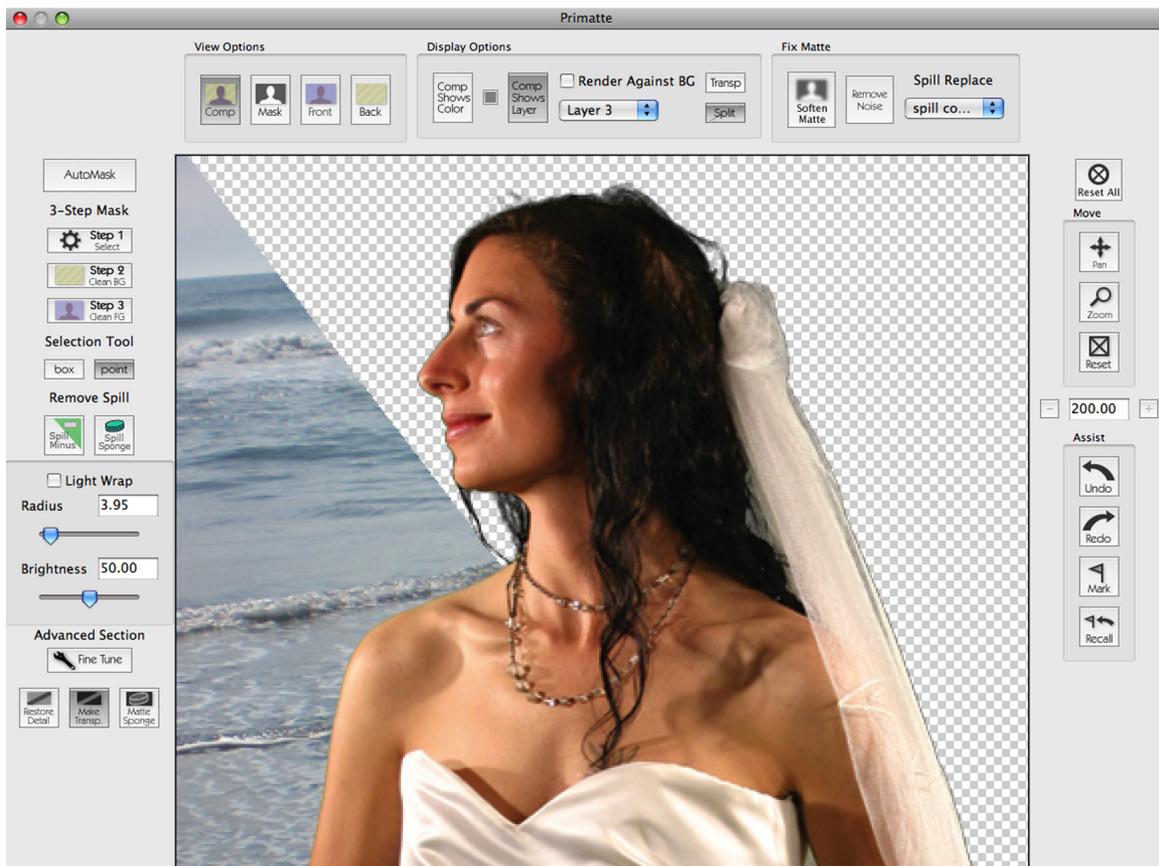


Make complex masks in minutes.

## Primatte Chromakey 3.5



A fast, powerful plugin for Photoshop  
and Photoshop Elements.



Digital Anarchy  
Smart Tools for Creative Minds.  
[www.digitalanarchy.com](http://www.digitalanarchy.com)

algorithm by  
**Photron**

<b>Introduction to Primatte</b>	<b>6</b>
How does Primatte work?	6
Compatible host apps & OS's	6
Terms in this manual	6
Working in Photoshop	7
Primatte for other applications	7
What's new in Primatte 3.5	8
64-bit compatible!	8
Streamlined new interface	8
Windows processor with SSE2	8
Primatte with Backdrop Designer	9
<b>What Primatte does &amp; doesn't do.</b>	<b>10</b>
Not a general masking tool.	10
Doesn't create new backgrounds.	10
May not fix lighting issues.	11
May not fix shadow issues.	11
May not fix wrinkle issues.	11
<b>Overview of Primatte interface</b>	<b>12</b>
<b>Preview &amp; View Options</b>	<b>13</b>
Preview Window	13
View Option modes	14
Comp View	15
Mask View	15
Front View	16
Back View	16
Toggle your Views	16
<b>Display Options</b>	<b>17</b>
Comp Shows Color button	17
Comp Shows Layer button	18
Comp Shows Layer popup	19
Render Against BG checkbox	20
Transp, Split buttons	21
Which Preview/Display should I use?	22
<b>Move Tools</b>	<b>23</b>
Pan	23
Zoom	23

