectorizer is always initialized to a specific seed value when run, then the results for a given input source image will always be the same. Different seed values will give different random outputs. The difference is typically not dramatic but within the overall style.

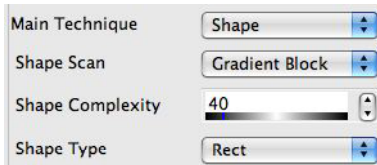
Some Vectorizer generators may not use randomization internally. However, there are also coloring options that utilize random generators that could be applied to a fixed generation process. All of the different internal random generators are controlled by the same interface seed.

Pos-Neg Adjust

An additional adjustment for the positive-negative space algorithms. Decreasing it

leads to more detail (and potentially more noise).

Shape Technique



The Vectorizer Shape technique starts with a raster source image and generates a series of simple geometric vector regions that are positioned to best represent the source image. The geometric shapes are typically simple ones like rectangles or ellipses. This technique is best for stylized uses rather than detailed or accurate raster to vector conversion.

The Shape technique can either cover the entire canvas with vector regions or provide partial cover on the existing canvas, depending on the internal parameters specified.

Scan

Type of scan algorithm used to adaptively generate rectangular regions based on the Vectorizer Source. Changing the scan algorithm changes how the region blocks are positioned within the overall image.

Complexity

Decreasing this parameter leads to larger block sizes. Increasing this parameter leads to a larger number of smaller block sizes that better represent the Source.

Shape Type

Specific kind of vector shape used to fill in the regions.

Outline Technique

Main Technique	Outline
Outline Type	Pos/Neg
Outline Option	Normal

The Vectorizer Outline technique starts with a raster source image and generates a series of solid colored regions that correspond to edge or outline structure. This technique does not cover the entire canvas with vector regions, only the edge or outline edge areas that are being represented.

One typical approach is to use the Image technique to generate a complete solid colored vector region representation of the original source image. Then, a second Vectorizer pass using the Outline technique can be used to add black edge outlines on top of the first colored vector region output. This allows you to generate a typical cartoon vector representation with colored solid regions and additional black outlines that enhance the original edge detail or positive and negative space in the final vector representation.

These combined steps can easily be recorded in a Paint Action Sequence and then referenced as a PASEq preset for a one step operation in the future.

Outline Type

Specific algorithm used to generate the outline regions. Changing this algorithm changes how the outline regions are generated as well as their associated visual appearance.

Option

Specific option associated with the outline generator algorithm. Changes some aspect of the visual appearance of the particular outline type.

Threshold

Specific luminance threshold value used in the edge outline generator. Adjusting this will change the amount of edge structure in the generated outline.

Range

Specifies the luminance range used to generate a contour outline, which changes the overall contour thickness.

Pos-Neg Adjust

An additional adjustment for the positive-negative space algorithms. Decreasing it leads to more detail (and potentially more noise).

Flat Input Technique



This technique is used to convert an existing flat color raster image into a vector representation. It assumes the raster input image is already composed of flat colored regions with no shading or noise. If the input is not a flat colored image then each pixel will potentially be converted into a vector region, which is not desirable.

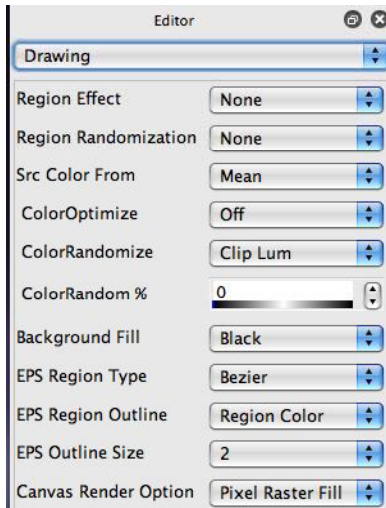
Flat Source

Allows for alternate source for the flat regions used to generate the vector representation. The Vectorizer Source is used for the coloring.

Vec Source means use the vectorizer source, which was the original way this technique worked. Canvas means use the current canvas as the source of the flat regions. Selection means use the current region selection as the source for the flat regions.

These last 2 options allow you to colorize the vectorized flat regions based on the current Vector source image (which could be a different non flat color image). So you could do things like build a segmentation mask image using various Ip Ops and then vectorize that segmentation mask with colored generated by mapping the vector regions into the source image

Drawing



The Vectorizer Drawing parameter pane provides specific editable parameters associated with details of how the vector regions are drawn. This includes a number of special effect options for the generated vector regions, how the colors for the individual regions are determined from the source image, and some internal details for the postscript eps file generation process.

Region Effects

Region Effect

Determines specific effect options that can be used when generating the Bezier regions in the final vector conversion process. These effect options can be used to create very interesting stylized vector representations.

Region Randomization

Allows for additional randomization applied to the region effect.

Random Amt (pixels)

Specifies the amount of randomization in pixels.

Random Effect

If region randomization is turned on then you also have the option of applying a second region effect to the output of the randomization process.

Region Coloring Options

Src Color From

Determines how the vector region color is generated from the source image. The different algorithm types specified here analyze the source image within the region area in different ways generating different colorings.

Some of these settings ignore the source image and use some color attribute from the Source area of the Studio Artist interface such as the current Fixed Color setting or the Source Palette.

Color Optimize

Allows for range optimizing the set of generated output colors if turned on.

Color Randomize

Determines the coloring details of any specified color randomization for the generated regions.

Color Random %

Determines a percent color randomization for the region color. How the color is randomized is determined by the Randomize setting mentioned above. Set this to 0 for no color randomization.

Adding randomization to regions can help to distinguish region boundaries better when closely colored regions are placed next to each other as well as to provide a wide variety of artistic special effects.

Background Fill

Specifies a flat color background that is drawn before the vector color regions are rendered. This can be useful when working with region effects since if they are turned on the regions may not overdraw the entire canvas.

You can also set this to none, which is useful for overlaying effected or outline regions on top of the existing canvas.

Outline Color Option

Specifies how the coloring of the Outline technique regions is generated. Make sure this is not the same as the Background Fill color (otherwise you will generate a solid colored canvas).

EPS Output Options

Region Type

Determines the specifics of the type of postscript region generated in an output eps file. Typically you would use the Bezier setting for generating smooth region boundaries.

Region Outline

Determines whether the eps region is outlined with an additional postscript stroke at the region boundary as well as specifics associated with the outline path color.

Typically an outline stroke is added to the vector region in the eps file as a form of region trapping to insure complete overlap coverage when printing or importing into other programs that use eps.

The outline stroke can also be used for special effects such as outlining a colored region with a thin smooth black stroke for enhanced region definition.

Outline Size

Determines the size of any added outline stroke in the eps file. Typically you need an Eps Outline size of 2 (possibly 3) for trapping to generate complete solid fill when rendering a fully covered vectorized eps file.

Render Options

Canvas Render Options

You can choose raster fill or anti-aliased vector drawing based on the eps settings for rendering the vectorizer effect in the current canvas layer.

The vector drawing option better represents what you will see if you output an eps file and render it in another program. Typically you need an Eps Outline size of 2 (possibly 3) to generate complete solid fill when rendering a fully covered vectorized eps file. The raster fill option always compensates for this and completely fills in the raster canvas.

The Smart Blur Ip Op is really useful for cleanup of any edge artifacts from either render option.

The following additional parameters are available when using the anti-aliased vector render option.

Vector Fill Blend %

Determines the transparency of the vector shape fill.

Vector Edge Blend %

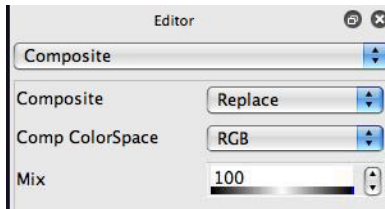
Determines the transparency of the vector shape outline fill.

Note that when these fill percents are less than 100% the outline will be accented since there is some partial overlap into the shape area.

Multiple applications of semi-transparent vector regions can be used to build up vector shapes that have a more complex or organic look than the typical flat colored region look created by the vectorizer. EPS vector output does not support transparent regions (they will be solid filled), but SVG vector output does support transparent regions.

So you could construct a PASEq with multiple vectorizer steps that all overlay semi-transparent vector shapes and generate a SVG vector file from the PASEq that looks just like what you see in the Studio Artist canvas but can be arbitrarily scaled.

Composite



The Vectorizer Composite parameter pane provides specific editable parameters associated with how the vectorized output is composited and mixed with the existing canvas. The standard Studio Artist compositing options are provided (like in image operations).

Composite

Specifies the type of compositing used to place the generated effect in the current canvas layer. A few of the settings actually correspond to alternate output routing options (to current selection or alpha buffers).

Comp ColorSpace

Specifies the color space and channel options used for compositing.

Mix

Determine the mix of the vectorizer effect with the current canvas layer.

Repetition

Determine the # of times the vectorizer internally repeats the processing. This can be useful if you are working with semi-transparent vector shapes and are using a generation technique that generates random shapes for each repetition.

Chapter 7: MSG

MSG stands for Modular Synthesized Graphics. MSG is Synthetik Software's preset-based modular effects and graphical synthesis architecture. MSG provides a way to infinitely expand the functionality of Studio Artist through collections of MSG presets.

Each MSG preset is composed of a series of individual processor objects. Processor objects perform some kind of image processing operation. There are an extremely large number of different processor objects, and they can be combined together to create an unlimited number of different image or video processing effects. They can also be used to generate static or dynamic abstract procedural imagery.

Studio Artist has the capability to use a MSG preset either in the Paint Synthesizer to extend its internal functionality or as a stand alone image processing or texture generation effect in the MSG Operation mode. Each MSG preset can have a number of editable parameters that adjust some aspect of its internal processing or overall visual appearance. These editable parameters can be user adjusted as well as keyframe animated in a Paint Action Sequence over time.

MSG preset parameters can also be dynamically controlled over time by internal temporal oscillators. This allows for procedural animation of the MSG effect without keyframing, which is a great automatic alternative to manual keyframing for generating dynamic visual animations.

This overview will help you understand the structure of the MSG Operation mode so that you can quickly start utilizing MSG presets in your creative work flow.

Introduction

MSG stands for Modular Synthesized Graphics. MSG is Synthetik Software's preset-based modular effects and graphical synthesis plug in architecture. MSG provides a user editable modular graphical synthesis foundation for expanding the functionality of existing and future Synthetik Software products.

MSG presets can be used for image processing or video special effects. A large number of individual modular image processing objects can be combined together to create an overall image or video processing effect. There are essentially an infinite number of different processing effects that can be created within MSG due to its flexible and expandable modular nature.

MSG presets can also be used as the basis for generating abstract static or dynamic algorithmic textural and fractal imagery. Again, the range of potential visual imagery MSG is capable of generating is essentially infinite in scope. Go boldly where no one has gone before as you manipulate MSG parameter space to create an unlimited variety of abstract resolution independent imagery.

Overview of MSG Processing

Concept

MSG presets consist of a number of different internal modular processor objects connected together to build a specific processing effect or algorithmic procedural image. These individual processing modules can either generate visual imagery from scratch or process or modify it in some way. The output of one processor module can be internally routed to another as either an input for processing or a modulator that controls some aspect of internal processing.

Inputs and outputs to MSG processors are specified as a list of individual Stream channels on an internal Bus. Each color field in a color image would be one individual Stream on the Bus. Typically color images are composed of 3 different color channels

or 3 different image Streams on the MSG Bus.

Users familiar with audio mixing boards will recognize analogies between how an audio mixing board is internally structured and the underlying MSG channel Stream and Bus structure. In an audio mixer, each channel is an audio signal, and multiple audio channels in the mixer are selectable from an internal audio bus.

In a MSG preset, visual images are represented as visual channels called Streams. All of the different potential image Streams are selectable from the internal MSG Bus. MSG Processors can have a number of potential input and output (IO) channels. Image Streams on the internal Bus can be routed to input channels for a Processor and output channels from a Processor can be routed back to image Streams on the internal Bus.

MSG Processors are ordered in a list called a Processor Chain. When a MSG effect is generated, the individual Processors in the Processor Chain are executed one by one in ordered sequence. Each processor accesses individual Streams on the internal Bus for its different image inputs and outputs.

Again, the audio mixer analogy of this would be a series of individual audio effect processors patched into individual audio channels on a mixing bus. Rather than audio effects working with audio signals, each MSG Processor is a visual effect that generates or processes spatial images.

Each internal processor can have a collection of editable user parameters.

Internal MSG processor parameters can also be associated with temporal oscillators called Temporal Generators. MSG Temporal Generators allows for parameter adjustment automatically over time in an animation or video sequence, and provide a procedural alternative to manually specified frame based parameter keyframing.

Temporal generators attached to individual editable parameters can also be associated with interactive modulators such as pen pressure, tilt, or tilt orientation to provide

immediate interactive adjustment of an overall MSG process. This can be very useful when using a MSG preset in the paint synthesizer.

In the past, a separate application program included with Studio Artist 3.5 called MSG Evolver was used to design and extensively edit MSG presets. Studio Artist 3.5 provided limited MSG preset editing via up to 6 user sliders defined with user slider temporal generators attached to individual parameters.

While you can still use MSG Evolver to edit version 3.5 MSG presets, most of the Evolver functionality is now built directly into Studio Artist 4. You have complete control in v4 over modifying all of the Processor Stream i/o routing options as well as the specifics of the individual Processors, all their editable parameters, and their ordering on the overall Processor Chain in the MSG Advanced Editor palette.

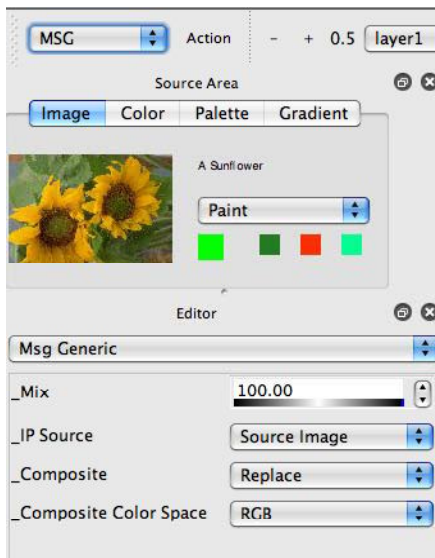
You also have access to the old MSG Evolver ability to use random directed evolution to adjust or build new MSG presets without needing to understand their internal structure. This can be done in Studio Artist 4 with the new MSG Evolution editor.

The initial release of Studio Artist 4 does not support the old 3.5 limited user slider functionality for MSG presets. That support may return in a future update.

Consult the MSG User Guide or the Studio Artist Tips web site at www.synthetik.com/tips/wordpress for more detailed information on building MSG Presets.

Specifics of the Studio Artist MSG control panels and their associated editable parameters are detailed in the next sections.

MSG Editor Panel



Currently there is only one MSG Editor control panel. The controls in this panel mirror the generic user controls seen in other operation modes like Ip Ops. They let you choose an IP Source as possible input to the MSG preset effect as well as provide the standard v4 compositing and mix controls.

The simple MSG user slider controls available in previous versions of Studio Artist are currently not available in v4. This may change in the future. You have complete access to all of the editable parameters in a MSG preset in the MSG Advanced Editor. MSG is unique in v4 in having a special specific advanced editor palette, as opposed to having all the user controls available in the standard generic Editor palette which is the case for the other operation modes.

The MSG generic editor pane is organized as follows:

IP Source

Determines the source routing of the raster image that will be used as the input to the

MSG preset. Currently you can choose the current layer or the source image as the source to be processed.

Be aware that a particular MSG preset may or may not use the specified source in its internal processing. Some MSG presets act as image processing or video effects but they can also be constructed to be stand alone algorithmic texture or fractal imagery generators that don't use a source image. By examining a MSG preset's bus streams and the individual processor IO routing you can determine if the IP source is being used in the preset or not.

Mix

The percent amount of mix between the output of the MSG effect's compositing operation and the original Current Canvas layer.

Composite

Specifies a compositing operation that takes the original Current Canvas Layer and the MSG effect output and algorithmically combines them in some specified fashion. The output of the compositing operation is then placed in the Current Canvas Layer at the completion of the MSG operation.

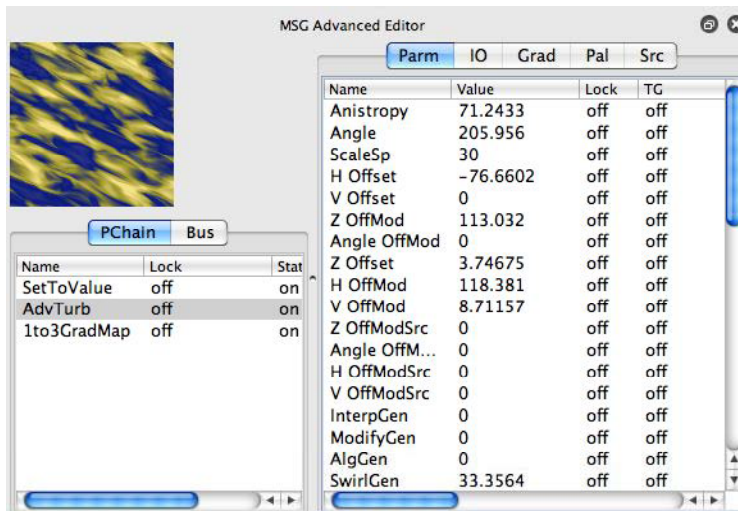
Different composite settings can completely change the overall appearance for any given MSG effect. For example, specifying an **Edge1** compositing operation on a MSG preset that blurs the Canvas image will generate a sharpening visual effect.

Certain composite settings will bypass the current Canvas Layer and place the MSG output in either the current layer's alpha channel or the current Selection Region.

Composite Color Space

Specifies an additional color space or channel for the compositing to take place in.

MSG Advanced Editor



The MSG Advanced Editor provides complete access to all of the editable parameters associated with a modular MSG preset. This includes the functionality of all of the old MSG Evolver editing palettes, including the Processor Chain Editor, Bus Stream Editor, Color Palette and Gradient Editors, and the Source Library. The new design incorporates all of those Evolver editing palettes into one compact MSG Advanced Editor palette that is directly built into Studio Artist v4.

MSG Preview

The MSG Preview (top left) displays a preview image of the current MSG preset you are editing. This preview image updates on the fly as you interactively edit the MSG preset.

You can also use hot keys along with mouse movement to perform some interactive edits directly in the preview image area. You hold down the hot key while mousing down in the preview area and then your mouse movement will adjust some editable

aspect of the preset. Interactive adjustment hot keys for the MSG preview area include the following:

't' - translate

'r' - rotate

'h' - scale

'cmd' - adjust selected parameter

The translate, rotate, and scale adjustments will be applied to all of the processors in the processor chain. If you hold down an additional shift modified key then they will only be applied to the current selected processor in the processor chain list.

Processor Chain and Bus Stream Lists

The bottom left side of MSG Advanced Editor contains a tabbed list that can display either the current Processor Chain editor list or the Bus Stream editor list.

The processor chain editor is a list of the individual modular processors used in the MSG preset. A MSG preset executes each processor in order from top to bottom in the list when the preset is run.

You can drag the individual processors around in the list to change their order in the processing chain. You can also drag to make a copy of an existing processor, and you can select and delete a processor using the delete key.

You can lock or mute individual processors in the list. Lock on means that random evolution will not affect any of the internal editable parameters associated with that processor. Turning off the status of a processor will effectively mute it, the processor will remain in the list but will not be used or active when the preset runs.

Processor Chain and Bus Stream Lists

The right side of the MSG Advanced Editor contains a large tabbed area that can display the current processor's parameter editor list, the IO (input-output) editor list, gradient and palette editors, and the Source library list. The first 2 of these individual tabbed editors (parameter and io editor lists) allow you to edit properties associated with the currently selected processor in the processor chain editor. The gradient and palette editors let you edit the MSG preset's color gradients and color palette (which are associated with individual io streams).

The source library is context sensitive to whether the processor chain editor or the bus stream editor is the currently displayed editor. The source library will display a list of all of the individual MSG processors available to insert in the processor chain editor when it is active. Alternatively, when the bus stream editor is active then the source library will display a list of all of the potential io streams you could add to the current bus stream editor. To add a new processor or io stream to the processor chain editor or the bus stream editor, you can drag the appropriate item from the source library to the appropriate editor list.

The parameter editor displays all of the individual editable parameters associated with the currently selected processor in the processor chain editor. You can adjust the value of the editable parameter as well as lock it if you want to make sure mutations don't change it.

You can also associated a temporal generator (TG) with the individual parameter. Temporal generators are a way to associated time based oscillators with individual parameters. You can also use TG's as a way to associated interactive control modulators like the wacom pen pressure or tilt.

The IO (input-ouput) editor allows you to edit the individual input and output connections for the currently selected processor in the processor chain editor. Each processor has a certain number of input and output io connections. A processor will always have 1 or more output connections, and 0 or more input connections. These io connections can be hooked up to any of the individual io streams currently in the bus

stream editor. IO steams can be individual image buffers as well as things like color gradients or color palettes.

Each MSG preset can contain up to 3 different color gradient and palettes. They need to be in the current bus stream editor list if they are used in the preset. The gradient and palette editor tabs let you individually edit these color gradients and color palettes. Their hot key functionality mirrors that available in the Studio Artist source area for the source color gradient and source color palette.