Zoom Reset	23
Zoom Plus, Minus, Numeric	23
<b>Assist Tools</b>	<b>24</b>
Reset All	24
Undo, Redo	24
Mark, Recall	24
Save settings between sessions	24
OK button	25
Cancel button	25
<b>AutoMask tool</b>	<b>26</b>
Using AutoMask	26
Always On checkbox	26
Radius slider	27
Use for batching photos	27
Best for head, shoulder, 3/4 shots	28
How to shoot for AutoMask	28
<b>3-Step Mask Tools</b>	<b>29</b>
Step 1: Select tool	29
Step 2: Clean BG tool	30
Step 3: Clean FG tool	31
Use 3-Way to clean up AutoMask	32
<b>Selection Tools</b>	<b>33</b>
Point Selection tool	33
Box Selection tool	33
Try, then try again	33
<b>Use Actions &amp; Batching</b>	<b>34</b>
Overview of workflow	34
Always On checkbox	35
About Actions	35
About Batch processes	35
Training for Actions	36
How it works (Actions)	36
How it works (Batches)	37

<b>Using Garbage Mattes</b>	<b>39</b>
What is a garbage matte?	39
How to create a garbage matte	40
<b>About Spill Correction</b>	<b>42</b>
What is 'color spill'?	42
How Spill Correction tools work	43
Be careful not to overcorrect	43
<b>Remove Spill tools</b>	<b>44</b>
Spill Minus tool	44
Spill Sponge tool	44
Example of Spill Sponge	46
<b>Light Wrap</b>	<b>47</b>
How it Works	47
Radius slider	47
Brightness slider	48
<b>Advanced Detail Tools</b>	<b>49</b>
Make Transparent tool	49
Restore Detail tool	49
Matte Sponge tool	50
<b>Fine Tune Tool</b>	<b>51</b>
How Fine Tune works	51
Remove Spill slider	52
Transparency slider	52
Restore Detail slider	53
Color Chip	53
Example of Fine Tune correction	54
Example of Fine Tune over-correction	55
<b>Fix Matte Tools</b>	<b>56</b>
Soften Matte tool	56
Soften Matte slider	56
Shrink Matte slider	56
In Only checkbox	56

<b>Remove Noise tool</b>	<b>58</b>
When to use it	58
How to use it	58
Tolerance slider	58
Off, Small, Medium, Large buttons	59
<b>Spill Replace popup</b>	<b>60</b>
Spill Complement	60
Spill Solid	60
Spill Defocus Background	60
Example of Spill Replace options	61
<b>Overview of chromakey</b>	<b>62</b>
How it works	62
So many terms!	62
What is a mask?	62
Foreground & Background	63
Behind the scenes	63
Choosing a screen color	64
Lighting and staging	65
<b>The Primatte algorithm</b>	<b>67</b>
It's all about polyhedrons	67
Four regions of color	67
How does this relate to me?	69

### Introduction to Primatte

Primatte brings the power of film and TV special effects directly to you, the photographer or graphic designer. Primatte is a powerful plugin for Adobe Photoshop and Elements. It has one main function: to remove solid colored backgrounds from an image and place the resulting foreground image into a different background.

### How does Primatte work?

Primatte creates its masks by removing the pixels of the designated color, and replacing that color with transparent pixels. Effectively, you are creating a very complex soft-edged mask.

Primatte is commonly used in motion picture and television post-production for the creation of special effects. Increasingly, chromakeying has become indispensable in graphic design and still photography. In fact, in the three years that our Primatte has been on the market, we have seen a significant shift in the industry's relationship to chromakey and other high-end compositing solutions. Don't be the last on your block!

### Compatible host apps & OS's

Primatte 3.5 works with the following host applications:

- Mac 10.4, 10.5 and 10.6.
- Windows XP Home, Windows XP Pro, Vista 32-bit, Vista 64-bit, Windows 7.

Primatte 3.5 is compatible with these host applications:

- Adobe Photoshop, versions 7.0, CS, CS2, CS3, CS4 and CS5.
- Photoshop Elements, version 6.0-9.0.