Using MSG in the Paint Synthesizer

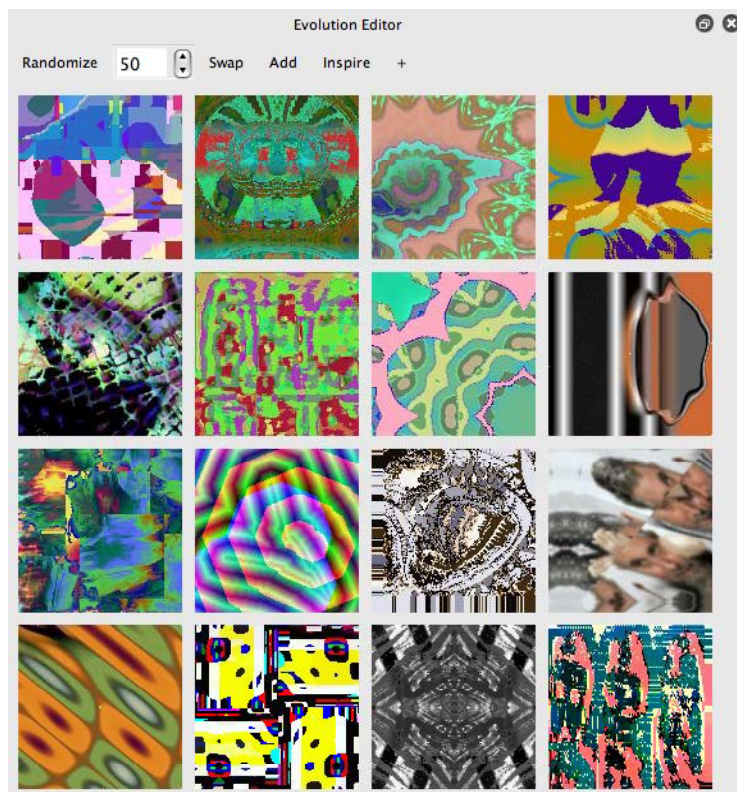
Some internal functions in the Paint Synthesizer (such as image processing brush loading) use MSG internally. However, you also have the capability to load MSG presets into a paint patch and interactively draw with them. This can be done using the MSG Brush Load option.

There is a complete description of the MSG Brush load control panel and the various editable parameters in the chapter on the Paint Synthesizer under the Brush Load section.

Version 4 adds some additional MSG options to the paint synthesizer. These include the MSG path start generator, MSG path shape, and the MSG source brush type. You can only associated 1 MSG preset with a paint preset so typically you would be using only one of the different MSG paint synthesizer options at a time.

Any MSG preset can be used for the MSG brush load or source brush options. The MSG path start or path shape options only work for MSG presets that contain a processor that can generate an output point sequence. The first processor in the processor chain editor that can do this is used for the point generation, the others are ignored. The IFS processors that generate fractal attractors are examples of processors that can generate output point sequences.

MSG Evolution Editor



The MSG Evolution Editor is a new feature in Studio Artist v4 that brings a lot of the old MSG Evolver directed evolution editing capabilities directly into Studio Artist. The evolution editor consists of a set of preview images arranged in a grid. Each of the individual images in the evolution grid is a preview image for its associated MSG preset. A toolbar located at the top of the evolution editor provides some useful interactive commands used to evolve new sets of MSG previews in the evolution grid.

Directed evolution is a way to edit or generate new MSG presets based on interactively directing random mutation or evolution of sets of MSG presets. What's nice about using directed evolution to create new presets is that it doesn't require any real technical

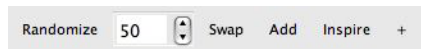
skill to create new presets. All you need to do is click on presets you like to mutate new variations. Overtime this directed evolution process can create an infinite variety of different types of abstract procedural art or different image processing effects based on the underlying MSG preset.

Clicking an individual grid cell will randomly mutate the rest of the grid with those mutations derived off of the preset you clicked. Holding down the s hotkey while clicking a grid cell will select that cell, which means that preset will become the current MSG preset in the Studio Artist interface and that the MSG Advanced Editor will update it's displays accordingly. You can also drag and drop a grid cell into the main canvas if you want to select that preset and render it into the main canvas in one action.

The r-rotate, t-translate, and h-scale hot keys used for interactive editing in the MSG Advanced Editor preview also work in the evolution grid previews, allowing you to interactively rotate, translate, or scale the grid cell preset.

Clicking a grid cell with the q or e hot keys reverse mutates the other grid cells. By reverse mutate we mean the other grid cells are mutated to move them closer to the clicked cell in the parameter space to create more uniformity in appearance (a normal click mutation moves them away from the clicked cell in the parameter space which creates more diversity of visual appearance). The q hot key uses recombination mutation while the e key uses interpolation mutation to move the grid cell presets closer to the clicked preset.

Evolution Toolbar



The evolution toolbar located at the top of the evolution editor provides a set of controls to help you perform directed evolution.

Randomize

Pressing the Randomize button randomly parameter mutates the entire MSG evolution grid (each cell in the grid mutates off of itself). If you hold down the Shift modifier key when you press it then the coloring of the presets in the grid will not be mutated. Holding down the Option modifier key when you press the button means that only the coloring of the presets in the grid will be mutated. You can click on an individual cell in the grid if you wish the entire grid to mutate from the clicked preset.

Mutation Rate

The numeric control to the right of the Randomize button lets you adjust a mutation value from 1 to 100%. Increasing this mutation rate will increase the diversity of the mutated presets. Decreasing the mutation rate means that the new set of mutated presets will be more subtle variations of the original presets. The mutation rate also affects mutations derived from a specific grid cell when you click on it.

Swap

Pressing the Swap button randomly swap mutates the entire MSG evolution grid. Swap mutation means that a random processor is selected in the preset's processor chain and then swapped for another random processor that matches it's io configuration. Holding down the Shift modifier key means that every processor in the processor chain editor will be swap mutated (this is a much more radical transformation than a single swap mutation).

Add

Pressing the Add button edits the entire MSG evolution grid by randomly adding a random processor to each grid preset. Holding down the Shift modifier key adds a random meta-edit to each grid preset. Meta-edits are pre-configured multiple processor MSG effects added to the end of the existing processor chain. Holding down the Option modifier key will randomly remove a processor from each of the grid presets.

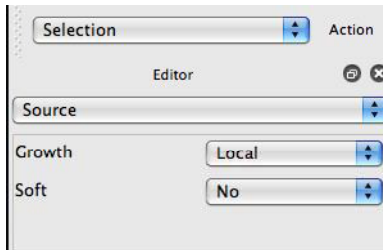
Inspire

Pressing the Inspire button fills the entire MSG evolution grid with randomly evolved random factory presets.

+

Pressing the + button loads a new sequence of MSG presets from the factory preset collection into the evolution grid. Holding down the Option modifier key will move backwards through the sequence of factory presets. Holding down the Shift modifier key will load random factory presets (as opposed to moving in sequential order through the set).

Chapter 8: Region Selection



The Region Selection Operation mode is used to interactively generate selection regions in the Canvas using a pen or mouse. The selected region can then be used as a mask for painting or for limiting the scope of an image processing operation.

The current selection can also be used to generate an alpha channel for movie or image output.

Selected regions of the Canvas can be moved within a Layer while in region selection operation mode by using the “**m**” hot key.

Some selection functionality provided in previous versions of Studio Artist is not currently available in version 4. Part of this decision was to remove confusing or essentially unused functionality. Additional selection modes and functionality may become available in future releases.

Selecting a Region Interactively

Mouse or pen down on the Canvas to dynamically select an area based on the current region selection Pen Mode and associated parameter settings. These pen modes include common selection methods such as rectangular and lasso selection as well as dynamic region growth based on visual attributes such as color or texture energy. You can change the selection pen mode by adjusting the Mode popup located at the top of the Editor when in Selection operation mode.

The current selection is displayed as a fully colored region on a partially transparent background image. When you are done selecting, you can either mouse up or you can use the **spacebar** to finish selecting if you are using a pressure or tilt sensitive pen.

After interactive selection, all unselected areas of the Canvas will be grayed out while in this Operation mode (unless the **Mask** checkbox is deactivated). To extend the existing selection, use the “**shift**” hotkey. To remove from the existing selection, use the “**option shift**” hot key combination.

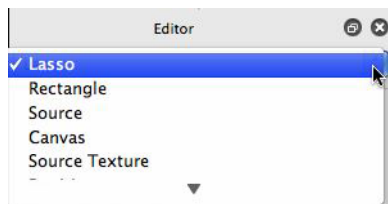
When in other Operation modes within Studio Artist, unselected areas will only be grayed out only if Region Masking is turned on. You can turn on and off Region Masking with the **Mask** popup located in the main Operation Toolbar. Or you can toggle the mask status by using the **cmd Y** hot key. If Region Masking is turned on, then operations will only take place within the masked regions.

Hint:

You can drop into region Selection while in any other Operation mode in Studio Artist by holding down the Q hotkey and mousing down in the Canvas. You will be dropped into whatever is the current Region Selection Source option. After you finish selecting, you will be back in the operation mode you were initially. The Control panel does not change when using the Q hotkey.

Region Selection Pen Modes

There are a number of different interactive pen modes, all of which perform a different type of interactive region selection. Explanations of the different selection pen modes are detailed below:



Source Based Interactive Selection

Interactively grows a region from the pen down start point, based on the chosen source attribute and the Adjuster. There are three different source-based interactive selection pen modes. They are Source, Canvas, and Source Texture. How you work with the pen or mouse is the same for all three modes.

If the adjuster is Position, then horizontal mouse movement from the start point grows the selection.

The old pressure and tilt adjustment options are not currently available in v4.

Use the t hotkey to move the selection start point while interactively selecting. Mouse or pen up or pressing the spacebar stops the selection process.

The specific details for the 4 different source pen modes are described below.

Source

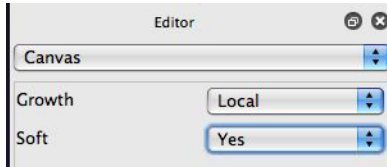
The selection grows based on the color appearance of the source image.

Canvas

The selection grows based on the color appearance of the current canvas source layer.

Source Texture

The selection grows based on the source image edge structure.



In addition, there are a number of adjustable parameters in the Editor control panel area that work with these three pen modes.

Growth

Local grows a local region from the current start point. Global grows a region everywhere in the chosen selection source that matches the current adjusted color range

Both of these 2 options are position based. They are selecting a color range based on the initial pen position and its subsequent movement. The color at the start position is what is used to compute the color range selected, but what is recorded in a PASEq is the position and adjustment, not the actual color used.

That means that if you use them in a keyframed PASEq timeline, the positions and range adjustment will be what is keyframe interpolated. Also, the selection for multiple movie frame processing with a PASEq will be based on the recorded positions and the start colors at those positions for the different movie frames or images processed by the PASEq, not the original coloring when the selection was initially recorded.

The Global Color option will actually record the actual start color used for the

selection, and subsequent movie frame selections will be based on the actual color selected as opposed to the position of the selection. So the Global Color growth option is what you should use if you want to do a true global color key selection.

Soft

A soft selection will be grown with a smooth feathered transition over the last portion of the growth range if checked. A hard edged selection with no feathering will be grown if unchecked.

Drawing Based Interactive Selection

The other region selection pen modes allow the user to draw the selection area. The specifics of the drawing depends on the particular pen mode chosen and are detailed below.

Rectangle

Interactively select a rectangular region by moving the pen.

Partition

Interactively select a rectangle that partitions the canvas. The axis you move the pen in will be partitioned and the other axis will be fully selected. This mode is very useful for cropping the canvas in one dimension while not changing the other.

Lasso Area

Interactively draw the outline of your selection with a marching ants path that will then be filled in when you raise the pen or mouse up.

Hint:

The t hotkey allows for the selection to be repositioned or translated while you are interactively selecting. Releasing the t hotkey while still actively selecting will allow you to continue the selection process. Mouse or Pen up or pressing the spacebar will stop the selection process.

Selection Region Canvas Movement

Holding down the ‘**m**’ key while in Region Selection Operation Mode allows you to move a copy of the selected Canvas region pixels directly to a new location within the current Canvas Layer instead of performing a new selection.

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.

Note that this movement happens within the current layer. A new layer is not created.

Region Selection Hot keys

‘**t**’ - Translate. At mouse down specifies translate current selection. Allows the current selection only to be moved within the Canvas.

If used while interactively selecting translates the start location of the selection process. (Currently works for **Rectangle**, Lasso area, Ellipse, and **Circle Paint** only).

‘**r**’ - Rotate. At mouse down specifies rotate current selection. If using a tilt sensitive pen you use pen orientation to define the rotation (and you can also translate by moving the pen tip). Otherwise the cursor movement around the mouse down start position defines the rotation.

‘**Shift**’ - Adds to current selection region rather than replaces

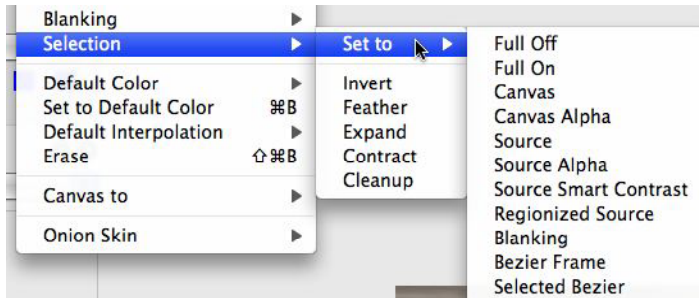
‘**Option Shift**’ - Subtracts from current selection rather than replaces.

‘**m**’ - Moves a copy of the selected Canvas region to a new location. This includes the current selection region as well as the Canvas contents of the selection region. How the moved Canvas contents are composited with the existing Canvas is determined by the m Move popup control.

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 Operation Mode of the program to momentarily drop back into Region Selection to generate a region on the fly. The current **selection mode** setting will determine the type of Region Selection performed during this momentary operation.

Region Selection Menu Commands



There are a number of different menu commands that can either set the region selection or modify it in some way. These menu commands are located in the Canvas main menu. Each of these main Canvas menus has a number of sub-menu options. Set to commands replace the current region selection with the option you choose in the submenu. The other options appropriately transform the existing region selection.

The routing capabilities of the Image Processing operation mode also allow for any of the numerous image processing effects to be applied to the current region selection. This greatly extends the capability for feathering or other selection effects by utilizing the full power of the Image Processing capabilities of Studio Artist.

Since version 4 has added the standard compositing options to many other operation modes you can route their output to the current region selection as well.

Chapter 9: Bezier Paths



Studio Artist has a unique graphics model that combines the richness and expressiveness of raster paint with the editability and scalability of Vector paths. Vector paths within Studio Artist are stored as Bezier paths. You can draw pressure and tilt sensitive Bezier paths and then edit their shape and position later.

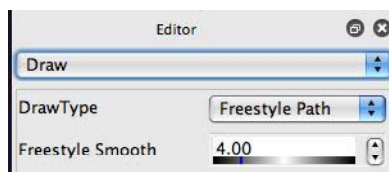
Bezier paths can either represent paint strokes or regions. Paths that represent paint strokes are open. Paths that represent regions are closed. You can use the Bezier Draw DrawType parameter to determine whether you want to manually draw a stroke or a region. Or you can generate Bezier paths automatically from your normal manual or automatic paint synthesizer drawing if the appropriate Path : Path Layer Record Option menu flags are checked.

Sets of Bezier paths can be keyframed in the Paint Action Sequence Timeline using Bezier Context keyframes. They can also be embedded into Warp or Morph Context keyframes.

Bezier paths can also be generated in real time from a source image or a canvas layer, modified and then painted automatically with a Paint Synthesizer Patch using the appropriate Path menu commands.

Working with Bezier paths in version 4 is somewhat different than in previous versions of Studio Artist. There is now just one Bezier operation mode. You choose to draw or edit with the mode popup at the top of the Editor when in Bezier operation mode. The Layer timeline is gone, everything you used to do there with bezier paths can be done with Contexts in the PAsEq timeline.

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 and tilt information will be stored along with the path. If you are using a mouse, the default pressure and tilt settings will be stored with the path.

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

The current Bezier frame can be used in several different ways. It can be a scratch pad for editing existing paint paths stored in a Paint Action Sequence. It can be used to interactively define paths for subsequent painting with the Paint synthesizer. The shape and position of Bezier paths can be animated over time.

Bezier paths can also be used to generate selection regions or masks. Bezier regions can be used to define colored regions that are filled with solid color in EPS vector output or by using the Paint Synthesizer Region Fill as Brush pen mode for generating raster region fills that take advantage of the full and awesome power of the Paint Synthesizer.

Hint

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 'Path: Path Layer Record Option'

menu flags to toggle the record state.

You can also automatically generate Bezier regions from Vectorizer operations if the appropriate record menu flags are toggled on.

Bezier Draw Types

You can choose the current Bezier Draw pen mode by using the DrawType parameter in the Editor.

You can either choose freestyle or bezier curve drawing techniques. You can choose the stroke or region option for each of these two techniques.

Freestyle

Allows for drawing a freeform curve with the pen or mouse that is then converted into a Bezier representation at mouse up. The accuracy vs smoothness of the conversion algorithm can be adjusted with the editable Smoothness parameter.

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 ‘**Cmd**’ key.

All of the different modes support several hot keys. The ‘**t**’ hot key lets you translate the existing curve path. The ‘**r**’ hot key lets you rotate the existing curve path.

If you choose the freestyle or bezier curve stroke modes, then an open Bezier path is generated. If you choose the freestyle region or bezier curve region modes, then a

closed region path is generated.

Editable Bezier Draw Parameters

There are several editable controls in the Bezier Draw control pane that influence what happens when you draw Bezier curves.

Smoothness

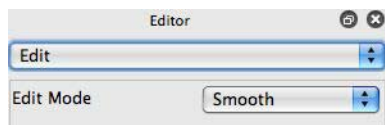
Allows you to determine the complexity of the Bezier curve that results from your freestyle drawing. Increasing the smoothness will result in a smoother curve with fewer Bezier control points. Decreasing smoothness will result in a curve that more accurately tracks what you draw at the cost of more Bezier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

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

Hints

You can always switch back and forth from where you are working to the Bezier Edit control panel by using the **cmd 5** hot key command.

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. You need to mouse down in the Canvas while in Bezier Edit operation Mode and possibly select some Bezier paths before some of these menu options to become accessible.

Hints

The master erase button with the circle icon erases the Canvas image layer and its Bezier path frame. The Set to Background button with the arrow icon just erases the Canvas image layer and does not erase its associated Bezier path frame.

You can save the current Bezier frame in a Bezier memory by option clicking on one of the five Bezier memory buttons, located in the secondary control panel located directly below the Bezier Edit Pane. Clicking on a Bezier memory will erase the existing Bezier frame and set it to the contents of the clicked Bezier memory.

The four global memories are a part of the overall workspace and are global in nature. The internal memory is specifically associated with the current paint synthesizer patch and will change if you switch to a different paint preset. The contents of the internal memory are saved with a paint patch when stored to disk as a paint preset file.

Adjustable Bezier Edit Parameters

There are several editable controls in the Bezier Edit control pane that influence what happens when you edit curves.

Edit Mode

Options for how adjacent Bezier control points interact when editing the curve. Independent allows for curve continuity to be broken at control points, providing sharp edges or kinks in the curve to be generated. Smooth insures that curve continuity is preserved as you edit the curve.

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.

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:

'[' hot key and touch curve at cut point

To join 2 curves into 1:

Select only the 2 curves you want to join. Mouse down in the canvas while holding the **'J'** hot key. The closest end points are connected, so move the 2 curves accordingly before using the menu command to connect.

To change a curve into a closed region:

Select only the 1 curve you want to make a region. Mouse down in the canvas while holding the **'J'** hot key.

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.

To redraw a single selected curve:

'e' hot key and draw the new curve shape. When finished drawing the old selected curve will vanish and your new redrawn curve will have replaced it at its old index value. This technique is extremely useful when editing Bezier paths used for morphing or warp operations.

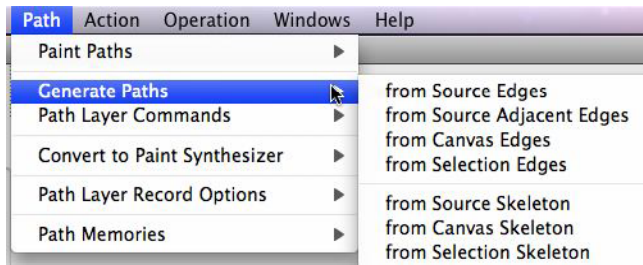
Bezier Edit Hot Keys:

- 't'** - translate selection
- 'r'** - rotate selection
- 'j'** - scale selection
- 'f'** - flip selection
- 's'** - simplify selection
- 'e'** - redraw selection (single selected curve only)
- '['** - cut curve (need to mouse down on curve at cut point)
- ']'** - heal curve (1 select curve - make region, 2 select curve - attach)

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

'shift' - normal shift select behavior

Path Frame Menu Commands



There are a number of different menu commands that work with the current Bezier path frame. These menu commands are all located in the Path main menu.

There are a number of different sections to the Path menus. The Paint Paths menus allow the current Bezier path frame or a set of selected curves to be painted with the current paint synthesizer paint patch.

The Generate Path menu commands allow you to automatically generate a complete set of Bezier paths from the source or canvas image or selection edges or their skeletons. Skeletons are vectors that define the central most interior sections of regions in images.

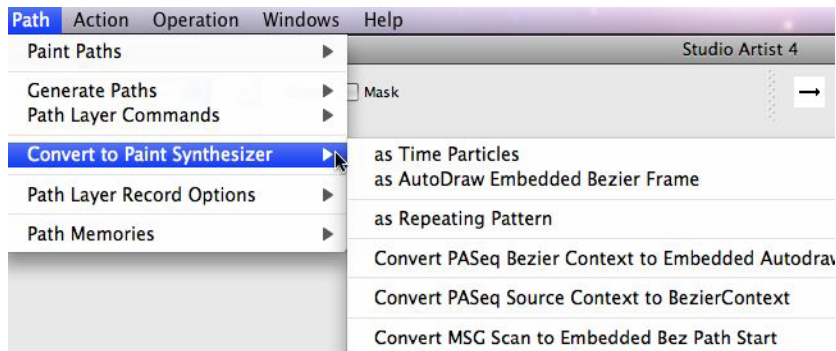
The Path Layer Commands allow for editing or transforming in some way all of the paths in the current path frame. You can erase the current path frame, stylize the paths in some way, or filter the paths to eliminate small noisy vectors after automatically generating paths from edges.

The Convert to Paint Synthesizer menus take the current path frame or a complete set of Bezier keyframes for a layer and encapsulate all of the Bezier paths and or Bezier keyframes into one paint synthesizer paint tool. These are powerful commands that allow you to specify elaborate vector animations and then encapsulate them into paint steps in a Paint Action Sequence. They are discussed in more detail in the next section of this chapter.

The Path layer Record Options allow for automatic bezier conversion and recording into the current path layer when painting manually, automatically, or vectorizing images.

The initial colors of the drawn paint strokes or regions can be stored in the paths, or they can be marked for recolorizing based on the Source area settings when redrawn. Pen pressure and tilt are stored in the recorded paths as well.

Storing Bezier Paths Within a Single Paint Synthesizer Action Step



Studio Artist has the ability to encapsulate an entire Bezier path frame within a single Paint Synthesizer Patch. Or, you can encapsulate an entire Bezier keyframe timeline within a single Paint Action Sequence action step.

All of the different command options for encapsulating sets of Bezier curves within Paint Patches or Paint Actions are in the **Path: Convert to Paint Synthesizer** submenu.

Bezier paths can be encapsulated into paint synthesizer patches in a number of different ways. They can be stored within time particles, or within the internal bezier path memory located in the Path Shape control panel..

Paint Action Sequence action steps also have the ability to store a complete set of Bezier keyframes within one PASEq action step. Rather than having to manually record all of the separate PASEq keyframes to do this, you can run the 'All Bezier keyframes to PASEq Action Step' menu command. This will record the PASEq paint action step as well as all of the associated keyframes in one easy to use command.

Encapsulating a complete set of Bezier keyframes in a single Paint Action step is extremely powerful. The automatic Bezier interpolation or tweening that the PASEq playback engine provides allows for smooth paint animation between the different keyframe snapshots. When used with the Vectorizer region output this provides a way

to morph between vector representations of images or objects and has a very different feel to it than a conventional image morph.

Each individual PASEq action step could also represent a separate animating object in an overall paint animation consisting of a large number of objects moving and transforming over time.

Generating and Filling Bezier Paths from the Vectorizer

One cool feature of the Studio Artist Vectorizer is the ability to record the vector regions it generates in the current path frame. To do this, make sure you have the Path Layer Record Option menu flag Vectorizer turned on. The Erase Before Action record flag is useful and if it is turned on then the current path frame will be erased before an action that can generate paths like the Vectorizer is run.

Once the vector regions are in the current path buffer you can edit them by hand or run any of the many Path Layer Commands or Bezier Warps to modify them in some way.

Vector regions are painted or filled in Studio Artist by using One of the Paint Paths menu commands. All of these commands use the current paint synthesizer settings. Most paint synthesizer pen modes will just draw the region path as a paint stroke. However, the Region Fill as Brush mode will fill the vector region using the full capabilities of the paint synthesizer. This could be as simple as a solid color fill, a more elaborate shaded or texture mapped gradient, spreading liquid or water color simulations, or a wild image processing filter operating in the region area.

The Paint Path menu commands will also output an EPS vector region if played back in a PASEq while generating an EPS file from the PASEq. This is a menu command located under the Action main menu. Since EPS does not support the raster fill options associated with the paint synthesizer, you should edit the paint patches you are using for vector region drawing for EPS output to draw solid flat color. A paint synthesizer macro edit under the edit menu is provided as a convenience to perform these edits quickly when working.

Generating EPS Output from Bezier Paths

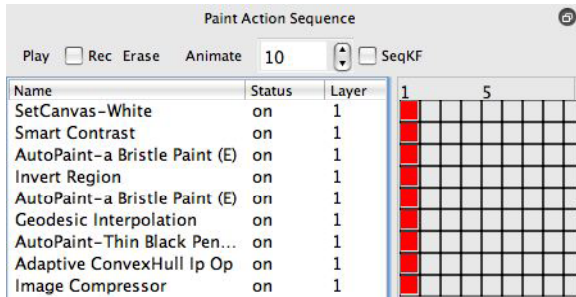
Studio Artist has the ability to generate EPS output from any manual or automatic Paint Synthesizer painting actions , and Vectorizer actions. The Vectorizer can directly output to an EPS file. The other options need to be recorded in a Paint Action Sequence, which can then be played back and rendered out to an EPS file. An advantage of using the PASEq option is that you can combine together different actions that generate eps output.

Both of these options are available as menu commands under the **Action : Generate EPS** submenu. These menu commands are located under Action as opposed to File Export because they need to run the various actions to render out the EPS information (as opposed to a file export command that just write out something already computed).

Studio Artist does not currently import EPS files. We would need a complete postscript interpreter to be able to do this.

You can save your Bezier paths by exporting a Bezier path frame using the Studio Artist File Format option in the export file dialog. You can then import the saved Bezier path frame at a later time. Studio Artist Session files also store all of the layer bezier path frames as well as bezier keyframe information (and everything else associated with your Studio Artist work session).

Chapter 10: Actions



Studio Artist has the ability to record, edit, and playback any series of manual or automatic Operation Actions. These individual steps could include automatic painting, manual painting, image operations, interactive warping, interactive adjustments, region selection, color fills, etc. In addition, any transformational menu commands such as **“Paint Path Layer”** can also be recorded as individual steps in an Action Sequence.

Two different editable lists and associated controls are provided to work with Action Sequences. They are called Paint Action Sequences and History Sequences. Internal to Studio Artist they are essentially the same. They use the same data and file formats and are recorded, played back, and edited with the same individual sets of controls. The reason there are two different sequences is that they are used in different ways in normal work flow within Studio Artist.

The current History Sequence is intended to record everything done in Studio Artist for the purpose of providing a form of unlimited undo. In addition, a History Sequence can be rerendered and played back into a Canvas with a different resolution.

The current Paint Action Sequence is intended to be used to automate tasks that require several steps, and as a script for generating animations or for movie processing. Paint Action Sequences can also be organized as Paint Action Sequence Presets for easy access and execution. Paint Action Sequences also incorporate a keyframe timeline.

Working With Paint Action Sequences

To view or edit the current Paint Action Sequence, use the menu command ‘**Window: Paint Action Sequence**’. This menu command will bring up a palette containing the current Paint Action Sequence. Depending on your workspace configuration the PASEq palette may be floating or docked in the main canvas.

Sequence Controls



There are several controls located at the top of the Paint Action Sequence palette. The Play button plays back the different Action steps recorded in the Paint Action Sequence. Each individual step in the Action Sequence will be highlighted as that step is currently being played back. The list will auto scroll as playback progresses to always keep the currently playing Action in view.

You can stop the Sequence playback by using the spacebar at any time during playback. Option clicking the Play button will continue sequence playback from the current selected Action step.

The Erase button will erase the entire current Paint Action Sequence. To erase individual Action steps, use one of the Paint Action menu commands discussed below.

The Record checkbox turns on and off recording for the Paint Action Sequence. When recording is on, every time a recordable Action is initiated in Studio Artist, it is recorded as a new step in the Paint Action Sequence.

Individual Action Step Controls

To select a particular Action step in the sequence, mouse down on the list element. To drag a selected Action step to a new location in the sequence list,, mouse down on the individual Action step and then drag it to a new location in the list. As you drag the outline of the individual step, a selection bar will show the potential new location for the dragged step. When you release the mouse, the dragged individual step will be moved to the new list location.

You can control click a particular action step to playback that particular Action sequence step. Or, you could click on the first keyframe for the action step in the PASEq timeline if you have it displayed. All of the interface settings associated with the particular Action step will be reset to the parameter values stored within the step prior to playing the step. There is also contextual menus to just playback the interface settings without playing back the action

If Studio Artist's current operation mode is Bezier Edit, then running the individual action step will load the current Bezier path frame with the stored path for that particular Action step. This is only true if that Action step is associated with a single editable path, such as the individual mouse actions associated with drawing single paint strokes.

Option-clicking an action step's first keyframe will update the Action sequence step's stored parameters to the current Studio Artist interface parameter settings. This is the mechanism used to edit a step in an Action Sequence. You can also use the 'interface to action step' contextual menu to do this

If Studio Artist's current operation mode is Bezier Edit, then option-clicking the action step's keyframe will also record the first Bezier path in the path frame as its recorded path in addition to recording any appropriate interface parameter settings.

Each Action sequence list element has a status menu that can be used to mute or disable its Action step without removing it from the list. If the status is on, then the Action step will play back. If the status is off, then the Action step will be skipped during playback.

Paint Action Menu Commands

Various menu commands are also available in the ‘**Action: Paint Action Sequence**’ submenus that operate on the current Paint Action Sequence or the currently selected Action sequence list element. Some of these menu commands provide an alternative to the interactive controls at the top of the Paint Action Sequence palette.

If recording is enabled and a new Action step has just been recorded, then executing a “**Edit: Undo**” menu command will remove the last recorded Actions step as well as undo the results of that Action in the current Canvas.

Unique Features of Paint Action Sequences

Pre-built Paint Action Sequences can be accessed by calling up Paint Action Sequence Presets. Whenever a new Paint Action Sequence Preset is imported or chosen in the Preset control panel, it will overwrite the current existing sequence in the Paint Action Window.

To save an existing Paint Action Sequence as a Paint Action Sequence Preset, use the “**File: Export: Paint Action Sequence...**” menu command. Save the exported file in the PASEq folder next to the Studio Artist application, and it will appear the next time you startup Studio Artist as one of the accessible Paint Action Sequence Presets.

Each first level subfolder within the PASEq folder will show up as a specific Collection within the Paint Action Sequence Preset control panel. Each first level subfolder within each of the Collection folders will be a Category for that particular Collection. The Category name will be the subfolder name. Any Paint Action Sequence files within one of these Category subfolders will be the individual Presets associated with its Category.

Keyframe Animation in Paint Action Sequences

Paint Action Sequences also include keyframe timeline animation features. The Paint Action Sequence window can be extended to the right by dragging the bottom right hand corner of the window with the mouse. Extending the horizontal size of the window reveals a keyframe timeline.

The keyframe timeline is composed of a grid of keyframe cells. The horizontal axis represents frames. The vertical axis represents the individual steps in the Paint Action Sequence associated with a particular frame.

Each recorded keyframe within the timeline represents a complete snapshot of all of the editable parameters associated with its particular Action Step. When playing back an animation, the keyframe timeline will automatically interpolate the settings of any blank keyframes located between 2 recorded keyframes to smoothly animate the associated Action Step parameters over time.

This keyframe tween interpolation could include individual parameter values associated with a paint path or image processing effect as well as the vector paths and color information associated with a paint stroke or filled region.

Special Mute keyframes can also be recorded which turn off a particular action step in an animation until another active recorded keyframe for that step is reached.

Animation Sequence Controls



There are several animation controls located at the top of the Paint Action Window. The Animate button plays back the different Action steps recorded in the Paint Action Sequence for each frame in the animation sequence. Each individual step in the Action Sequence will be highlighted as that step is currently being played back. The list will auto scroll as playback progresses to always keep the current frame and currently playing Action step in view.

You can stop the Sequence playback by using the spacebar at any time during playback. This will bring up a dialog box asking you if you wish to continue the animation processing or stop it. Press the appropriate button. Be aware that unlike previous version of Studio Artist, mousing down in the interface will not stop a PASEq animation of movie processing sequence from processing. The Animate Continue button will continue animation sequence playback from the current frame and current selected Action step if you do stop a sequence.

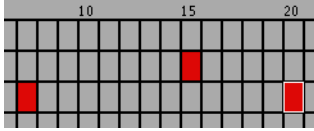
You can also run the complete timeline animation by using the Action: Generate Frames: Run PASEq Animation menu command.

If you have an Open Movie Stream or Image Stream, then the individual frames associated with the animation will be written out to the Open Movie Stream.

Sequential Keyframing is a powerful new feature in version 3. It allows you to automatically record a series of keyframes while you draw without having to manually option click on each keyframe cell to record it. This can greatly automate the process of manual rotoscoping or generating hand drawn paint animation. Support for sequential keyframing was significantly enhanced in version 3.5.

Sequential keyframing is described in more detail in the next section on working with the timeline.

Working with the PAsEq Keyframe Cells



Each vertical column of keyframe cells represents a specific frame in the animation. Each cell in the vertical column represents its associated Action step at that frame time. Each horizontal row of keyframe cells represents all of the frames associated with a particular Action step.

If a particular cell is colored Red or Black, then there is a recorded keyframe associated with its corresponding Action step and frame time. Red normal keyframes record every editable parameter in the Studio Artist interface associated with the particular action being recorded.

Black Mute keyframes mute the associated keyframe track until the next normal Red keyframe. These are useful when you only want a particular action step to playback for a certain range of frame values in an animation.

If the cell is not colored red or black, then a keyframe is not recorded there. If a cell is not recorded and is between two recorded horizontal cells, its value will be interpolated based on the keyframe values of the two recorded keyframe cells it is in-between.

To record a normal keyframe in a given cell, hold down the option button and mouse down in the cell. The cell will fill in Red when the keyframe is recorded in the cell.

To record a Mute keyframe in a given cell, hold down the option button and the m key and mouse down in the cell. The cell will fill in Black when the Mute keyframe is recorded in the cell.

To Erase a keyframe, hold down the cmdn-option keys and mouse down in the cell. The cell will no longer be filled with Red when it is erased.

In normal operations, mousing down in a particular cell will set the appropriate controls in Studio Artist to the values associated with that particular cell. This includes empty keyframe cells, which will be set by interpolation based on the adjacent horizontal keyframe values.

If sequential keyframe mode is turned on, then mousing down in a particular keyframe will only play back the particular interface parameter settings associated with that action step at that keyframe time and will not play back the actual action itself. Sequential keyframe mode is a powerful new feature in Studio Artist 3 that provides a powerful tool for quickly generating paint stroke animations or doing manual rotoscoping from a loaded source movie.

If PASEq sequential keyframe and record mode checkboxes are turned on, then you can use sequential keyframing to automatically record a series of individual keyframes automatically as you draw. Start by clicking on the top keyframe for a series of manually drawn paint strokes recorded in a PASEq. For example, the paint strokes might be a person's facial features.

Then, redraw all of the initial curves in their new shapes and positions for that frame time. Notice how after you draw each paint stroke, the keyframe for that action step is automatically recorded and the selection cell moves vertically to the next action step. When you are done with a complete set of paint strokes for a frame time, you simply click on the new frame time for the first action step and repeat the whole process over again.

Sequential keyframing removes the tedium of manually option click recording a series of animation keyframes and allows you to concentrate on creative drawing rather than switching your attention back and forth from drawing in the canvas to managing and recording keyframes in a separate window.

Bezier Edit and PASEq Keyframe Cells



If Bezier Edit Operation Mode is active, you can record and edit the underlying Bezier paths associated with a particular paint stroke independent of its particular Paint Synthesizer parameter settings.

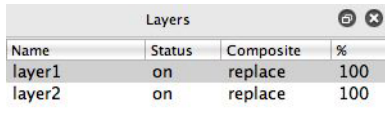
Mousing down in a PASEq keyframe cell associated with a manually drawn paint stroke Action Step will display the underlying Bezier path associated with that paint stroke at that particular frame.

The paint stroke Bezier path can then be edited using the normal Bezier Edit Operation mode techniques. After editing the Bezier path, option-clicking the associated PASEq keyframe will record the edited Bezier path into that particular keyframe.

This technique can be used to animate the movement of individual paint strokes over time.

If you playback the animation while in Bezier Edit Operation mode, the Bezier path layer only will interpolate. You will end up with a series of interpolated Bezier paths but no actual paint in the Canvas. You should switch back to Presets or the Paint Synthesizer operation modes before running the animation for normal animation playback.

Chapter 11: Layers



Name	Status	Composite	%
layer1	on	replace	100
layer2	on	replace	100

The Studio Artist Canvas can be composed of multiple layers. Layers can be viewed in isolation from other layers or in combination. These 2 ways of viewing are called 'view current' and 'view all'. Layers can be combined together in view all mode using different compositing algorithms, alpha masks, and independent transparency percentage to build up a more complex overall image.

Each layer is composed of 32 bit RGBA (red, green, blue, and alpha) pixels. The RGB image planes contain the colored image. The A or alpha image plane contains additional transparency information for each pixel. This alpha transparency information is only used in the layer view display process if alpha is 'enabled for view'. Otherwise the alpha channel is ignored when constructing the view. This flexibility allows other uses for the alpha channel within Studio Artist.

layer2 on replace 100

Each layer has an associated name, status, compositing algorithm, and alpha independent transparency control used when the canvas is viewed in all layer mode. When alpha channels are enabled, there is also a fixed background color that can be specified in the Canvas: Alpha: Background submenus.

Each layer also has an integral Bezier path frame. The path frame stores a collection of Bezier paths that can be used to edit or animate individual paint strokes or to specify and animate anchor paths for things like timeline warping or morphing. The Bezier path frame is not displayed in the canvas view unless you are in Bezier operation mode.

When multiple layers are viewed together, they are overlaid on the working canvas in order from the top to the bottom of the layer list.

Photoshop users may note that top to bottom layer overlay order is the reverse of what they are used to. The thing to remember is that all lists in Studio Artist consistently run from top to bottom, and that includes layers as well as paint action sequences, MSG processor chains, etc.

Individual layers in the overall list can be muted, which means they will not appear in View All display mode. You can still view muted layers when in Current Layer view mode.

One use for muted layers while working is to use them as scratch pads for trying out ideas without modifying your final working layers. They can also be used to mix paint or to store intermediate image results in PASEqs that work with multiple layers. If you are working with Bus modulation in the paint synthesizer you can also use muted layers to store images or textures that can be used to modulate paint effects.

Working With Layers

To view or edit the current Canvas Layers, use the menu command ‘**Windows: Layers**’. This menu command will bring up a palette that contains the current Canvas Layers.

Layer Controls in the Operation Toolbar



There are several controls located in the Operation ToolBar. The + and - buttons can be used to zoom out or in the view magnification. The Current Layer popup shows the name of the current layer and lets you switch to any of the other layers in the layer list (located in the Layers Palette).

The View Icon Popup determines how the current layer is displayed within the overall Canvas. View Current implies that only the current layer is displayed in the Canvas. The layer compositing and overall transparency controls will be ignored when Current Layer Only view mode is active.

View All displays all non-muted layers simultaneously in the Canvas. The overall view is generated by placing layers in order from the top of the list to the bottom within the overall Canvas. The layer composite and transparency controls determine how a positioned layer interacts with already positioned layers in the canvas. If the Alpha: Enable for View menu flag is enabled, then the integral alpha channel for the layer will also influence its pixel transparency.

Layer Palette

The Layers Palette consists of a list of individual layers. Each layer consists of a name, status, composite, and % transparency settings as shown below.

layer2 on replace 100

To select a particular layer in the list, mouse down on the layer list element. The selected layer will be highlighted, and will become the current layer. You can also switch layers using the Layer popup in the Operation Toolbar.

You can drag a selected layer to a new location in the list. To do this, mouse down on the individual layer and then drag it to a new location in the list. As you drag the outline of the individual step, a selection bar will show the potential new location for the dragged step. When you mouse up, the dragged individual layer will be moved to the new list location.

Option dragging a layer will make a new layer that is a copy of the original dragged layer as opposed to a normal drag that just moves the layer to a new position in the list. As with normal layer dragging, when you drag the outline of the individual step, a selection bar will show the potential new location for the dragged step. When you mouse up, a copy of the dragged individual layer will be positioned in the new list location.

Only one layer at a time can be the current canvas layer. You can choose a specific layer to be the current layer by selecting the layer list element mentioned above or by using the layer popup located directly above the canvas. The current canvas layer list element is highlighted. The name of the current layer is also displayed in the current layer popup in the operation toolbar.

The Status of the individual layer list element determines whether the associated layer is active (the status is on) or muted (the status is off). All active layers are displayed when the View is set to All Layers. Any muted (status is off) layers are not displayed

when the View is set to All Layers. The status has no effect when the View is set to Current.

Muting individual layers allows them to be used as scratch pads or temporary result processing buffers without having them affect the overall composited view. For example, you could use a muted layer to mix colors using a wet paint hidden from your overall drawing canvas. Or, you might use a muted layer as a temporary buffer to process the selection region in some way without affecting the overall viewed drawing canvas while processing a movie file in a paint action sequence.

The compositing popup to the right of the layer name allows for different compositing options to be chosen for the particular layer when displayed in View All mode. Compositing defines a specific algorithm for algorithmically combining the layer with what has already been displayed on the canvas.

An edit field to the right of the layer compositing popup allows a partial transparency to be specified for a layer. A setting of 100 % means no transparency, a setting of 0 % means the layer will be fully transparent and not seen. This partial transparency is global for the entire layer and independent from any pixel based alpha channel transparency associated with the layer.