Primatte is not currently compatible with other drawing applications, like the Corel suite. This is because Primatte makes use of transparency and other host apps handle transparency differently than Photoshop. Primatte may load and run in another host app but you will not get the necessary end result, which is your subject isolated on a see through background.

### Terms in this manual

Throughout this documentation, we will refer to the color background in the example being worked on. If we're working with a subject shot against a blue background, all of our language will refer to blue. Similarly, if we've used a green screen, we'll refer to green when talking about color removal and color spill.

Keep in mind that Primatte can be used to mask out ANY color, like red or yellow or hot pink (our personal favorite) so if your photographic subject is different than ours, just mentally substitute that color. Of course, the backing screen color should be chosen to complement the colors in the foreground object. A red apple will need a green screen. A green apple might use a red screen.

To simplify our instructions, we will often generically refer to blue. 'Bluespill' is the standard term for unwanted color that seeps into an image, and 'bluescreen' is the standard reference to the solid color that your subject has been photographed against.

### Working in Photoshop

In our examples, we often refer to the workflow and tools in Photoshop. While Primatte and Photoshop are separate pieces of software, they are intertwined. You must have some knowledge of Photoshop in order to make use of Primatte's results.

If any of the functions or concepts mentioned in this section are unfamiliar, we recommend that you read portions of the Photoshop manual. They are all beginner or intermediate ways of working in Photoshop that are easy to understand once explained, and can be helpful to your daily work.

### Primatte for other applications

The process of chromakey is present in many visual disciplines: photography, special effects, video production, and 2D compositing. Therefore, Primatte is available for most applications in each of these disciplines.

Digital Anarchy only develops and sells the Photoshop version of Primatte. If you are interested in Primatte for any software other than Photoshop or a Photoshop-compatible application, please go to the Photron website at [www.photron.com](http://www.photron.com) for more details.

### Proprietary notices

Primatte was developed by IMAGICA Corp., Tokyo, Japan  
Primatte was authored by Yasushi Mishima of Imagica Corp., Tokyo, Japan  
Primatte is a trademark of IMAGICA Corp., Tokyo, Japan  
Primatte is sold and distributed by Photron USA, Inc.

## What's new in Primatte 3.5

Welcome to Primatte 3.5. This version is a pretty big upgrade for the product. We've tweaked a whole bunch of things under the hood, added several features (some big, some small), and done a significant redesign of the user interface.

### 64-bit compatible!

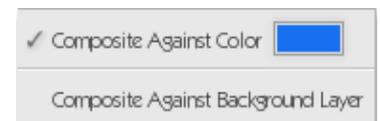
The big news is our long-awaited support of 64-bit systems. Hooray! We've also improved the way Primatte interacts with Photoshop by adding background rendering.

### Streamlined new interface

Primatte 3.0 users will notice that some tools are missing and others have been reorganized. We removed tools that we felt weren't being used very often, in order to make the interface less cluttered, and changed the way others are interacted with. We feel that version 3.5 will speed up everyone's workflow.

Tools removed:

- Composite Against Background Layer. This is replaced and improved by Comp Shows Layer button and popup.
- Composite Against Color. This is replaced by Comp Shows Color button.
- Spill Tools section: Spill Plus, Matte Plus, Matte Minus, Detail Plus, Detail Minus.



Tools added:

- Render Against BG checkbox is new.
- Fix Matte section: Remove Noise is new.
- New option in Spill Replace popup



Tools changed:

- No more navigation bar along the top of interface. Apply and Cancel icons have been replaced with Apply and Cancel buttons.
- Spill Replace popup> Complement Color Spill Replace mode = Spill Compliment.
- Spill Replace popup> Solid Color Spill Replace mode = Spill Solid.



### Windows processor with SSE2

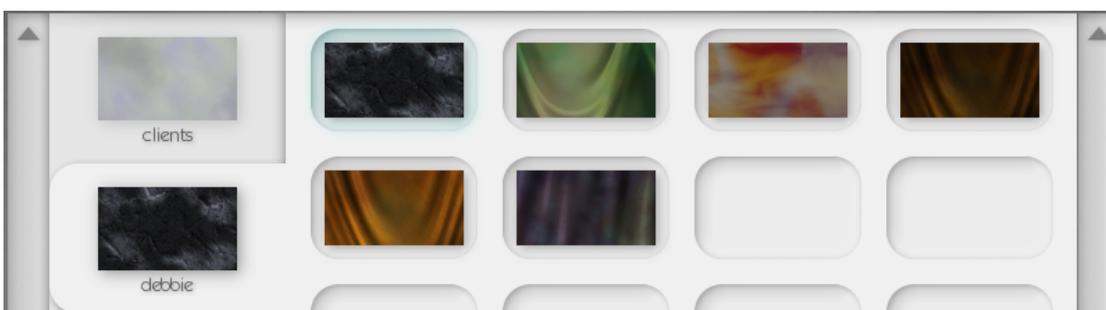
On Windows, Primatte 3.5 requires a processor that supports SSE2 instructions. This means your Intel processor must be a Pentium 4 or later (released in late 2001) or an AMD processor that is Athlon 64 or later (released in late 2003; not the original 32-bit Athlon). Primatte 3.5 won't install if your processor isn't supported. If you do not have a supported processor, you should stick to Primatte 3.0.