Layer Menu Commands

There are a large number of layer and layer timeline menu commands located under the main Canvas menu.

The Layer menu commands can be used to add or delete layers, resize layers, flatten layers, set the layer to a specific background, change the layers view, capture the current view to a layer, etc.

Movie layers are layers that reference a movie file in addition to a static image frame buffer. When a movie layer is the current layer a movie transport appears at the bottom of the Layer Palette. You can use this movie transport to play or frame adjust the movie associated with the movie layer. Movie layer menu commands can be used to add new movie layers, open existing movies as movie layers, record frames, insert or delete frames, etc.

You can also access Supersizer interpolation functionality when resizing the canvas. Supersizer is a Synthetik image interpolation algorithm that provides superior image quality to the normal bicubic image interpolation. Its described in more detail in the next section.

More detailed information on the various Layers and Movie Layer menu commands is included in the Chapter on Menu Commands in the section associated with the main Canvas menu.

Supersizer Interpolation

Supersizer is a Synthetik interpolation technology that we developed for the Supersizer application. We've taken the Supersizer technology and more directly integrated it into version 4.

You can use Supersizer to blow up a small source image into a much larger canvas image. For example, you could take a small 100 pixel image and generate a much larger 600 dpi image suitable for printing. Supersizer generates an interpolated image with greatly reduced visual artifacts when compared to algorithms such as bicubic interpolation, which is the standard method for blowing up images. The tradeoff is that for large expansion ratios it may take longer to run than the bicubic interpolation technique.

To use Supersizer, you need to set the default interpolation option to Supersizer using the appropriate Canvas : Default Interpolation menu flag. With Supersizer as the default interpolation option, it will be used whenever an image needs to be resized in Studio Artist. This could include things like setting the current layer to the source image, resizing the canvas, or using the Ip Source option in Image Operations, Vectorizer, or MSG effects.

Chapter 12: Movies



You can use Studio Artist to generate movies from scratch or to process existing movies. You can also use Studio 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.

There are primarily three different ways to work with Movie files within Studio Artist. You can generate a new movie file from scratch, transform an existing source movie file into a new processed output movie file, or load an existing movie file into the Canvas via a Movie Layer and hand paint or process individual frames.

In addition, Studio Artist has the ability to use a movie file as a source for a paint synthesizer brush or background texture. This can be used to provide a mechanism for compositing multiple source movie files into a final composited output movie file. It also allows for creating very sophisticated interactive paint tools that index into the individual movie frames when drawing.

Movie brushes can also be used to create amazing photo-mosaic paint effects where the source image is represented by smaller images stored in the individual movie brush frames.

Automatically Processing an Existing Movie File

Studio Artist allows you to automatically process an existing source movie file into a new auto-rotoscoped or effected movie file. Studio Artist works with video frames stored in either Quicktime movie files or as individual numbered frame images in a folder.

If you are working on a nonlinear editing system like Final Cut Pro, an Avid or Media 100, you should export your video as a Quicktime movie file. After processing the Quicktime movie file within Studio Artist, you can re-import the processed Quicktime video file back into the native format of your particular nonlinear editing system.

You also have the ability to process and or generate a folder of numbered individual frame image files in any of the image file formats that Quicktime supports. This includes Photoshop, Tiff, Targa, Pict, Sgi, Bmp, Jpeg, and Png file formats.

The size or resolution of the processed output movie file can be different than the source movie file. This means that a postage stamp size source movie file can be used to generate a full high resolution processed output movie (if you wish).

Both the source movie file and the processed output movie file reside on your harddisk. You do not have to load a movie layer to process an existing movie file with a Paint Action Sequence.

Studio Artist supports up to a 4000x4000 pixel output movie frame size when processing a movie file. If you work with numbered frame images you can go to even higher resolutions. This means that you can work with or generate high resolution processed movies for use in feature films or broadcast video.

You also have the ability to output vector style movie paint strokes and flat color vector regions as a series of numbered EPS frame files. EPS output for individual frames allows for resolution independent final frame size and could be used for rendering high

quality vector graphics to film or IMAX frame resolutions.

For DV or digital video files, you would typically work with a 720 x 480 pixel Canvas, or 1280 x 720 pixels for HD files. For analog NTSC video you can work with a 640 x 480 pixel Canvas size.

A De-Interlace Image Operation is provided to de-interlace the even or odd frames fields if you are working with digitized analog video in your Quicktime source movie file. It is suggested that you de-interlace analog video frames for best results when processing analog video files. There are also compositing options available in image operations that can be used to re-interlace a final output field by compositing to the even or odd field.

Batch Processing a Movie File with a Paint Action Sequence

To process an existing source movie file with a Paint Action Sequence, you first need to choose a Paint Action Sequence Preset or record a new Paint Action Sequence.

To choose a Paint Action Sequence Preset, use the menu command “**Operation: Presets: Paint Action Sequence**” to bring up the appropriate Preset control panel. Select a Preset category using the Collection and Category popups. Then choose a specific Preset by mousing down on one of the Preset icons in the preset list.

You are not restricted to using the existing preset Paint Action Sequence Presets when processing movie files. You can also build a new Paint Action Sequence from scratch or edit an existing preset prior to processing a movie file. Whatever Action steps are currently recorded in the sequence are what will be used when the movie file is processed.

You can then process an existing movie file located on your hard disk with the current Paint Action Sequence. To start the process, use the “**Process with Paint Action Sequence**” menu located in the “**Action**” main menu.

Various sub menu commands are associated with this menu option. You can choose to process an existing movie file to a processed movie output file by choosing the Movie to Movie menu option. Your input options can be a movie or a folder of frame images. Your output options can be a movie file, folder of frame images, or folder or EPS frames.

You will first be prompted to select a source movie file with a standard file dialog. Choose the original source movie file you wish to process. Your original movie file will not be modified in any way.

You will then get a dialog that allows you to specify the Canvas or output movie frame dimensions. The output frame dimensions can be different than the input frame dimensions. Set the dialog controls appropriately to specify the output movie resolution you want to generate.

After hitting **OK** for in the Set Canvas Size dialog box, you will be given a standard file dialog to name your processed output movie file.

If you hit Cancel at this point, 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 movie file. Press the spacebar to stop the movie processing at anytime.

Each input frame from your original source movie file will be used as a source image for the current Paint Action Sequence. After the complete Paint Action Sequence runs on a particular source frame, the processed Canvas image will be written out to your generating output movie file. Then the next input frame will be loaded and the Paint Action Sequence will run again on this new frame. This will continue until all of the frames in the source movie file have been processed by the paint Action Sequence.

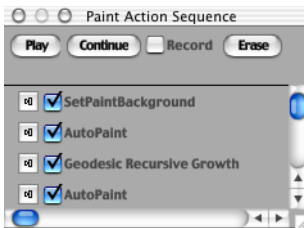
You can examine or edit the current Paint Action Sequence by using the '**Windows:**

Paint Action Sequence” menu command. This will be discussed in more detail in the next section.

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 or paint on top of the original movie source frame. You can do this by setting the Canvas Background popup to Source Image while recording your Paint Action Sequence.

If performing an Image Operation, you could also set the Ip Source to Source Image rather than the Current Layer. Doing so means that the source image will be used as input for the image operation effect as opposed to the current canvas layer.

Using Paint Action Sequences for Movie Processing



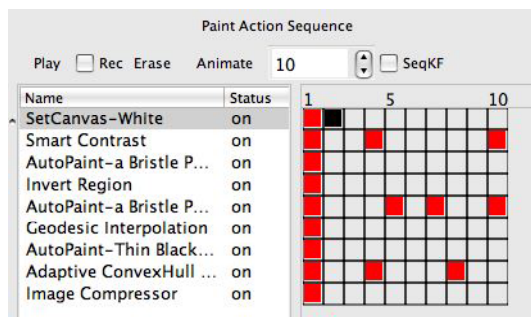
Each frame of the source movie file will be processed by the various Action Steps in the current Studio Artist Paint Action Sequence. To view or edit the current Paint Action Sequence, use the menu command '**Windows: Paint Action Sequence**'. This menu command will bring up a palette that contains the current Paint Action Sequence.

There are several controls at the top of the Paint Action Sequence Palette. The Play button plays back the different Action steps recorded in the Paint Action Sequence. You can stop the Sequence playback by using the spacebar or by mousing down in the Studio Artist interface. The Erase button will erase the entire current Paint Action Sequence.

The Record checkbox turns on and off recording for the Paint Action Sequence. When recording is on, every time an Action is initiated in Studio Artist, it is recorded as a new step in the Paint Action Sequence.

To select a particular Action step in the sequence, mouse down on the Action Sequence list element. You can drag a selected action step to a new location in the sequence list by mousing down on the action step and dragging it to a new location.. You can use control click contextual menus to play back or re-record individual selected paint action steps..

Various menu commands are also available in the '**Action: Paint Action Sequence**' submenus that operate on the current Paint Action Sequence or the currently selected Action sequence list element.



The Paint Action Sequence palette also includes an integrated keyframe timeline associated with the individual Action Steps in a Paint Action Sequence.

There's a vertical spacer in the center of the palette below the top toolbar you can use to adjust the positioning of the display view of the paseq action step list on the left and the associated keyframe timeline on the right side of the palette. If the timeline is hidden from view move the vertical spacer to the left to bring the timeline into view.

Press the Animate button to playback a PASEq animation. You can stop the Sequence playback at any time by using the spacebar. There is a Continue menu in the Action : Paint Action Sequences submenu command that will continue animation sequence playback from the current frame and current selected Action step.

You can run one of the Action : Animate with Paint Action Sequence menu commands if you want to spool your animation to a movie file, or a folder of image or eps files.

Sequential keyframing mode is a powerful new tool that allows a user to quickly build up tween paint animation from a series of free drawn images. When combined with integrated source movie onionskin transparency, it greatly enhances the workflow for manual rotoscoping or generating hand drawn animation.

Pre-built Paint Action Sequences can be accessed by calling up Paint Action Sequence

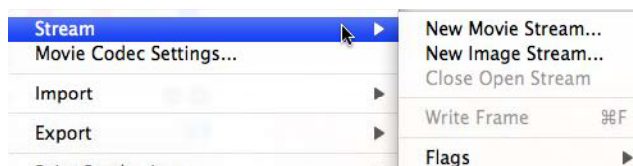
Presets. Whenever a new Paint Action Sequence Preset is imported or chosen in the Preset control panel, it will overwrite the current sequence in the Paint Action Window.

For more information on working with Paint Action Sequences, read the User Guide chapter on Actions.

Generating a New Movie File With a New Movie Stream

Studio Artist provides several alternative methods for generating new movies or processing existing ones. An alternative to the batch style movie processing command options located under the main Action menu is to work with **Movie Streams**. A **Movie Stream** can be thought of as an open quicktime file. Frames can either be written out manually into an open **Movie Stream**, or by playing a **PASeq** animation frames will automatically be written into the open movie stream as they are generated.

Movie Streams can be configured to automatically write frames as you work. These preference settings include the ability to automatically write frames after each action, after each **paseq** or history step, or at timed intervals while you are drawing.



To generate a new movie file from scratch, use the menu command “**File: Stream: New Movie Stream...**” to initiate a new movie output stream file. This menu command will bring up a standard file dialog that allows you to specify the name of the new movie stream and its location on your harddisk.

The dimensions of the output movie will be the dimensions of the current Canvas. The frame rate will be the setting of the “**Frames per Second**” parameter, located in the **File : Movie Codec Settings** menu dialog.

Once you start a new movie stream, you can write out movie frames in a number of different ways. You can either write new frames to the open movie stream by hand or run different animation operations that will generate a series of frames and write them sequentially to the open movie file. You can continue to write frames to the open movie stream until it is closed with the menu command “**File: Close Stream**”.

To manually write a frame to an open movie stream, use the menu command “**File: Stream: Write Frame**” or the hot key Cmnd F. This menu command will take the current contents of the Canvas and write it out as one frame in the open movie stream.

You can automatically write out a new frame to an open movie stream at the conclusion of each Studio Artist Action by checking the menu command flag “**File: Stream: Flags: Enable Write on Op End**”.

You can automatically write out a new frame to an open movie stream after a PASEq or History Sequence concludes by checking the menu command flag “**File: Stream: Flags: Enable Write on PASEq Cycle**” and then playing back the PASEq or History Sequence.

You can also specify a specific time interval for frames to be automatically written out as you draw. For example, you could output a new frame 4 times a second as you draw or work in the Canvas. To do this, you open the “**Preferences**” dialog and specify the appropriate Movie Stream AutoWrite FPS setting in the preference dialog's Movie tab.

When you are finished writing our new frames to the open Movie Stream, you need to close the active movie file by using the “**File: Stream: Close Open Stream**” menu command. An open Movie Stream needs to be closed before it can be opened and played in another application like MoviePlayer.

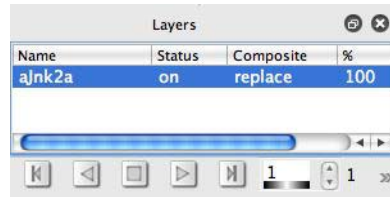
Generating a New Canvas Movie Layer

Layers in Studio Artist 4 have the ability to be image layers or movie layers. You can have multiple layers that are loaded movie layers. However, you can currently only play back the current movie layer (as opposed to playing back a view all composited stack of multiple movie layers).

To convert an existing canvas layer to a movie layer, use the menu command “**Canvas: Movie Layer: Convert to Movie Layer**”. This menu command will bring up a standard file dialog that allows you to specify the name of the new Canvas Movie file and its location on your harddisk. Your existing current layer will now be a movie layer.

To load an existing movie as a new layer that is a movie layer you can use the **Canvas: Movie Layer: Open Movie as New Layer**. To open a new movie layer you can use the **Canvas: Movie Layer: New Movie Layer** menu.

After the new Canvas Movie loads, there will be a set of Canvas Movie transport buttons located at the bottom of the layer palette



If you make a new movie layer than whatever was in the current Canvas will be the first default frame in the movie file. Initially the new Canvas Movie will only contain one frame. You can overwrite the contents of this frame or add new frames.

To overwrite an existing movie frame, mouse down in the R button in the Canvas movie transport. Whatever image is in the current Canvas will overwrite the current Canvas movie frame. To insert a new frame after the current movie frame, hold

down the ‘shift’ key and mouse down in the R button in the Canvas movie transport. Whatever image is in the current Canvas will be inserted as a new movie frame located after the current frame. You can also use the appropriate Canvas : Movie Layer menu commands to record, insert, or delete movie frames.

All edits to a canvas movie layer are live and created via playlist edits. You can save a flattened version of the loaded movie layer by using the ‘ Canvas: Movie Layer: Save Flattened Canvas Movie to” menu command.

You can use the ‘Canvas: Movie Layer: Convert to Image Layer” menu command to unload a movie layer and convert the layer into a normal image layer containing the last displayed frame image in the layer.

Working with Movie Layers in the Canvas

Studio Artist allows a Quicktime movie file to be loaded directly into the Canvas via a Movie Layer. Individual frames can then be accessed for painting, touch up, image processing, keying, etc. Once a movie file has been loaded into the movie layer, it can be played or single stepped forwards and backwards.

Manipulating a Movie Layer Frame

If you have loaded a movie file into a movie layer, you can paint on top of it or process it manually frame by frame. You need to use the **R** movie transport button to record any changes you make to a frame before you move to a new frame or they will not be recorded. Your edits are saved as you create them to the associated movie file. The changes are nondestructive. The changed frames are added to the existing movie file and the movie track playlist is edited accordingly.

If you want to insert the Canvas image as a new frame rather than overwrite an existing one, you should hold down the shift key before pressing the R movie transport button to insert the frame.

There are a number of menu commands associated with the loaded Canvas Movie, which are accessible under the Canvas : Movie Layer : menu. You can insert N frames at a given location or insert N blank frames in an existing animation.

You can also delete a frame in the movie using the appropriate menu.

How Frames are Stored

Edited frames are saved in uncompressed format using the animation codec. This is necessary to avoid potential incompatibilities between different codecs interacting in the same Quicktime file. You can use the “Canvas: Movie Layer: Save Flattened Canvas Movie As...” menu command to save the current Canvas Movie using the

default Preference: Movie Compression settings. This will recompress all the frames using the chosen codec and also flatten the resulting new output movie to only include the actual frames used in the movie, eliminating old unused frames associated with the nondestructive original movie edits that are still in the media track.

Generating a Moving Bezier Mask

Studio Artist has the ability to generate a series of selection masks directly from the current path frame. By using the KeyFrame Timeline, these Bezier masks can be animated over time. This could include scaling, rotation, and movement as well as deformation or reshaping.

To convert the current path frame into a set of individual mask regions, use the **“Canvas: Selection :Set to: Bezier Frame”** menu command. Studio Artist assumes that each Bezier path in the path frame is the outline for a single Bezier region.

If the above command is recorded in a Paint Action Sequence, then the contents of the KeyFrame Timeline can be used to specify a series of animating selection masks. To soften the edges of the resulting Bezier selection masks, use the **“Canvas: Selection :Feather”** menu command.

Working with Alpha Channels in Movies

Studio Artist has the ability to work with embedded alpha channels within QuickTime movies. Selection masks based on the alpha channel associated with each source movie frame can be generated when processing movies. Alpha channels can also be generated for each output frame from a variety of sources. QuickTime's alpha graphics modes for movie playback are also supported for loaded Canvas movies.

Working with the Source Movie Embedded Alpha

To generate a current selection region from a movie frame alpha channel, use the **“Canvas: Selection: Set to: Source Alpha Image”** menu command. Recording this command as an Action step in a Paint Action Sequence will automatically generate a selection region from each individual movie frame when processing a movie file with that Paint Action Sequence.

To use the current selection region as a mask for any Operation, turn the Mask checkbox in the Operation Toolbar. Any Actions recorded in a Paint Action Sequence while masking is on will use the current selection region as a mask. You need to set the Paint Action Sequence Mask Playback parameter to on if you want the mask settings to playback when you playback the PASEq

In addition, embedded alpha channels in movie files can be used as masks for movie compositing. See the section on “Using Movie Brushes to Generate Compositing Effects” for more information.

Generating Embedded Alpha in a Processed Output Movie

An output frames alpha mask can be generated from a number of different sources, including:

1. Full On
2. Full Off
3. Current Layer alpha channel
4. Current source frame alpha channel
5. Current region selection
6. Keyframe Bezier mask via conversion to a region selection
7. Current Blanking frame.

Paint stroke alpha painting is a global menu preference setting in Studio Artist 4, and is accessed via the Canvas :Alpha :Paint Synth Alpha Enable menu flag. Turning this menu flag on insures that any painting will paint in the layer alpha channel in addition to the RGB color channels. The layer alpha channel can then be used as the source of the embedded alpha channel for the movie output.

For movie files generated from scratch or by processing existing files, alpha channel generation options can be accessed in the preferences dialog under the Movie tab.

Working with Final Cut Pro and iMovie

Studio Artist can work with a large number of different movie editing programs, including Apple's Final Cut Pro and iMovie. Here are a few hints to make working with these great programs a little easier.

To process source video from either program, you should export the source footage as a Quicktime file. You can then process the source footage with a Paint Action Sequence to generate an effected processed output Quicktime movie file. This effected Quicktime movie file can then be imported back into the program you are working with.

Apple's iMovie program is designed to work primarily with DV or Digital Video format movie files. You should set the File : Preferences : Movie Compression preferences to one of the DV compression settings (like DV NTSC). If you are generating output as a movie stream, also make sure your Canvas size is 720x480 pixels, which is the size of a DV video frame.

Final Cut Pro can import additional movie compression formats. For high quality uncompressed video output with an embedded alpha channel you should choose the animation codec with Millions of Colors+. Millions of Colors+ option supports an embedded alpha channel, Millions of Colors doesn't support embedded alpha.

Depending on what the embedded movie alpha channel has been set to, you may need to make an additional setting in Final Cut. If the embedded alpha channel is blank or full off, then Final Cut may display the movie file as black frames. This is because it is using the blank alpha channel for display, and a full off alpha channel will cause the movie file to display as black. You should select the appropriate source movie and then change the Modify Item Alpha menu to Black or None/Ignore. Making this change to a movie file with a black or full off alpha channel will enable the image plane to be seen.

The previous section in this chapter on Alpha Channels discusses how to specify a specific embedded alpha channel output option.

Working With Time Particles for Motion Effects

Studio Artist's Paint Synthesizer has the ability to generate a series of individual paint strokes that have temporal continuity from frame to frame. The mechanism to do this is based on the notion of time particles.

A time particle is generated for each individual paint stroke in the first frame of an animation or movie. Each time particle keeps track of the path start location of its associated paint stroke. Each time particle can also have its own movement behavior. The characteristics of each time particles movement over subsequent frames in a movie sequence is determined by the parameters in the Time Particle control panel in the Paint Synthesizer.

In addition to a path start location, each Time Particle can also contain a complete paint path as well. This allows for animation effects that start with a paint sketch and then have the sketch blow apart or morph into a series of different paint sketches derived from different images or sequenced movie frames.

If Time Particles are active in the Paint Synthesizer patch, then they override the Path Start generator for positioning individual paint strokes for all frames after the first frame in a generated or processed movie. How many time particles are generated in the first frame and where they are positioned are a function of the Path Start parameters.

If Time Particles are off, then the Path Start parameters are always active for each frame. If a Paint Action Sequence is played manually (i.e.. not a part of a generation animation or movie process) or Action Painting is initiated, the Paint Synthesizer will always act as if it is generating the first frame (i.e.. the current Path Start parameters will determine the start points for the auto paint strokes).

The Time Particle section of the Paint Synthesizer chapter contains more information how to work with setting up Time Particles in the Paint Synthesizer.

Working With Movie Brushes in the Paint Synthesizer

Studio Artist's Paint Synthesizer has the ability to use a QuickTime movie as a Brush Source or a Background Texture. There are several different applications for movie brushes.

A movie brush can be designed to provide a rich set of individual textures or brush patterns. These can be used as raw material within the Paint Synthesizer to create dynamic paint tools. Interactive modulation parameters such as pressure or tilt can be used to index through the individual movie frames in real time while drawing.

Movie brushes can be generated automatically from folders or databases of still images. These sets of images can then be used to generate interactive photomontage paint tools and images.

The Paint Synthesizer also supports embedded alpha channels associated with movie brushes. Movie indexing can also track the timing in an output animation or movie file processing. This approach to painting allows for compositing multiple individual movie files in other generated or processed movies.

The new Movie Pixel Index Background Texture option in the Paint Synthesizer can be used to create amazing hatching and drawing effects. Each movie frame can store a specific hatching pattern associated with representing a specific luminance value. Pixel Index means that the movie frame indexing for the background texture is performed for each pixel as opposed to once for a background texture paint nib block.

Using Movie Brushes to Generate Compositing Effects

Suppose you have several small movie files you would like to combine together within a larger composite movie file. Movie brushes can be used to do this.

The Paint Synthesizer supports embedded alpha channels associated with movie brushes. It can use the embedded alpha channel as the Paint Fill source brush while Filling with the individual movie brush frame images. Each compositing movie file is specified as an individual paint Action in a Paint Action Sequence. Brush frame indexing can be based on the current output movie frame.

Using Movie Brushes to Generate Photo Montage Images

Studio Artist provides several features that can be used to automatically generate movie brushes from folders or databases of individual static images. These database movie brushes can then be used to generate photo montage images in real time based on perceptual mapping using Studio Artist's embedded visual modeling.

Several Photo Montage movie brush preset examples are provided in the paint Patch Preset category called "3.0 Tutorials".

Converting a Folder of Images into a Movie File

Automatically generating a movie brush is based on processing a folder of images with a Paint Action Sequence. The first step is to record an appropriate Paint Action Sequence. Open the Paint Action Sequence palette using the "Windows: Paint Action Sequence" menu command. Erase the current sequence and turn on recording.

Record setting the Canvas background to the Source Image by dragging the source image to the canvas. You should see an Action step appear in the Paint Action Sequence list titled "Set Canvas : Source Image". Turn off Paint Action Recording.

To generate a movie brush from a folder of images, use the 'Action: Process With Paint Action Sequence: Image to Movie...' menu command. A standard file dialog

will appear that you can use to select an image file from within the folder you wish to generate a movie brush from.

Select an image file and click OK. A canvas sizing dialog will then come up. Select the canvas size to be the brush size you would like for your movie brush. Remember that for interactive painting, the entire movie brush file (i.e., all of the individual frames in the movie brush) needs to be pre-loaded to memory, so try and keep your movie brush size small. Try something like 64x64 as an initial default size when experimenting.

Next, a second standard file dialog will appear. Use this dialog to name your output movie brush file. Press OK and Studio Artist will process each of the individual image files within the source folder and output them as subsequent frames in the movie brush file.

Making a Movie Brush from your Image Folder Movie File

Choose a paint patch you would like to edit to use your movie brush. As a starting point, try the “Tutorial: Movie Brush Starter” Paint Patch Preset.

Switch to the Paint Synthesizer Brush Source control pane. Use the ‘File: Paint Synthesize: New Movie Brush...’ menu command to select a new movie brush file. A standard file dialog will appear. Select the movie brush file you just generated and press OK. The individual frames of the movie brush will preload into memory.

Try painting a few strokes with the movie brush tool. Note how the paint tool moves through the individual movie frames as you draw. Now, switch the Frame Mod popup to RGB Mapping. Try painting a few strokes and notice how Studio Artist automatically chooses the particular movie frame that best represents the source color.

The Frame Modulation popup determines how the individual frames are chosen. Modulation can be based on interactive modulators such as pressure and tilt, or on perceptual modulators such as luminance, orientation, or color.

The Index popup chooses the particular indexing used in the modulation step. Load status determines whether the movie brush is preloaded into memory or drawn from disk. Preloading is best for interactive drawing. Drawing from disk is best for compositing large movie files.

Recording Your Painting Directly to Video

One of the coolest things about Studio Artist is watching it paint in real time to the screen. There are several different ways to record this live painting process to video.

On some computers you can output to S-video by mirroring the live display on the LCD screen to the video output. There are also various external video output interfaces you can get for your computer. The details vary according to the computer model and the io connections available on it.

Typically you would want to use the fullscreen display option available in the main Windows menu. You would adjust your canvas size to fill your computer screen, so that when it was in full screen display mode the canvas would completely fill the computer display.

Another approach is to use Studio Artist's built in movie stream functionality. Once you have opened a movie stream you can configure Studio Artist to output a frame after each action, PASEq cycle, Gallery Show cycle, or you can live stream frames at a fixed timer rate. You can use the File: Stream: Flags menu flags to specify when frames are automatically written to an open movie or image stream.

Auto Writing Movie Stream Frames into a Quicktime File

Studio Artist allows you to specify a specific autowrite timing for an open movie stream. This allows your real time painting to be streamed to an open movie stream while you paint or interactively warp. So, if you specified an autowrite frame timing of 10 frames per second, then a frame would be written to the open movie stream every 10th of a second as you paint.

You specify movie stream autowrite timing in the preferences dialog under the Movie tab. Other Stream settings that specify when frames are automatically written can be accessed in the File : Stream : Flags sub menu. In order for the timer autowrite

Chapter 13: Helpful Hints

Introduction

This chapter details a number of helpful Studio Artist hints and tips.

There are a number of different ways to approach Studio Artist in your work. Working at the preset level, you can get started generating art very quickly without getting into the details of the immense underlying technology and power that exists once you start exploring the Studio Artist interface in depth.

With the tremendous power to design an unlimited range of paint, image processing, and video effects comes a learning curve associated with understanding all of the individual editable parameters and operations modes associated with the program.

As you start to explore the overall interface and it's powerful editable parameters in depth you'll come to appreciate the amazing creative potential that is available to you in Studio Artist.

This chapter provides a number of sections that can help jump-start your digital creativity as well as provide some insight into how to utilize the amazing power and potential that lies within Studio Artist.

Left Brain vs Right Brain Work Strategies

Psychologists often describe certain tasks as being left-brain or right-brain tasks. While this notion of two brains in one head can be taken to extremes in the popular press or new age philosophies, there is something to this notion worth investigating in your overall workflow.

The human brain is divided into two hemispheres, and each of the hemispheres is biased for performing certain tasks. Similarly, you can often divide your Studio Artist work flow into two different areas that utilize very different parts of your brain.

Left brain tasks are described as being more language oriented or analytical in nature. This is because most of the brain processing associated with language is located in areas of the cortex that are located on the left side of the brain.

Right brain tasks are not associated with language and are typically more intuitive or holistic as well as being more visual in nature. Many book and studies have focused on utilizing the right brain for improving drawing skills. The thought is that if you draw with your left brain, the verbal nature of the left brain processing gets in the way of producing an accurate drawing. This is because the left brain is focusing on the verbal description of an object while the right brain is more focused on what it actually looks like.

Studio Artist workflow can usually be broken down into working on generating or editing new paint tools or graphic effects vs using these tools in a creative flow while working on an artistic project. Because the nature of building tools (left brain) vs using them (right brain) is so different, and because they really use different parts of your brain, you should consider focusing on one of the two as the focus for a particular work session.

Spend some work sessions devoted to building custom paint tools and organizing your work environment by arranging presets and favorites menus. Later, when you are in the

creative flow of a particular project you can focus on visual creativity rather than tool building.

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 color source, paint texture and brush characteristics. Your strategy should take into account how these parameters interact as well as the overall aesthetic paint look you are trying to achieve.

What are your goals? Are you designing a paint that will be drawn in real time 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? Are you interested in applying new paint to the canvas or modifying the existing canvas in some way.

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.

Sometimes you may want to break a particular stylistic effect into 2 different presets that work together to create the overall effect. For example, one preset might apply pigment to the canvas while another one simulates the effect of water washing over the canvas mixing the applied pigment with the existing colors on the canvas.

Other times your paint strategy might be working through how to combine a number of existing presets together to create an overall artistic effect. Again, the particular presets you use and how you order them in use can totally change the overall final effect.

The next section will focus on how to use a Paint Action Sequence to combine together several different paint tools and or image or texture processing effects to generate an art process that can be accessed later with the touch of a button.

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 visual aesthetics.

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, try scanning a real paper texture and load that into the Background Texture as an image texture. As a different approach, build a Paint Action that applies a random brush to the canvas with a random scan pattern. You could even 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.

All of these individual editing decisions and subsequent paint actions could be recorded as individual paint action steps in the overall paint action sequence. Then you could export the paint action sequence and save it in the PASEq preset folder. The next time you run studio artist, your new art process recorded as a paint action sequence will be available as a preset and can be accessed at the touch of a button.

Using Evolution to Generate New Paint Patches

You may want to start generating custom paint tools right away even though you have no real clue how the various paint synthesizer sections and editable parameters interact to create the final paint tool. You can still generate your own custom paint tools in total ignorance by utilizing controlled random evolution.

Studio Artist provides several ways to evolve new paint synthesizer patches from existing ones. There's a PaintSynth Evolution help page that contains dynamic command links for evolving new paint patches. This replaces the old Paint Evolution control panel in previous versions of Studio Artist.

You can randomly generate variations off of a single paint patch, as well as morph or mingle two different paint patches. The nice thing about directed evolution is that you can generate new presets from existing ones without an in depth understanding of how the Paint Synthesizer works internally.

Morphing linearly blends paint parameters between the 2 patch memories. Because morphing blends parameters, it can be used to generate new values that don't exist in either starting patch memory. Mingle combines parameters from either of the patch memories without changing the individual values. Mingle tends to generate less extreme parameter settings and correspondingly less junk. Morphing or mingling can either be randomly generated, adjusted with a slider, or modulated with any interactive modulation parameter (like pressure or tilt).

By choosing 2 different presets you find interesting and recording them two patch memories (Edit ;Paint Synthesizer :Patch Memory menus), you can record you own starting preset choices for preset evolution. Then press the mingle button in the Paint Evolution help page and instantly create your own custom presets. If you like one, export it to your Preset folder.

Using Layers to Visualize Paint Edits or Mix Paints

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 save a set of different colors in the Source Color Palette by option clicking the individual color squares in the Source Color Palette. You can import and export complete color palettes to disk to save you color choices or build custom palettes for different applications.

Or, you can transfer the entire Canvas to the Source with a menu command. You can then select colors from your mixed paint image, or you can use the settings in the Paint Source Offset control panel to load portions of the mixed paint image directly into the paint brush for painting with a mixed-paint texture.

Simulating Multi-Color Brushing Effects

Traditional painters can achieve remarkable multi-colored paint stroke effects by combining multiple dabs of different colored paint from a palette to a brush prior to painting a stroke on a canvas. These kinds of multi-color paint effects can easily be achieved within Studio Artist in a number of different ways depending on the particular aesthetic effects you are trying to generate.

You can either choose the particular colors you want to mix in an individual stroke manually or you can have Studio Artist automatically generate a second color derived using color theory from the current paint color. Lets assume you want to have each paint stroke consist of a 2 color gradient.

One approach would be to use a color gradient brush load derived from Fixed Color 1 and 2 as your paint fill setup fill from source. To manually choose the 2 colors for the color gradient for the stroke, go to the Fixed Colors control panel and set the 2 Color Sources to Fixed. The use the Source Area Color Picker to select your individual colors and option click the individual Fixed Color memory buttons to set them to the colors of your choice. Then draw your color gradient paint stroke.

To automatically generate the color gradient derived from your chosen source color, set the Fixed Color Color Source controls to Paint Path Color. The set Fixed Color 1 for 0 Random Start Color and 0 Offset. Setup the control for Fixed Color 2 to correspond to the derived color offset you desire for your color gradient.

Another approach to automatically generating a color gradient for MultiPen drawing is to use the Multipen Nib modulator for the Path Gradient in the Paint Color Modulate control panel. Choose the appropriate Gradient End option for the color gradient effect you are interested in generating.

The next section describes a technique to directly load the paint brush with a chunk of the source image like dipping it onto a paint palette.

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 Tracking 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.

Source keyframes in the layers window can be used to associate different source images with different layers. You can use layer resizing and repositioning to build a composite canvas consisting of different source objects placed in different positions within the overall image. Each of these objects in the overall final painting can be painted with their own associated source images. Source alpha could be utilized as well to mask the objects in the final painting.

This approach is similar to the historical work of Thomas Eakins whose work was profiled recently in the New York Times. Eakins would work off of multiple photographs to compose an overall image for a finished painting that consisted of pieces or objects from each of the individual source photos arranged into a final composite image. This same approach can be used in Studio Artist using multiple source images to build a final painting of a scene that does not exist in real life but which looks like it

was painted off of a single photograph.

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 it is 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.

Different Layers can be used to combine together different Source Images to generate a more complex composite image. This allows you to use individual objects in the different original source photographs to build up a final artistically composed composite source that you can then use to construct your final painting. You can use each Layers Alpha buffer to mask out portions of the individual source images you don't want to show through in the final composited image.

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 paint actions or other 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.

Studio Artist will toil away forever generating unlimited visual complexity if you want it to. Sometimes this is just what you want but other times a small number of paint strokes may provide just the effect you were looking for.

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. Try to put yourself in the mind set of an artist working with real media as you choose existing Presets or design your own while working.

For example, many paintings are generated using a series of different brush types and brush sizes that work together to create the final desired aesthetic effect in the finished painting. A large soft brush might be used to rough in the canvas background colors. A smaller hard brush might be used to define edge detail after the background color is roughed in.

You need to emulate this same approach when working in the digital realm by combining together Presets or editing them appropriately to simulate the effects of multiple brush sizes and different art techniques combining together to create a final image and finished piece of art.

As mentioned previously, you can use Studio Artist's Paint Action Sequences to record

a series of Paint Action autopainting steps and then access them later 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 automatic rotoscoping, motion animation or video effects. However, they are also of use for conventional 2D artists that just want to generate a final static image for printing or display.

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 that could be works of art in their own right.

Marcel Dechamp or the Futurists art movement are examples of artists that tried to convey the sensation of movement within static paintings. By using a series of motion frames from a video sequence as the source for your final 2D painting you can also explore these ideas in your work.

Load a source movie and start action painting. Then, stop the action painting and advance the source movie to a different frame image. Then start painting again. Repeat this process for several different source frames as you build up your final static painted motion image.

Or, 2D artists might want to try exploring new ground by taking a series of still paintings and using Studio Artist's morphing or other visual processing effects to create a single moving painting that animates between the different original static paintings in the series. This could open up a whole new creative world for you as well as provide another avenue for displaying your work to the public.

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 **"File :Stream :New Movie Stream..."** 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 **"File :Stream :Write Frame"** menu. When you are done with the last frame, use the **"File :Stream :Close Open Stream"** 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 final brush movie.

Use the **"Windows : Paint Action Sequence..."** 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: Default Color** menu to **"Source Image"**. You should see a **"Set Canvas : Source Image"** action step 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 “**Action :Process With Paint Action Sequence :Movie to Movie...**” 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 generates 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.

Once you have generated your custom brush movie, you can now import it into any paint patch by using the "**File : Paint Synthesizer : New Movie Brush**" or "**New Background Movie Texture**" menu commands. This menu command will bring up a file dialog that lets you select your custom brush movie and load it into the paint synthesizer.

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, pen tip rotation via the 6D Artpen, and the 4D mouse. Studio Artist supports all of these advanced features in a number of innovative ways.

Wacom Graphire tablets allow for interactive control via pen pressure. Wacom Intuos tablets allow for pen tilt and tilt orientation as well as pressure which makes them even more expressive when used with Studio Artist. Use of an Airbrush or 6D Artpen tool with the Intuos tablet adds another degree of interactive modulation.

Any of the Wacom interactive controls (pressure, tilt, pen orientation, tangential pressure, pen tip rotation, 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 400 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, tilt orientation, and tip rotation are also heavily integrated into the overall interface to define and rotate path curves or selection regions.

Intuos tablets can also support a second input device (another pen or a 4D mouse) and Studio Artist provides support for 2 handed input for additional channels of interactive modulation. See the Hint on 2-Handed Drawing for more information.

Once you start using interactive pen pressure, tilt, and tilt orientation you will find it hard to go back to drawing with a normal computer mouse. The range of expressive control that is available in the Studio Artist paint tools that use interactive pen pressure and tilt make the normal computer mouse seem clunky at best.

Chapter 14: Quick Tips

Introduction

This chapter details a number of specific Studio Artist quick tips. Quick tips are designed to answer a specific question with a short explanation.

If you run into a problem or have a specific question, you can look here first to see if there is an answer before diving into the user guide chapters dealing with specific parts of the interface in depth.

Each tip starts with a title associated with a specific topic or question. Then, a short explanation of that topic or answer to the question is provided.

Changing the Brush Size

The quick way is to use the b hotkey. Just press the b hot key, then mouse down in the canvas and drag an interactive marching ants line to specify the new maximum brush size, then mouse up.

Using option b as the hotkey will also rescale any other internal brush parameters such as textures or randomization to match the new brush size.

You also have the option of setting the brush size with a slider or edit field in the Paint Synthesizer. The maximum brush size is specified in the Brush Source control panel. You can set the horizontal and vertical dimensions of the source brush.

The actual brush size used for drawing is also a function of the controls on the Brush Modulation control panel in conjunction with the maximum size specified in the Brush Source control panel. The Brush Size Range dual slider specifies the range of possible brush sizes as a percent of the source brush size. When a size modulator is specified the brush size modulates between the minimum range size and the maximum range size. If no modulator is specified then the brush is the Source Brush size.

Erasing the Canvas

There's an **Erase** button located in the Operation Toolbar. Pressing it erases the canvas to the default color. You can change the default color using the **Canvas :Default Color** menu flags. The **Canvas :Set to Default Color** menu command is the same as pressing the **Erase** button in the Operation Toolbar.

Shift clicking the **Erase** button will perform a complete erase. This includes the RGB raster image, the alpha channel, the Blanking buffer, and the current bezier Path Frame. The **Canvas :Full Erase** menu command is the same as shift clicking the Erase button.

Changing the Eraser Preset

If you have a Wacom tablet, you can turn the pen over and use the erase tip to erase the canvas. The eraser tip switches the paint synthesizer settings to an erase patch while in use, and then switches the settings back to where you were originally when the pen is turned over again to the normal drawing side. You can also use the e hotkey when drawing to switch to the eraser if you are using a mouse for drawing.

You can use any preset you want as the erase patch. The settings are stored in the Pen Eraser memory, which is accessed via the **Edit :Paint Synthesizer :Pen Eraser** menu. Use the Record sub menu to record the current paint synthesizer settings into the Pen Eraser memory. Use the Playback sub menu to play back the Pen Eraser settings into the paint synthesizer.

Processing a Movie File

The quickest way to process a movie file is to first record a Paint Action Sequence that contains all of the individual processing or painting steps you want to apply to each movie frame. Or, you can choose an existing PASEq Preset. Then, run the **Action :Process With Paint Action Sequence :Movie to Movie...** menu command. It brings up a series of dialogs that let you choose the movie file you want to process, specify the size of the output movie file, and the name of the output movie file.

Studio Artist will then process each frame in the source movie file with all of the individual steps in the Paint action Sequence.

If you already have a loaded source movie, use the **Action :Process with Paint Action Sequence :Source to Movie...** menu command. This process command uses your existing source movie and canvas size for processing, so you only need to specify the output movie file and processing begins.

Read the Chapter on Movies for a more detailed explanation, since Studio Artist has extensive movie processing capabilities.

Selecting a Region

Choose the Selection Operation mode to select a region to use for masking or color fills. You can use the Operation main menu to do this.

Or, you can always use the 'cmnd 6' hot key command to switch back and forth to the Region Selection operation mode.

Or, you can use the 'q' hotkey and mouse down into the canvas to immediately drop into Region Selection mode, do a selection, and then revert back to where you were in the overall interface when you mouse up.

Moving or Scrolling the Canvas With a Hand Tool

Use the 'h' hotkey to scroll the Canvas with a Hand tool icon. Press the 'h' hotkey, then mouse down in the Canvas and drag scroll the Canvas to a new scroll position within the overall scrollable view.

Masking Painting With the Current Region Selection

Use the Mask checkbox in the Operation Toolbar to turn on and off Paint Masking. The mask will be the current region selection if the Mask popup is active. You can also use the 'cmd Y' hotkey to toggle masking on and off.

Adjusting the Paint Brush Transparency

Go to the Paint Synthesizer Paint Fill Apply control panel. Any of the Composite options except Replace will have a blend % slider, which you can use to adjust the overall blend of the compositing. This is essentially the equivalent of adjusting paint transparency, the difference being that the effect can build up by repeated overdrawing.

You can choose the Transparent Composite option if you want the absolute transparency and then adjust the Blend % control accordingly.

There is also an additional Transparency % parameter available in version 4's Paint Fill Apply control panel, which allows for adjusting transparency without changing the existing composite setting.

Navigating the Studio Artist Interface

You can use the Operation main menu and the appropriate submenus within it to immediately navigate to any control panel in the Studio Artist interface.

There are also a number of hotkey commands specified in the 'Operation : Go To' sub menus that let you toggle quickly back and forth to different editing areas of the Studio Artist interface. Examples would include cmnd 6 to toggle back and forth to region selection, and cmnd 5 to toggle back and forth to bezier editing.

Generating Bezier Paths from the Vectorizer Output to Paint Using the Paint Synthesizer

Activate the 'Path : Path Layer Record Options : Vectorizer' menu flag. Then, when you run the Vectorizer the vector regions generated are recorded in the current bezier path frame.

If you activate the 'Erase Before Action' menu flag, then the existing bezier path frame will be erased before the Vectorizer bezier output is recorded. Or, you could add an erase path layer command to a PASEq before the Vectorizer step.

Changing the Number of Frames in the Timeline

You change the overall number of frames in the PASEq timeline using the # of keyframes numeric edit file in the toolbar at the top of the PASEq palette.

Getting Rid of Flicker in Paint Animations

Perceived flicker or smoothness in a painted animation or processed video is determined by the temporal continuity or lack of it from frame to frame. Temporal continuity from frame to frame leads to a smooth animation. Lack of temporal continuity leads to flicker in the resulting animation.

There are a wide variety of techniques you can use to introduce temporal continuity into your paint animations. The simplest approach is to add some form of overdrawing on the existing frame image.

You can also process or modify the existing frame in some fashion prior to the overdrawing. Fading the existing canvas is probably the simplest approach. Adding feathering can generate a more artistic type of fade effect. Warping or melting the existing canvas is another interesting approach.

All of these various techniques for adding temporal continuity to a paint animation can easily be added to your existing Paint action Sequence. Usually this involves adding an extra step or two to the beginning of the PASEq.

If you already have an existing movie that flickers you can post process it to reduce flicker as well. The simplest approach is to use the Fixed Image Ip Op to add a percentage mix of the previous frame to the current frame. For example, set the mix to 80 % with the Source Routing set to Source Image if you want 20 % of the previous frame to be mixed with the current frame.

This can be recorded in a PASEq as a 1 step PASEq that you can then use to post process your flickering original movie.

Speeding up Paint Stroke Drawing

The simplest thing to try is to go to the Path Application control panel in the Paint Synthesizer and increase the Spacing % parameter. This will increase the spacing between individual paint nibs, and can dramatically speed up drawing speed for a given preset.

If your paint patch makes heavy or multiple usage of a computational background texture for modulation, consider switching to other modulation sources or removing that modulation all together.

Some image processing brush load algorithms can run slow for large brush sizes. You might consider switching to other faster algorithm settings if possible.

There is an initial lag when you first start drawing with a paint path associate with pre-computing the source brush cache. The size of the source brush cache is a function of the # of brush sizes times the # of brush orientations. Try reducing either the # of size and/or the # of rotations to speed things up.

If using a Geodesic Brush Type, try decreasing the Geo Max Count or Geo Iterations parameter settings.

The vector render technique and the AntiAlias Solid Brush Type can draw very quickly, so if you have a preset that matches the paint look they can achieve consider switching from raster drawing to vector drawing.

There is a Throttle Speed parameter in the Miscellaneous control panel that can be used to slow down Studio Artist drawing speed. This is useful for some live visual performance situations. Make sure this parameter is set to off for maximum drawing speed.

Saving a Preset You Like in a Favorites Memory

You may be attracted to using certain presets often in your work. If so, you can save them in your Preset Favorites for quick and easy access when working. Favorites can be accessed in the main Preset palette, or via the compact Favorites Preset Toolbar.

You can drag and drop the current preset icon to the Favorites Preset Toolbar and that preset will be copied into the current Favorites category.

Then, if you want to use that preset again you can just click the associated icon in the Favorites Preset Toolbar it is stored in.

Adding or Changing a Preset Help Message

You can save a text help message in a preset that can contain information on how to use it. For example, many of the factory preset contain help messages that may specify how an interactive pen changes the way it draw.

To read a preset's help message, click on the preset help icon, which is the ? icon in the preset control panel.

To edit an existing preset help message or to add you own, simply option click the preset help icon. An editing dialog will come up that allows you to customize your own preset help message.

Paint Strokes that Auto Regionize

Sometimes you may want your paint strokes to fill in or cross hatch regions that reproduce the source image as opposed to drawing individual paint strokes all over the canvas.

There are several Path Start generators that will auto-regionize the source image. These can be combined with the Path Shape Type called Path Start Regionize to auto generate paint strokes that try to fill in automatically computed local regions using crosshatching or other region fill patterns. There's much more information on path start regionization in the Paint Synthesizer chapter.

Quick and Easy Paint Synthesizer Macro Edits

There are a number of different paint synthesizer macro edit menu commands located in the **Paint Synth Macro Edit** help page accessed in the Help palette. Each of these active commands provides a way to quickly perform different edits to the internal paint synthesizer parameters without having to get under the hood of the paint synthesizer.

Generating Flat Cartoon Style Effects

There are a number of different approaches to generating flat cartoon style images or animations. The easiest approach is to use the Vectorizer, which can generate a wide range of different flat cartoon looks.

The Color Simplify, Simplify, and Watershed Regionize Image Processing effects also will generate flat cartoon looks. You can also use the Paint Synthesizer's Region Fill as Brush pen mode and it's various parameters to generate flat region paint effects.

There are many prebuilt factory PASEq presets available that generate a wide range of

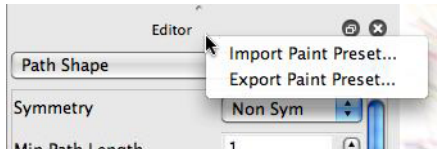
different cartoon effects.

Chapter 15: Menu Commands

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

Most of the chapter outlines in detail the various Studio Artist main menus, as organized in the main menu bar at the top of the screen. However, some of these main menu commands may also be accessible through contextual menus as detailed below.

Contextual Menus

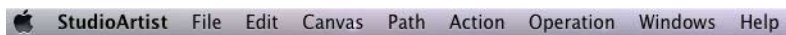


In addition to the main program menus located in the Macintosh menu bar at the top of the screen, there are also various contextual menus accessible throughout the Studio Artist interface. Popup contextual menus provide quick access to frequently used menu commands associated with a particular section of the Studio Artist interface.

Like all Macintosh contextual menus, you access them by holding down the control key and mousing down in a particular interface pane. Only menu commands associated with that particular interface section will come up in the popup contextual menu.

You can see if a contextual menu is available in a particular Studio Artist panel by holding down the control key and moving the mouse over to that interface pane. The cursor will change to the contextual menu indicator cursor is a popup contextual menu is available for that interface pane.

Main Menus



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

File Edit Canvas Path Action Operation Windows Help

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

File

Menu commands associated with all file access are located here. This includes the Source Image, Canvas, Movies, all Preset Patch import and Export, Paint Synthesizer Brushes and Textures, etc. Movie or Image Streams menus are accessed here. Source Settings menu flags located here. Printing menus are also accessed here.

Edit

Menu commands associated with editing selected objects are located here. Specific menu commands associated with editing the Presets, Paint Synthesizer, Source Color Palettes, and Source Color Gradients are also located here.

Canvas

Menu commands associated with the main draw Canvas are located here. This includes access to resizing, Layer, Movie Layer, Alpha, Selection, Blanking, Onion Skin and default background color commands.

Path

Menu commands associated with Bezier Paths and the current Bezier Path Frame are located here.

Action

Menu commands associated with Studio Artist's Actions and Paint Action Sequences are located here. This includes the Paint Action Sequence window and its associated commands as well as the History Sequence window and its associated commands. Commands associated with PASEq movie processing or batch processing of folders of images are also located in this menu in the Process section. Commands associated with EPS or SVG vector file generation from Action Commands are also included here.

Operation

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

Windows

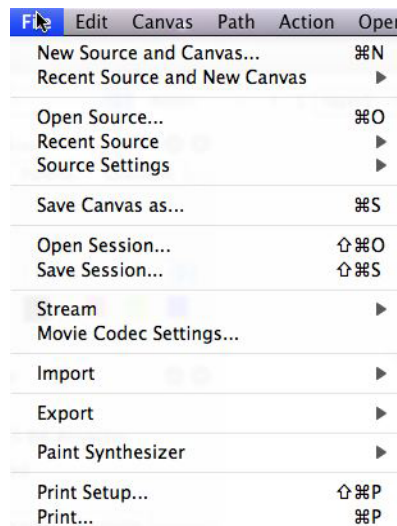
The Windows menu commands provide access the different Studio Artist palettes and tool bars. You can also toggle full screen view on or off, and access the user layout memories which can be used to save and restore different workspace configurations.

Help

The Help menu allows for quick access to Studio Artist's online help. Online help is html based and will come up in your default browser.

File

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



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

New Source and Canvas...

This menu command allows you to choose a new Source Image and define a new working Canvas. Your existing Canvas will be deleted 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.

Recent Source and New Canvas

This menu command allows you to open a new source and canvas from a previous image you recently opened in Studio Artist. Your last 10 previously opened source images are shown as sub menu options to choose from.

Open Source...

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.

The Source Image can either be a static image or a Quicktime movie.

Recent Source

This menu command allows you to open a new source from a previous image you recently opened in Studio Artist. Your last 10 previously opened source images are shown as sub menu options to choose from.

Source Options

Provides access to the following source settings sub menus:

:Movie Loop Action Advance

Menu flag. When checked a loaded source movie advances to the next frame after a loop action or PASEq animation cycle is completed. When unchecked the source movie will not frame advance at the end of the loop action cycle.

:Movie Loop Play

Menu flag. When checked a playing source movie will endlessly loop until the user presses the stop button in the source movie transport area (or presses the spacebar). When unchecked a playing source movie will stop when it gets to its end frame.

:Synch Timeline Frame Count

Menu flag. When checked the PAsEq timeline's frame count is always updated to reflect the source movie frame count.

:Live Video Capture Now

This menu command captures a live video frame as the current source image when executed.

:Live Video Preview Manual Capture

Menu flag. When checked the source image preview is switched to live video preview. The live video input will be displayed in the source area until you click in the source area, which captures a live video still frame. Clicking the source area again will start the live video preview and manual capture cycle over. Turn the menu flag off when you want to stop live video preview manual capture.

:Live Video Loop Action Advance

Menu flag. When checked a live video frame is captured to the source image after a loop action or PAsEq animation cycle is completed. When unchecked the source image will not capture live video at the end of the loop action cycle.

Save Canvas 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 navigation dialog.

Open Session...

This menu command allows you to open a Studio Artist session file. A session file allows you to save and restore the state of the entire Studio Artist interface (except for the Paint Action Sequence and History windows which need to be saved by doing a Paint Action Sequence or History export).

Save Session As...

This menu command allows you to save a Studio Artist session file. Saving a session file saves the complete state of the studio artist interface including all layers, all keyframes, the current paint synth settings, etc. The only exception is that the current Paint Action Sequence and History Sequence are not currently saved in a session file. You can save them manually using the appropriate file export commands.

Stream

Streams provide an alternative approach to generating movie or sequences of image files from Studio Artist. Once a stream is opened you can manually output individual frames, or you can run a PASEq animation cycle to output a complete animation to the open stream.

Streams are also a way to generate movies that capture real time drawing in Studio Artist. This is done by setting the appropriate auto-write flags. You can specify auto writes at the end of processing operations, or based on a auto-write timer value specified in the Movie preferences.

This menu accesses the following sub menu commands associated with opening a stream, manually outputting frames, or controlling it's auto-write behavior:

:New Movie Stream...

This command allows you to create a new open movie stream. Use this command when you want to generate a new movie file from scratch.

After you execute this command, you can save individual Canvas frames to the open movie file. Or, you can generate and save frames automatically from Timeline Operations like Paint Animations, Warping, Morphing, or Paint Action Sequence Animations.

A new movie stream preference option also allows a frame to be automatically written according to a timer at specified time increments while you interactively paint or warp the canvas.

:New Image Stream

This command allows you to create a new open frame image stream. Use this command when you want to generate a series of new frame image files from scratch. Image Streams are the same as Movie Streams with identical functionality in Studio Artist except that the individual frames in the stream are saved as separate image files rather than as frames in one Quicktime movie file.

After you execute this command, you can save individual numbered Canvas frames to the open image stream. Or, you can generate and save numbered frames automatically from Timeline Operations like Paint Animations, Warping, Morphing, or Paint Action Sequence Animations.

:Close Open Stream

This menu command closes off an open movie or image stream. A file associated with a movie stream must be closed before it can be opened in another program.

:Write Frame

When executed writes the current canvas out as a new frame in the open stream.

:Flags :Enable Always AutoWrite

Menu flag. When turned on a timer based frame auto-write will occur until the menu flag is turned off. The automatic frame write timing is based on the movie preferences Movie Stream AutoWrite FPS setting. With this auto-write option frames are dumped continuously all the time, even if you are doing nothing in Studio Artist.

:Flags :Enable Gated AutoWrite

Menu flag. When turned on a timer based frame auto-write will occur until the menu flag is turned off. The automatic frame write timing is based on the movie preferences Movie Stream AutoWrite FPS setting. With this auto-write option frames are only dumped when you are actively doing something in Studio Artist. When you are doing nothing the gate kicks in and frame writes are inhibited until you start doing something again.

:Flags :Enable Write on Op End

Menu flag. When turned on a frame is written at the end of an executed operation.

:Flags :Enable Write on PASEq Cycle

Menu flag. When turned on a frame is written at the end of an executed PASEq cycle.

:Flags :Enable on Gallery Show Cycle

Menu flag. When turned on a frame is written at the end of an executed Gallery Show cycle.

:Flags :Use Alpha Gen Movie Pref

Menu flag. When turned on the stream will use the movie alpha generation preference settings to add an embedded alpha channel to the stream's frame output. Otherwise the stream output does not have an embedded alpha channel.

Movie Codec Settings...

This menu opens a movie compression preferences dialog. In it you can set the default movie compression codec settings and a default FPS (frames per second) timing that can be used for output movie frame timing (if you are not passing through a source movies frame timing).

--

Import

This menu command accesses the following sub menu commands associated with importing various file contents into Studio Artist:

:Import Paint Preset...

This menu command allows you to import a new Paint Synthesizer preset from a preset file on your hard disk. A paint preset is a complete set of Paint Synthesizer parameters. Choose your new Paint preset from the hard disk with the Standard File dialog. After you click OK, the imported paint preset will be loaded as the current Paint Preset.

:Import Image Operation Preset..

This menu command allows you to import a new image operation preset file from your hard disk. An image operation preset is a complete set of image operation parameters. Choose your new image operation preset from the hard disk with the Standard File dialog. After you click OK, the imported preset will be loaded as the current image

operation preset.

:Import Temporal Image Operation Preset..

This menu command allows you to import a new temporal image operation preset file from your hard disk. A temporal image operation preset is a complete set of temporal image operation parameters. Choose your new temporal image operation preset from the hard disk with the Standard File dialog. After you click OK, the imported preset will be loaded as the current temporal image operation preset.

:Import Texture Synthesizer Preset...

This menu command allows you to import a new texture synthesizer preset from a preset file on your hard disk. A texture synthesizer preset is a complete set of texture synthesizer parameters. Choose your new texture synthesizer preset from the hard disk with the Standard File dialog. After you click OK, the imported texture synthesizer preset will be loaded as the current texture synthesizer preset.

:Import Vectorizer Preset...

This menu command allows you to import a new vectorizer preset from a file on your hard disk. A vectorizer preset is a complete set of vectorizer parameters. Choose your new vectorizer preset from the hard disk with the Standard File dialog. After you click OK, the imported vectorizer preset will be loaded as the current vectorizer preset.

:Import MSG Preset...

This menu command allows you to import a new MSG preset from a file on your hard disk. A MSG preset is a complete modular image processing effect. Choose your new MSG preset from the hard disk with the Standard File dialog. After you click OK, the imported MSG preset will be loaded as the current MSG preset.

:Import DualMode Preset...

This menu command allows you to import a new dual mode paint preset from a file on your hard disk. A dual mode preset is a complete set of dual mode paint parameters. Choose your new dual mode preset from the hard disk with the Standard File dialog.

After you click OK, the imported dual mode preset will be loaded as the current dual mode preset.

:Import Paint Action Sequence Preset...

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

:Import History Sequence...

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

:Import Color Palette...

This menu command allows you to import a new Source Color Palette from a file on your hard disk. Choose your new Color Palette from the hard disk with the Standard File dialog. After you click OK, the imported colors will be the new Source Color Palette.

:Import Color Gradient...

This menu command allows you to import a new Source Color Gradient from a file on your hard disk. Choose your new Color Gradient from the hard disk with the Standard File dialog. After you click OK, the imported colors will be the new Source Color Gradient.

:Import Bezier Path Frame...

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

:Open New 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 current Source Image will not be changed. 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, drag the source image into the canvas. The new Source Image will be loaded into the existing working Canvas.

:Open Movie as New Canvas Movie...

This menu command allows you to choose a Quicktime movie file and automatically set up a new working Canvas where the selected movie file is loaded as a Movie Layer. The new working Canvas will be resized to the dimensions of the imported movie. You will be prompted to save your existing work if you haven't already.

Export

This menu command accesses the following sub menu commands associated with exporting to an external file:

:Export Paint Preset...

This menu command allows you to export a new paint synthesizer preset to your hard disk. A paint synthesizer preset is a complete set of paint synthesizer parameters. Choose a name and location for your new paint preset 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.

:Export Image Operation Preset...

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

:Export Temporal Image Operation Preset...

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

:Export Texture Synthesizer Preset...

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

:Export Vectorizer Preset...

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

:Export MSG Preset...

This menu command allows you to export a new MSG preset to your hard disk. A MSG preset is a complete MSG modular image processing effect. Choose a name and location for your new MSG preset on the hard disk with the Standard File dialog. Clicking OK will save the current MSG preset to disk.

:Export DualMode Preset...

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

:Export Paint Action Sequence Preset..

This menu command allows you to export the current paint action sequence to your hard disk as a paint action sequence preset file.

:Export History Sequence...

This menu command allows you to export the current history sequence to your hard disk. The history sequence is stored in a paint action sequence preset file.

:Export Color Palette...

This menu command allows you to export a Source Color Palette to a file on your hard disk. Choose a name and location for your new Color Palette file on the hard disk with the Standard File dialog. Clicking OK will save the current Source Color Palette settings to the hard disk as a file.

:Export Color Gradient...

This menu command allows you to export a Source Color Gradient to a file on your hard disk. Choose a name and location for your new Color Gradient file on the hard disk with the Standard File dialog. Clicking OK will save the current Source Color Gradient settings to the hard disk as a file.

:Export Bezier Path Frame...

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

:Update Old Preset Factory Library

This menu command transverses the entire factory preset library, importing the preset files and then exported in place as updated version 4 preset files. Any old presets that you wish to use on windows machines with Studio Artist 4 need to be updated to version 4 preset files.

:Update Old Preset Folder...

This preset brings up a standard file dialog that lets you select a folder. All of the presets in the folder are then automatically imported and then exported in place as updated version 4 preset files. Any old presets that you wish to use on windows machines with Studio Artist 4 need to be updated to version 4 preset files.

Paint Synthesizer

This menu accesses the following sub menu commands associated with file access for the Paint Synthesizer:

: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 in a memory cache.

: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 in a memory cache.

: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 control panel's “Texture Type” popup will be switched to “Image” and your new Image Texture will be loaded as the active Background Image Texture.

:New Background Movie Texture ...

This menu command allows you to choose a new Paint Synthesizer Background Movie Texture. Choose your new Movie Texture from the hard disk with the Standard File dialog. After you click OK, the Background Texture control panel's "Texture Type" popup will be switched to "Movie" and your new Movie Texture will be loaded as the active Background Movie Texture.

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.

This print menu prints the raster canvas. You can alternatively use the Action: Generate SVG: Print with Paint Action Sequence menu to directly print from the vector information generated during the SVG generation process.

The following menus are located in the File menu when running Studio Artist on windows machines. On Apple computers they are respectively located in the Apple and StudioArtist menus.

Preferences

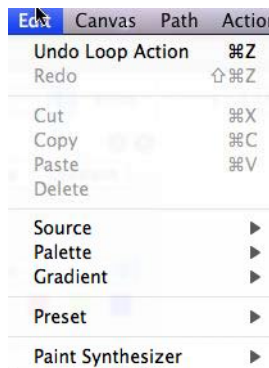
This menu brings up the main Studio Artist preferences dialog.

Quit

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

Edit

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



The standard editing commands (Copy, Paste, etc.) are context sensitive 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. After an interface element is made active, then the menu commands associated with it will become active.

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

This menu command allows you to Undo your last Studio Artist operation.

You can set the number of levels of undo in the general tab of the preferences dialog.

You can also use your Session History to implement a form of unlimited Undo. The History Sequence palette (accessible from the Windows menu) allows you to record, play back and edit your entire Studio Artist recorded editing history.

Redo

Allows you to redo your existing levels of undo.

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.

Source

:Source Color...

This menu brings up a standard source color picker dialog you can use that provides more detailed options for specifying the current source color.

Palette

This menu accesses the following sub menu commands associated with modifying the

Source Color Palette:

:Generate from :Source Image

This menu command allows you to generate a new Source Color Palette that best represent the colors in the Source Image.

:Generate from :Canvas Image

This menu command allows you to generate a new Source Color Palette that best represent the colors in the Canvas Image.

:Generate from :Selected Canvas Image

This menu command allows you to generate a new Source Color Palette that best represent the colors in the selected area of the Canvas Image.

:Generate from :Source Gradient

This menu command allows you to generate a new Source Color Palette that best represent the colors in the Source Gradient.

:Randomize Source Color :Lum Saturation

This menu command allows you to generate a new Source Color Palette randomly mutated from the current Source Color. The randomization will be based on randomizing the luminance and saturation of the current source color

:Randomize Source Color :Opponent

This menu command allows you to generate a new Source Color Palette randomly mutated from the current Source Color. The randomization will be based on an opponent color mixing scheme keying off of the existing Source Color.

:Randomize Source Color :TriOpponent

This menu command allows you to generate a new Source Color Palette randomly mutated from the current Source Color. The randomization will be based on an tri-

opponent color mixing scheme keying off of the existing Source Color.

:Randomize Source Color :Analogous

This menu command allows you to generate a new Source Color Palette randomly mutated from the current Source Color. The randomization will be based on an analogous color mixing scheme keying off of the existing Source Color.

:Randomize Source Color :MidLuminance

This menu command allows you to generate a new Source Color Palette randomly mutated from the current Source Color. The randomization will be based on an mid-luminance color mixing scheme keying off of the existing Source Color.

:Randomize Source Color :SplitOpponent

This menu command allows you to generate a new Source Color Palette randomly mutated from the current Source Color. The randomization will be based on an split-opponent color mixing scheme keying off of the existing Source Color.

:Sort by :Color Distance

This menu command allows you to rearrange the existing Color Palette with a sort by color distance.

:Sort by :Luminance

This menu command allows you to rearrange the existing Color Palette with a sort by luminance value.

:Sort by :Hue

This menu command allows you to rearrange the existing Color Palette with a sort by hue value.

:Sort by :Saturation

This menu command allows you to rearrange the existing Color Palette with a sort by saturation value.

Gradient

This menu accesses the following sub menu commands associated with modifying the Source Color Gradient:

:Generate from :Source Image

This menu command allows you to generate a new Source Color Gradient that best represent the colors in the Source Image.

:Generate from :Canvas Image

This menu command allows you to generate a new Source Color Palette that best represent the colors in the Canvas Image.

:Generate from :Source Palette

This menu command allows you to generate a new Source Color Gradient from the current Source Color Palette.

:Generate from :Source Color Opponent

This menu command allows you to generate a new Source Color Gradient from the current Source Color and its Opponent Color.

:Generate from :Source Color TriOpponent

This menu command allows you to generate a new Source Color Gradient from the current Source Color and its Tri-Opponent Colors.

:Generate from :Source Color Analogous

This menu command allows you to generate a new Source Color Gradient from the current Source Color and its Analogous Color.

:Generate from :Color Mem 1-2

This menu command allows you to generate a new Source Color Gradient from the Source Color Memories 1 and 2 (left most).

:Randomize :Index

This menu command allows you to randomize the indexes of the Source Color Gradient.

:Sort by :Color Distance

This menu command allows you to rearrange the existing Color Gradient indexes with a sort by color distance.

:Sort by :Luminance

This menu command allows you to rearrange the existing Color Gradient indexes with a sort by luminance value.

:Sort by :Hue

This menu command allows you to rearrange the existing Color Gradient indexes with a sort by hue value.

:Sort by :Saturation

This menu command allows you to rearrange the existing Color Gradient indexes with a sort by saturation value.

: Sort by :Flip Index

This menu command allows you to reverse the indexes of the Source Color Gradient.

Preset

This menu accesses the following sub menu commands associated with the current

Preset:

:Update Current Preset Icon

This command replaces the current Preset icon image with the current visual contents of the Canvas. Use this command to personalize favorite Preset icons to an image of your choice.

:Make New Favorites Category

This command is used to make a new custom preset Favorites category.

:Current Preset Command tag to Clipboard

This command automatically generates a html command tag that loads the current preset and places the command tag text on the clipboard. You can then switch to the html editor of your choice and paste the command tag into a url link in a html help page you are editing. Active tags can be used in html help displayed in the Studio Artist help browser to run commands in Studio Artist when pressed. The generated active tag will load the current preset when pressed. This is a way to generate custom html help pages for presets that can include an active link that loads the preset when pressed.

:Retarget StudioArtist Folder

This command allows you to retarget where Studio Artist looks for preset files. This allows for the possibility of having multiple Studio Artist folders. When you run this command, a standard file dialog comes up that lets you choose a new target Studio Artist folder. Your target Studio Artist folder should contain the normal contents of the main Studio Artist folder (Preset, Brush).

Paint Synthesizer

This menu allows access to the following submenus.

Note that these submenu commands provide access to the paint synthesizer memory buttons available in previous versions of Studio Artist.

:Pen Eraser

These menu commands allow you to record or playback the contents of the current pen eraser memory.

:Patch Memory 1**:Patch Memory 2****:Patch Memory 3****:Patch Memory 4**

These menu commands allow you to record or playback the contents of the associated paint patch parameter memory.

:Fixed Color 1

:Fixed Color 2

These menu commands allow you to record or playback the contents of the associated fixed color memory.

:Path Memory 1

:Path Memory 2

These menu commands allow you to record or playback the contents of the associated paint path parameter memory.

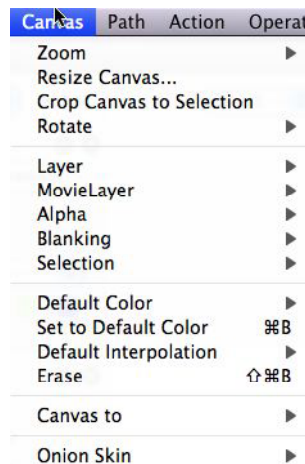
:Brush Memory 1

:Brush Memory 2

These menu commands allow you to record or playback the contents of the associated paint brush parameter memory.

Canvas

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



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

Zoom

This menu accesses the following sub menus associated with adjusting the canvas view magnification:

:Zoom Out

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

:Zoom In

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

:Zoom Full Out

This menu command allows you to zoom out all the way your view of the current Canvas.

:Zoom Full In

This menu command allows you to zoom in all the way your view of the current Canvas.

:Zoom to Fit

This menu command zooms the canvas to fully fit the available canvas space.

:Zoom to Specify...

This menu command brings up a dialog that lets you specify an arbitrary magnification ratio.

Resize Canvas...

This menu command brings up a dialog that allows you to re-size the Canvas to a different size and or resolution.

You can re-size the existing Canvas image via a specified image interpolation algorithm as well as rerender the existing PASEq or History Sequence and it's associated path and paint synthesizer settings. Playing back the rerendered PASEq or History Sequence will re-execute all of your recorded operations at the new resolution. This is a way to repaint your new sized Canvas with increased detail.

Layer

This menu access the following sub menus that are associated with canvas layers:

:New Layer

This menu command creates a new layer.

:Current View as New Layer

This menu command takes a snapshot of the current canvas view and then places that snapshot image into a new layer.

:Flatten All Layers

This menu command flattens the layer stack into a single layer.

:Capture View to Current Layer

This menu command takes a snapshot of the current canvas view and then inserts that snapshot image as the current layer's image content.

:View All

This menu flag toggles view all mode on (checked) or off (unchecked). When view all mode is active, then the entire layer stack is composited to generate the canvas view. When view all mode is off, the current layer only is displayed in the canvas view.

:Paint Mask Type: Paint**:Paint Mask Type: Path****:Paint Mask Type: Litho**

These menu flags allow you to set the default masking type. The current selection is used for determining the masking, but masking will not take place unless the Mask Status flag is enabled.

Paint masking means the mask clips the paint brush nib. Path masking means the paint path is masked but complete paint brush nibs are drawn. This can lead to a more natural looking masked painting. Litho masking clips the paint brush nib for the first part of dual fill algorithms but allows the Alg2 nibs to be unmasked. This can be used to simulate rubbing an inked litho plate, where the first fill algorithm lays down masked

paint but the second algorithm then allows the masked paint to be smeared or rubbed.

:Mask Status

This menu flag turns selection masking on or off. Note that how the mask is used is determined by the default Paint Mask Type specified above.

Movie Layer

This menu access the following sub menus that are associated with canvas movie layers:

:Convert to Movie Layer...

This menu command converts an existing canvas layer into a movie layer. A standard file dialog is brought up that allows you to specify the name and location of the movie file that will be associated with the new movie layer. After you press the Ok button then the existing image layer will be converted into a movie layer and the existing canvas image will be the first frame of the new movie associated with this new movie layer.

:New Movie Layer...

This menu command creates a new movie layer. A standard file dialog is brought up that allows you to specify the name and location of the movie file that will be associated with the new movie layer. After you press the Ok button a new movie layer will be constructed that references the new movie file you specified.

:Open Movie as New Layer...

This menu command allows you to open an existing movie as a new movie layer. A standard file dialog is brought up that allows you to select an existing movie file. After pressing Ok this movie file will be loaded into a new movie layer.

The existing movie file must be the same size as the existing canvas or the new movie

layer will not be generated.

:Save Flattened Canvas Movie as...

This menu command flattens the current canvas movie layer. Flatten means that a new fully compressed movie file is generated using any frame edits that have been generated from recording, inserting, or deleting frames while working in Studio Artist.

:Convert to Image Layer

This menu command converts the current movie layer into an image layer. The current frame image in the movie layer is used as that layer's content.

...

:Record to Existing Frame

This menu command records the current movie layer's image into the current frame of it's associated movie file.

:Insert as New Frame

This menu command inserts the current movie layer's image as a new frame in it's associated movie file.

:Insert as N New Frames...

This menu command inserts the current movie layer's image as N new frames in it's associated movie file..

:Delete Existing Frame

This

...

:Settings :Loop Play

This menu flag specifies whether movie layers will loop when played (checked) or not (unchecked).

:Settings :Advance on Record

This menu flag specifies whether a movie layer will auto frame advance after recording a frame (checked) or not (unchecked).

Alpha

This menu access the following sub menus that are associated with canvas alpha support:

:Enable for View

This menu flag turns alpha view for the canvas display on (checked) or off (unchecked).

:Set to :Full Off

This menu command sets the current layer alpha channel full on (sets it to 0).

:Set to :Full On

This menu command sets the current layer alpha channel full on (sets it to 255).

:Set to :Selection

This menu command sets the current layer alpha channel to the current selection image.

:Set to :Source Alpha

This menu command turns the current layer alpha channel to the alpha channel of the source image.

:Initialize :Full On

This menu flag sets the default initial state for a new layer's alpha channel full on (sets it to 255).

:Initialize :Full Off

This menu flag sets the default initial state for a new layer's alpha channel full off (sets it to 0).

:Background :Black**:Background :White****:Background :Gray**

These menu flags sets the default solid color background that the canvas layers sit on top of when alpha is enable for view.

...

:Paint Synth Alpha Enable

This menu flag turns paint synthesizer drawing into the canvas layer's alpha channel on (checked) or off (unchecked)

Blanking

This menu accesses the following sub menu commands associated with resetting the current Blanking frame:

:Initialize

This menu command resets or erases the Blanking Frame.

:Set to Canvas

This menu command allows you to set the Blanking Frame to the contents of the current Canvas.

:Set to Source Edges

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

Selection

This menu accesses the following sub menus associated with the current region selection:

:Set to :Full Off

This menu command allows you to set the Current Selection Region to full off (0).

:Set to :Full On

This menu command allows you to set the Current Selection Region to full on (255).

:Set to :Canvas

This menu command allows you to set the Current Selection Region to the luminance of the current Canvas Layer image.

:Set to :Canvas Alpha

This menu command allows you to set the Current Selection Region to the alpha channel of the current Canvas Layer Image.

:Set to :Source

This menu command allows you to set the Current Selection Region to the contents of the current Source Image.

:Set to :Source Alpha

This menu command allows you to set the Current Selection Region to the alpha channel of the current Source Image.

:Set to :Regionized Source

This menu command allows you to set the Current Selection Region to a regionized calculation of the current Source Image. Regionized selections use different grayscale levels to represent different select regions. In this case, the different selection regions will represent different visual regions in the Source Image that Studio Artist calculates.

:Set to :Blanking

This menu command allows you to set the Current Selection Region to the contents of the current Blanking Frame.

:Set to :Bezier Frame

This menu command allows you to set the Current Selection Region to the individual selection regions generated from the Bezier paths in the current Path Layer.

:Set to :Selected Bezier

This menu command allows you to set the Current Selection Region to the individual selection region generated from the currently selected Bezier path in the current Path Layer.

:Invert

This menu command allows you to invert the Current Region Selection.

:Feather

This menu command allows you to smooth or feather the Current Region Selection.

:Expand

This menu command expands or grows the Current Region Selection.

:Contract

This menu command contracts or shrinks the Current Region Selection.

:Cleanup

This menu command removes noise from the Current Region Selection

Default Color

This menu accesses the following sub menus that are all default fill options for the canvas. Running the menu commands specify what the new default color option will be and then set the current canvas layer to that default fill option. Only one of these options can be checked at any given time, and the one that is checked means it is the current default color option.

:White

This menu command sets the default color option and the current layer to solid white.

:Black

This menu command sets the default color option and the current layer to solid white.

:Source Color

This menu command sets the default color option and the current layer to the current source color.

:Source Image

This menu command sets the default color option and the current layer to the current source image.

:Selection

This menu command sets the default color option and the current layer to the current selection image.

:Live Video Capture

This menu command sets the default color option and the current layer to a live video frame capture.

:Source Alpha

This menu command sets the default color option and the current layer to the source image's alpha channel.

:Layer Alpha

This menu command sets the default color option and the current layer to the current layer's alpha channel.

:Source Color Mem 1

This menu command sets the default color option and the current layer to the color in the current source color memory #1.

Set to Default Color

This menu command sets the current canvas layer to the existing default color fill option.

Default Interpolation

This menu accesses the following sub menus that are options for the default image interpolation algorithm used throughout Studio Artist whenever an image needs to be resized.

:BiCubic

This menu flag specifies that bicubic interpolation is used as the default interpolation algorithm when checked.

:Supersizer

This menu flag specifies that Supersizer interpolation is used as the default interpolation algorithm when checked.

Erase

This menu command performs a full erase of the current canvas layer. This means the layer is set to the default color, the alpha channel is set to the alpha initialization default, the layer's bezier path frame is erased, and the paint synthesizer blanking buffer is initialized.

...

Canvas to

This menu access the following submenus that copy the current canvas layer image somewhere:

:Source

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

:Clipboard

This menu command allows you to copy the current Canvas into the clipboard. You could then switch to another program that supports an image clipboard and paste the image.

Onion Skin

This menu accesses the following sub menu commands associated with the Canvas Onion Skin:

:Toggle OnionSkin

This menu command allows you to toggle the onion skin layer on (checked) and off (unchecked). The onion skin layer can display either the source image or adjacent movie frames or the last movie stream frame or an arbitrary stored image with a certain percentage of transparency. The onion skin can be used as an aid in drawing still images or animation frames. The specific settings for onion skin content and display transparency are located in the main preferences dialog.

...

:Manual Load

Loads the current canvas into the onion skin buffer.

:Source

Switches the onion skin display mode to show the source image

:Canvas Movie

Switches the onion skin display mode to show adjacent frames in the canvas movie.

:Last Stream

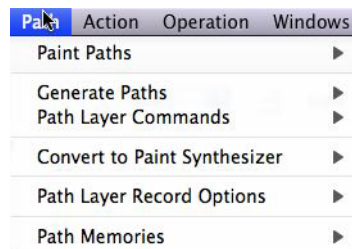
Switches the onion skin display mode to show the last frame written into an open stream.

:Sequential Key Frame

Switches the onion skin display mode to show the last complete keyframe drawn while sequential keyframe recording.

Path

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



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

Paint Paths

This menu accesses the following sub menu commands associated with painting the current path frame:

:Full Layer

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

:Reverse Full Layer

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

:Selected Only

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

Generate Paths

This menu accesses the following sub menu commands associated with generating new paths:

:from Source Edges

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

:from Source Adjacent Edges

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

:from Canvas Edges

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

:from Selection Edges

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

...

:from Source Skeleton

This menu command examines the current source image and generated a series of new paths that represent the internal skeleton of the current source image.

:from Canvas Skeleton

This menu command examines the current canvas image and generated a series of new paths that represent the internal skeleton of the current canvas image.

:from Selection Skeleton

This menu command examines the current selection image and generated a series of

new paths that represent the internal skeleton of the current selection image.

...

:from NonWhite Canvas

This menu command examines the current canvas layer and scan converts all black lines in the canvas to new generated paths. It is best to use this command with a hard contrast BW canvas image that is composed of thin black lines on a white background.

:from NonWhite Selection

This menu command examines the current selection image and scan converts all black lines in the selection to new generated paths. It is best to use this command with a hard contrast BW selection image that is composed of thin black lines on a white background.

...

:Gen Option

This menu accesses sub menu flags that let you specify a default generation option for the generate paths algorithms. Currently you can specify normal behavior or more detailed path generation.

...

:from Ip Op

This menu command generates paths from the current Image Operation. Note that only a few image operations currently support path generation, so this menu item will only be accessible if the current image operation supports path generation (like Sketch Edge for example).

Path Layer Commands

This menu accesses the following sub menu commands associated with manipulating the current path layer:

:Erase

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

--

:Expand

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.

:Expand and Remove

This menu command expands the current path frame paths and then removes the old path frame paths.

:Complete Expand

This menu command expands the current path frame paths in multiple iterations until the complete canvas is covered.

:Connect Closest

This menu command connects the closest sets of neighboring paths.

:Connect Closest and Remove

This menu command connects the closest sets of neighboring paths.. The old path frame paths are then removed from the path frame buffer leaving just the new paths that connected the old removed original paths.

:Connect if Close

This menu command connects sets of neighboring paths if they are close and otherwise

does not connect them.

:Skeletonize

This menu command generates new paths that are located at the center distances between the existing paths using a skeleton distance calculation.

:Skeletonize and Remove

This menu command generates new paths that are located at the center distances between the existing paths using a skeleton distance calculation. The old path frame paths are then removed from the path frame buffer.

:Simplify

This menu command simplifies the path frame by smoothing the individual curves. The resulting effect is a form of stylization, and is useful to convert automatically generated paths into curves that look like they were drawn with a few smooth curves.

:Simplify Lite

This menu command lightly simplifies the path frame by smoothing the individual curves.

:Straighten

This menu command straightens the individual curves in the path frame. The resulting effect is a form of stylization that looks like hand drawn straight lines.

:Straighten Subtle

This menu command subtly straightens the individual curves in the path frame. The resulting effect is a form of stylization that looks like hand drawn straight lines.

...

:Size Prune

This menu command removes small paths from the path frame.

:Size Prune1

This menu command removes larger small paths from the path frame.

:Size Prune2

This menu command removes even larger small paths from the path frame.

Convert to Paint Synthesizer

This menu command accesses the following powerful sub menu commands associated with converting the current path layer or layer bezier keyframes into a single paint action step:

:as Time Particles

This menu command generates a Paint Synthesizer patch that encapsulates the current Bezier path frame as a series of time particle paint strokes that will run as a single paint action step.

:as Autodraw Embedded Bezier Frame

This menu command generates a Paint Synthesizer patch that encapsulates the current Bezier path frame as a series of internal Bezier memory Path Shape paint strokes that will run as a single paint action step..

:as Repeating Pattern

This menu command generates a Paint Synthesizer patch that encapsulates the current Bezier path frame as a repeating path shape pattern.

:Convert PASEq Bezier Context to Embedded Autodraw

This menu command converts all bezier context action steps in the current paint action sequence (PASEq) into autodraw embedded paint action steps.

:Convert PASEq Source Context to Bezier Context

This menu command generates a new Bezier Context action step in the current paint action sequence (PASEq). Before that happens the current paint action sequence is run at each keyframe associated with a Source Context action step. After the PASEq is finished running at that keyframe, the resulting bezier path frame is used as the contents for the new Bezier Context action step at that frame time.

:Convert MSG Scan to Embedded Bez Path Start

This menu command runs the current MSG preset as a MSG path start generator and then generates a Paint Synthesizer patch that encapsulates those MSG generated path start locations as an internal path memory path start generator.

All of these menu commands edit the current Paint Synthesizer parameters to support the Bezier encapsulation. All of these menu commands will also record as a Paint Action Sequence action step if PASEq recording is turned on when the menu command is run. The Paint Synthesizer Action Step to playback the path frame as paint strokes is what is recorded in the PASEq, not the path conversion step.

Path Layer Record Options

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

:Pen Draw

Setting this flag specifies that individual mouse or pen drawn stroke paths will be immediately converted to Bezier paths in the current Path Layer when the stroke is finished being drawn.

:Action Draw

Setting this flag specifies that individual autodrawn stroke paths will be immediately

converted to Bezier paths in the current Path Layer when the stroke is finished being drawn.

:Vectorizer

Setting this flag specifies that individual regions generated with the Vectorizer are recorded into the current path frame.

:Erase Before Action

Setting this flag specifies that the current path frame is erased before an Action starts outputting new region paths.

:Use Recorded Paint Color

Setting this flag specifies that initial recorded paint stroke colors associated with each path will be used when redrawing the individual paths. If the flag is not set, then the current source color will be used when redrawing the paths.

:Split NonContiguous

Setting this flag means that generated paths that are non-contiguous internally (paths with holes in them) are first split into multiple contiguous paths and each of those paths are then converted to Bezier paths. The normal Bezier conversion process would stop the conversion at the first non-contiguous boundary.

Path Memories

This menu allows you to access different menu flag settings associated with global and internal Bezier path memories.

:Internal : Playback

:Internal : Record

These menu commands allow you to playback the contents of the internal paint synthesizer bezier path memory into the current layer's bezier path frame. Or to record

from the current layer's bezier path frame into the internal bezier path memory.

:Global1 : Playback

:Global1 : Record

:Global2 : Playback

:Global2 : Record

:Global3 : Playback

:Global4 : Record

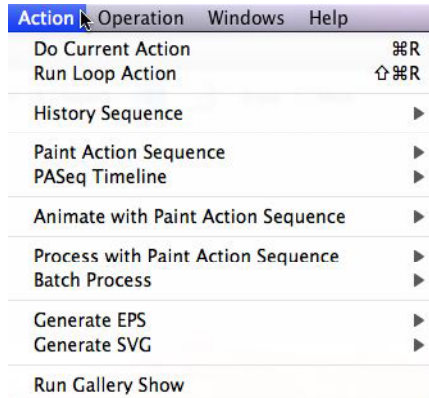
:Global5 : Playback

:Global5 : Record

These menu commands allow you to playback the contents of the global bezier path memories (1,2,3,4) into the current layer's bezier path frame. Or to record from the current layer's bezier path frame into the global bezier path memories.

Action

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



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's Action.

Run Loop Action

This command executes the current Operation's Action as a loop action. A loop action means that as soon as the action is finished it starts over again and repeats indefinitely until the users tops it by pressing the space bar.

History Sequence

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

:Play

This menu command starts playback of the current History Sequence.

:Erase

This menu command erases the entire current History Sequence.

:Record

Setting this flag specifies whether recording is on or off for the current History Sequence.

:Copy Replace to PAsEq

This menu command replaces the contents of the current paint action sequence with the current history sequence.

:Copy Replace to PAsEq

This menu command appends the current history sequence at the end of the current paint action sequence.

Paint Action Sequence

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

:Play

This menu command starts playback of the current Paint Action Sequence.

:Loop Play Paint Action Sequence

This menu command starts loop playback of the current Paint Action Sequence. When the end of the PAsEq is reached, it will loop and begin playing again from the beginning.

:Activate Paint Action Sequence Recording

Setting this flag specifies whether recording is on or off for the current Paint Action Sequence.

:Record Last Action as Paint Action Step

Running this menu command records your last executed Studio Artist Action as an Action Step in the PASEq. PASEq recording does not have to be activated for this command to record the step.

This command is useful if you did something using one of the Studio Artist Actions, like the result and want to save it, but did not have PASEq or History recording turned on when you did the Action. By running this command you can still record what you did after the fact, including any internal randomization parameters so you can play it back later.

:Erase

This menu command erases the entire current Paint Action Sequence.

PASEq Timeline

This menu allows you to access the following commands associated with the current Paint Action Sequence timeline.

:Time Compress/Expand...

This menu command brings up a dialog that lets you specify a timing adjustment ratio. The paint action sequence timeline is then time compressed or expanded appropriately.

:Delete Keyframes

This menu command deletes all existing paint action sequence keyframes except for those recorded at frame 1.

...

:Embedded Bezier Frame :Reorder Minimal Distance

This menu command reorders all of the individual path indexes in the embedded bezier frames stored in paint action steps using a minimal distance metric between keyframes. What this does is reorders the individual paths so that they move the shortest distance when keyframe animating. Reordering the paths using this algorithm generates smoother keyframe animation when keyframe animating sketch animation.

:Embedded Bezier Frame :Normalize Recycle

This menu command normalizes the path index maximum count across all embedded bezier frames stored in paint action steps so that all keyframes in a particular PASEq step have the same number of paths. Existing paths in a keyframe are duplicated as necessary to normalize the path count.

:Embedded Bezier Frame :Normalize Split

This menu command normalizes the path index maximum count across all embedded bezier frames stored in paint action steps so that all keyframes in a particular PASEq step have the same number of paths. Existing paths in a keyframe are split in half as necessary to normalize the path count.

...

:Record Context :Source

This menu command records a source context action step to the current paint action sequence. The current source image is used for the source reference recorded at frame 1 in the generated source context action step.

:Record Context :Bezier

This menu command records a bezier context action step to the current paint action sequence. The current layer's bezier path frame is used for the bezier reference recorded at frame 1 in the generated bezier context action step.

:Record Context :Content

This menu command records a content context action step to the current paint action sequence. The current source image is used for the content reference recorded at frame 1 in the generated content context action step.

:Record Context :Bezier+Content

This menu command records a bezier+content context action step to the current paint action sequence. The current source image is used for the content reference recorded at frame 1 in the generated bezier+content context action step. The current layer's bezier path frame is used for the bezier reference recorded at frame 1 in the generated bezier+content context action step.

:Record Context :Morph

This menu command records a morph context action step to the current paint action sequence. The current source image is used for the image reference recorded at frame 1 in the generated morph context action step. The current layer's bezier path frame is used for the bezier reference recorded at frame 1 in the generated morph context action step.

:Record Context :Warp

This menu command records a warp context action step to the current paint action sequence. The current source image is used for the image reference recorded at frame 1 in the generated warp context action step. The current layer's bezier path frame is used for the bezier reference recorded at frame 1 in the generated warp context action step.

:Record Context :Filter

This menu command records a warp context action step to the current paint action sequence. The filter source image is used for the image reference recorded at frame 1 in the generated filter context action step. The current layer's bezier path frame is used for the bezier reference recorded at frame 1 in the generated filter context action step.

:Record Context :Inv Warp

This menu command records an inverse warp context action step to the current paint action sequence. The current source image is used for the image reference recorded at frame 1 in the generated inverse warp context action step. The current layer's bezier path frame is used for the bezier reference recorded at frame 1 in the generated inverse warp context action step.

:Record Context :Multiple Keys :Source...

:Record Context :Multiple Keys :Content...

:Record Context :Multiple Keys :Morph...

These menu commands allows you to record a new source, content or morph context with multiple keyframes. Running the menu command brings up a standard file dialog. You can select a source image and then press Ok to add it as a new keyframe. As long as you continue to press Ok you can select new source images that will be added as new adjacent keyframes. When you are finished selecting source keyframes press the cancel button.

Process Movie With Paint Action Sequence

This command processes a source QuickTime movie located on your hard disk with the current Paint Action Sequence frame by frame. The following sub menus specify the output format for the processed QuickTime movie:

:Movie to Movie...

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 its 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.

:Movie to Image...

This command processes a source QuickTime movie located on your hard disk with the current Paint Action Sequence frame by frame, generating a series of output image files for each processed frame. The size or resolution of the processed output images 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 image size. The size of the output image 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 image file and specify its location on your hard disk. When you click OK, the movie processing will begin. Each processed image file will be sequentially numbered using your specified output file name as a root string.

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 image files. This is a useful way to preview your processing sequence in the Canvas prior to final execution into output image files on your hard disk.

:Movie to EPS...

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

Individual Paint Action steps that currently support EPS output include anything that uses the Paint Synthesizer, Region Selection Fills, or the Vectorizer.

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 EPS frame size. The size of the output EPS frame 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 EPS file and specify its location on your hard disk. When you click OK, the movie processing will begin. Each processed EPS file will be sequentially numbered using your specified output file name as a root string.

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 image files. This is a useful way to preview your processing sequence in the Canvas prior to final execution into output image files on your hard disk.

:Image to Movie...

:Image to Image...

:Image to EPS...

These commands process a folder of image files located on your hard disk with the current Paint Action Sequence image by image. The sub menu destinations have the same functionality as the ones detailed in the previous section on Processing a Movie With a PASEq. The only difference is that a folder of frame images is used as the source of the individual frames for the movie processing.

These commands are also useful for batch processing groups of different images or a cd-rom of stock photos with a PASEq aesthetic effect.

Batch Process

This menu access the following sub menus that allow for PASEq batch processing options:

:with Paint Action Sequence...

This command allows the user to process a folder of images and/or movie files with the current paint action sequence into a 2nd output folder for the PASEq rendered images or movie files.

:with Folder of Paint Action Sequences...

This command allows the user to choose a folder of Paint Action Sequences and process a second folder of images and/or movie files with each PASEq in the PASEq folder into a 3rd output folder for the PASEq rendered images or movie files.

...

Generate EPS

This menu accesses sub menus that generate vector EPS output files from a Studio Artist Action. The following sub menus specify the particular action used to generate the EPS file:

:with Vectorizer...

This command runs the Vectorizer Action and outputs the generated Bezier Regions to an EPS file as well as to the current canvas.

:with Paint Action Sequence...

This command runs the PASEq Action and outputs the generated Bezier information from steps in the PASEq to an EPS file as well as to the current canvas.

Individual Paint Action steps that currently support EPS output include anything that uses the Paint Synthesizer, solid color Default Color Fills, or the Vectorizer.

You should be aware that postscript EPS files do not support the wide range of organic paint and textural effects that can be generated using Studio Artist's Paint Synthesizer and Image Processing functionality. Studio Artist EPS output will have a flat color look to the individual regions or regionized paint strokes.

You should edit your paint patches accordingly so what you see displayed on the screen in raster paint matches what you will get in the eps output. Paint Synthesizer macro edits are provided to allow you to make these editing changes to any presets quickly.

Generate SVG

This menu accesses sub menus that generate vector SVG output files from a Studio Artist Action. The following sub menus specify the particular action used to generate the SVG file:

:with Vectorizer...

This command runs the Vectorizer Action and outputs the generated Bezier Regions to an SVG file as well as to the current canvas.

:with Paint Action Sequence...

This command runs the PASEq Action and outputs the generated Bezier information from steps in the PASEq to an SVG file as well as to the current canvas.

:Print with Paint Action Sequence...

This command allows you to print directly from the generated SVG vectors. The normal File :Print functionality prints from the raster frame buffer associate with the Studio Artist layers and view. Printing directly with the generated SVG vectors using this can generate better quality high resolution prints. The mac standard print dialog also allows for the creation of PDF files (bottom left), so this is a way to create a vector PDF file from the generated SVG vectors.

Be aware that only Studio Artist actions that use vector drawing can generate SVG vector. This includes the vectorizer, paint synthesizer presets that use the Anti-Alias Solid Brush Type or the Vector main Render Technique, and solid color default color fills.

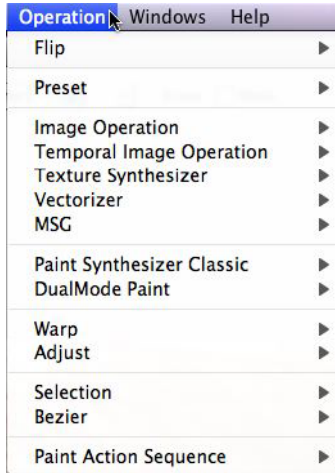
...

Run Gallery Show

This menu command starts the gallery show feature. Gallery show will continue to run until you press the spacebar to stop it. There are gallery show preferences that you can set that determine what gallery show will do when running.

Operation

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



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 hierarchical parameter panes via their popup controls.

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

Flip

This sub menu associated with this menu provides convenient quick navigation back and forth between different Studio Artist floating palette windows as well as certain main Operation modes used commonly in typical work such as Bezier Editing or Region Selection. All Go To menus are associated with cmdnd keys for quick cmdnd key navigation while working.

--

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 Operation

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.

Temporal Image Operation

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.

Texture Synthesizer

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

Vectorizer

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

MSG

This menu provides quick navigation access to the individual parameter pane associated with the MSG Operation mode User Adjustments.

...

Paint Synthesizer Classic

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.

DualMode Paint

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

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.

Adjust

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

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.

Bezier

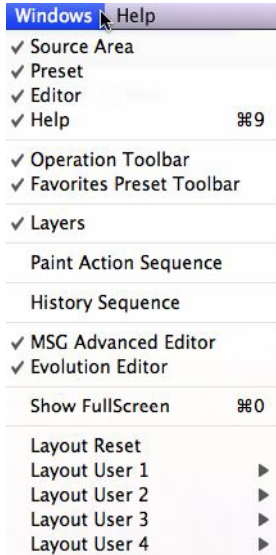
This menu provides quick navigation access to the Bezier Draw and Edit control panes and Operation mode.

Paint Action Sequence

This menu provides quick navigation access to the Paint Action Sequence control panes and Operation mode.

Windows

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



The Windows menu commands provide access the different Studio Artist palettes and tool bars. You can also toggle full screen view on or off, and access the user layout memories which can be used to save and restore different workspace configurations.

Chapter 16: Technical Questions

Studio Artist is a powerful creative tool with an extreme amount of user configurability. 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 Technical Support, you should check this chapter to see if the answer to your question is here. Also, you can use the Studio Artist User Forum available via studioartist.ning.com to ask questions and get answers from expert users as well as Synthetik.

If you do need to contact Technical Support, please include as much information as possible to help us diagnose and fix your problem. Keep in mind the troubleshooting mantras listed below.

Troubleshooting Your Problem

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

Is the problem repeatable?

Trace your signal flow.

If you get an error message, write it down and include it in your email.

If you are running OSX and you crash, please include the crash report in your emails to us. The information in the crash report helps us diagnose and correct any problems you

may run into.

Things to Keep in Mind

The following are a few tips to keep in mind when you use Studio Artist.

Large Source Images

Studio Artist is unique from other graphics programs in that it has the concept of a source and canvas image. The Source and Canvas dimensions or resolutions can be different. The source was originally conceived to be used like an artist uses a model, as a source of visual abstraction. Studio Artist does not modify the source image in any way. However, it does currently load the complete source image into ram. Working with large source images will reduce the amount of memory available for the Canvas and its associated working buffers.

For many applications (especially those involving painting), a low resolution source image may be more than adequate. Studio Artist's paint algorithms will be generating detail at the complete Canvas resolution even when working with a low resolution source image. This is a different metaphor than other image processing programs where you would typically choose a source image scanned at print resolution.

If you have high resolution source images, consider generating low resolution versions of them for use as source images when painting in Studio Artist. This will free up more ram space for your higher resolution working paint canvas and make your overall paint session more responsive.

Studio Artist versions prior to version 3 had a hard limitation of 4000 x 4000 pixels for it's Canvas size. This limitation was removed starting with Studio Artist version 3. The only Canvas size restriction is the amount of virtual memory swap space on disk that the Macintosh Operating System supports and the amount of free physical disk space you actually have available for virtual memory to use.

OS-X versions prior to 10.3 had a limit of 2 gig virtual memory swap space per process.

This has currently been expanded to 8 gig under Panther. This is an operating system virtual memory limitation as opposed to a limitation existing within Studio Artist.

Image Open and Save Operations

Studio Artist primarily uses Apple's Quicktime image import and export components to read and write image files to and from disk. If the Quicktime image import/export components are missing or damaged in any way, this can affect the ability of the program to read and write image files.

Movie Frame Writing to a Disk File

Studio Artist uses Apple's Quicktime internal api's for writing individual movie frames to a movie file. We support all of the available image compression codecs you have installed on your computer.

Some compression codecs (Avid codec for example) will only work with specific frame pixel dimensions. If you run into problems associated with the use of a particular compression codec, try switching to another and see if you can pinpoint if the problem is associated with a particular codec.

Another thing to be aware of is that when you upgrade your operating system or Quicktime version, your existing Studio Artist movie compression preferences may become invalid. This could cause problems when you try to write a movie frame when processing a movie file within Studio Artist, or when writing to an open Movie Stream.

If you run into a crash problem when writing a movie frame, try opening your movie compression preferences, located in the 'File : Movie Codec Settings' dialog. Change all of the settings in the movie compression preferences dialog. Even if you change them and then change them back to their old settings. Then quit Studio Artist and then restart Studio Artist. This should fix the problem for you.

Common Problems

The application launches but never starts up properly.

You may have trashed your preference or settings files. If the preference or settings files are damaged, the program may have trouble starting as it will try to read the damaged file and may respond inappropriately.

Under OS-X:

OS-X supports the concept of multiple users on the same machine. Individual user preferences are located in a particular user's personal folder. Go to the Users folder. In there should be a folder with your specific user name. In that folder should be a folder called Library. In there should be a folder called Preferences.

To fix a problem with damaged preference files, go to the System Folder Preferences folder and remove the file named com.synthetik.StudioArtist4.

The application takes forever to launch and there are no presets.

The Studio Artist application needs to be in the same Studio Artist folder as the Preset and Brush folders. If these special preset folders are not physically next to application file in the same folder, the application will be unable to find its associated factory presets and brush files.

A common error is that someone makes an application alias and then drags the actual application file to their desktop rather than the alias. Always keep the physical Studio Artist application in the Studio Artist folder next to the preset folder.

I keep getting assert error messages when running the program.

You are probably running out of working memory. A specific symptom for this particular problem is an error message that includes the description “(data != nil)”.

Studio Artist OSX uses virtual memory in addition to physical ram. Virtual memory expands the amount of physical memory an application can work with beyond what is available in RAM by swapping blocks of memory back and forth from your hard disk to RAM.

If you are running Studio Artist OSX and you get error messages associated with running out of memory it means you are running out of either physical swap space for virtual memory on your hard disk or you have exceeded the OS limitations for virtual memory swap space. Prior to OSX 10.3 this was a 2 gig virtual memory limitation. Starting with the OSX10.4 release this limitation was increased to 4 gig.

Reducing the source image and canvas size will reduce the amount of memory Studio Artist uses. You also have the option of working with a smaller Source image while keeping the Canvas size the same if you are using a large source image. Typically, you can use a small source image when painting into a much larger canvas size Studio Artist will analyze the small source image and generate paint detail at the higher resolution canvas dimensions.

I installed a new Wacom tablet driver and now the application doesn't launch.

Did you de-install the old Wacom driver or manually remove the old Wacom Control Panel, Extensions, and Preferences. We have found incompatibilities between Wacom preference files and different tablets or tablet drivers. Removing the old Wacom preference files fixes the problem.

You can always go to the Wacom web site www.wacom.com to download the most recent versions of the Wacom tablet driver software.

The program doesn't seem to be drawing.

The key to a problem of this nature is to logically work through your current Studio Artist interface settings and current Paint Patch parameter settings to determine why drawing isn't taking place. Or perhaps drawing is taking place but you just aren't seeing it.

For example, you may have Layer Alpha view On, but have Paint Synth Alpha Enable turned off. If this was the case, your paint strokes would not be drawing into the layer alpha channel, so you would not see the rgb channels draw when alpha view was turned on.

Another potential problem could be specifying 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 (i.e.. the white part).

Check the Paint Fill Setup 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. For example, if the canvas is all black and you have the Path Start control panel configured to only start paths in white areas, you will never get a new path when autodrawing.

If you run into situations where drawing does not seem to be occurring, here are a series of steps you can try to debug what is going on.

First, are you in an Operation mode that supports drawing? For example, Paint Synthesizer does support drawing, but Image Processing does not.

Second, try working with the Layer window composite settings to see if you have something set up there that is blocking you from seeing the layer drawing if in View All mode. Third, try a different preset to see if the problem is internal to the editable parameters in a particular preset. If that is the case, you can then try to work through the various control panels to debug the problem.

I reset the background but nothing changed?

I reset the background to white but i still see a black canvas?

Check to make sure you don't have alpha view enabled. If you do, then the canvas background will be the default background color you have specified in the Layer Preferences dialog until you paint with alpha drawing enabled or you manually reset the alpha channel with one of the 'Canvas : Alpha : Set to' to menu commands.

You can always set the alpha view popup to off in the layers window to see what is really in the layer without it being masked by the layer's alpha channel.

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**' 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. Then when the application does fully launch, there will not be any preset icons to choose from.

Always keep the Studio Artist application in the Studio Artist folder next to the factory Preset folders!

While you can run Studio Artist directly off of the cd-rom, it will run much slower if you do so. You should follow the install procedure and drag the Studio Artist folder with all of its contents to your hard disk and run the application from there.

Why can't I open an image file?

Studio Artist looks for the image file type id. If that is not set, then it looks at the extension of the file. For example, a jpeg file without a jpeg file type needs to be named myImage.jpg or myImage.jpeg in order for Studio Artist to know it is a jpeg file.

Many digital camera acquisition programs under OS-X do not properly write out the Macintosh file type id. If this is the case, then you need to make sure you provide the proper file extension to the image names, or they will come up grayed out in the Open find file dialog.

File type ids are not supported on windows, so using proper file extensions are essential when working on windows.

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

History Sequence recording may be turned on and you are unaware of this. The history sequence does not spool to disk with this version. This means that your history sequence 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.

Another potential memory issue to be aware of are the Path :Path Layer Record Option menu flags. If you have the Path Layer Record Option Pen Draw, Action Draw, or Vectorizer menu flags set, then each time you perform the associated action the internal paths generated by the action are converted to Bezier paths and added to the existing layer's Bezier path frame.

The existing contents of the Bezier path frame will not be erased unless the Erase Before Action menu flag is turned on. Be aware that if this menu flag is not set then every time you perform the associated action you are adding more and more Bezier paths to the Bezier path frame, and this will use up more and more memory.

I'm processing a movie file with a Paint Action Sequence and the output movie file is all white?

How do I get the individual movie frames to appear in the Canvas when processing a movie file?

Some of the factory paint action sequences were designed to process the existing Canvas with a series of visual effects. These effects may not change the visual appearance of a white canvas.

Studio Artist uses the Action step script stored in a Paint Action Sequence very literally. In order to load the current movie frame into the Canvas when the script is run, there