**NOTE:** This info does not apply to Mac processors. Intel Macs have always had this SSE2 function, and the info is not relevant for PPC Macs.

## Primatte with Backdrop Designer

Some of the background textural images in this manual were all created with another Digital Anarchy plugin, Backdrop Designer. This Photoshop plugin creates beautiful resolution-independent backdrops, very similar to those expensive physical muslin drapes you may currently have in your photography studio. Customize the presets with a variety of simple tools. Then save your new pattern (if desired) and apply the digital backdrop to your photograph. It's as simple as it sounds!

Check out Backdrop Designer for Photoshop at [www.digitalanarchy.com](http://www.digitalanarchy.com) and download the free demo for Windows, Vista or Mac.



### What Primatte does & doesn't do.

Who needs Primatte for masking? Generally a professional, semi-pro or aspiring photographer who needs to create a sophisticated product with a short production time.

If you are a photographer, you consistently have to isolate difficult imagery like wispy blonde hair. Often you are dealing with color reflection from studio lights. You need to quickly process large groups of photos, and on a regular basis. Perhaps you simply want to be in your photography studio more and in front of a computer less.

Primatte can help you. We have highlighted three questions that are often asked. This information will help you decide if Primatte is the tool you need. If you are still unclear about what Primatte does (or, doesn't) do, feel free to contact us.

1. Not a general masking tool.
2. Doesn't create new backgrounds (but it deletes them!).
3. May not fix lighting, shadow or wrinkle issues.

### Not a general masking tool.

Primatte is not a general masking plugin. There are many third-party tools that are sold for non-specific masking situations. Typically, these plugins concentrate on finding the edges around your subject to delete the background image.

In contrast, Primatte examines a photograph's color space. This allows Primatte to expertly define a narrow range of tones to extract. It's the best way to mask around fine details that are otherwise difficult, like wispy hair and sheer fabric. When you use Primatte, your subject must always be against a single color background.

### Doesn't create new backgrounds.

Primatte is great for situations in which you want to substitute one background for another. It does NOT, however, create those new backgrounds. Instead, Primatte is the tool that deletes the current background you want to get rid of.

There are many software packages that will create new digital backgrounds for you. One great tool is our Photoshop plugin Backdrop Designer. This tool ships with beautiful resolution-independent textures that look like muslin drapes and are customizable. Otherwise, arm yourself with a camera, a scanner or a few stock photography CD's to create your own custom backgrounds.



This is not a chromakey image.



This is a chromakey image.

### May not fix lighting issues.

Like all areas of photography, chromakey work needs good lighting and good props. If the photograph is too dark or bright, if your subject is not well-lit or the lighting is uneven, then Primatte will have difficulty creating a mask.

The background color is too uneven, for instance, for Primatte to distinguish its bright spots from the light colors in your subject (like teeth and eyes). Alternately, your subject is not clearly defined from the background if there are uneven shadows falling along the screen and the model.

Primatte WILL create a mask, but that mask may be less than perfect. You will most likely need to do a little manual work (like garbage mattes and Photoshop retouching) before or after the keying process.

The photo at right was poorly lit and is too dark overall. The photo also has two bright hot spots. Primatte does not have good digital material to work with. The plugin will compensate, but probably not perfectly.



### May not fix shadow issues.

After your photoshoot, you may notice a deep shadow cast along the backing screen. This shadow generally happens from the subject being placed too close to the chromakey screen.

Problem is, Primatte can't tell the difference between those dark shadow colors and the dark colors in your subject (like folds of clothing). Ideally, your subject should be positioned at least 4–6 feet away from the screen and preferably up to 10 feet. If your subject is sitting only 1–2 feet away from the green screen then unwanted shadows will occur.



### May not fix wrinkle issues.

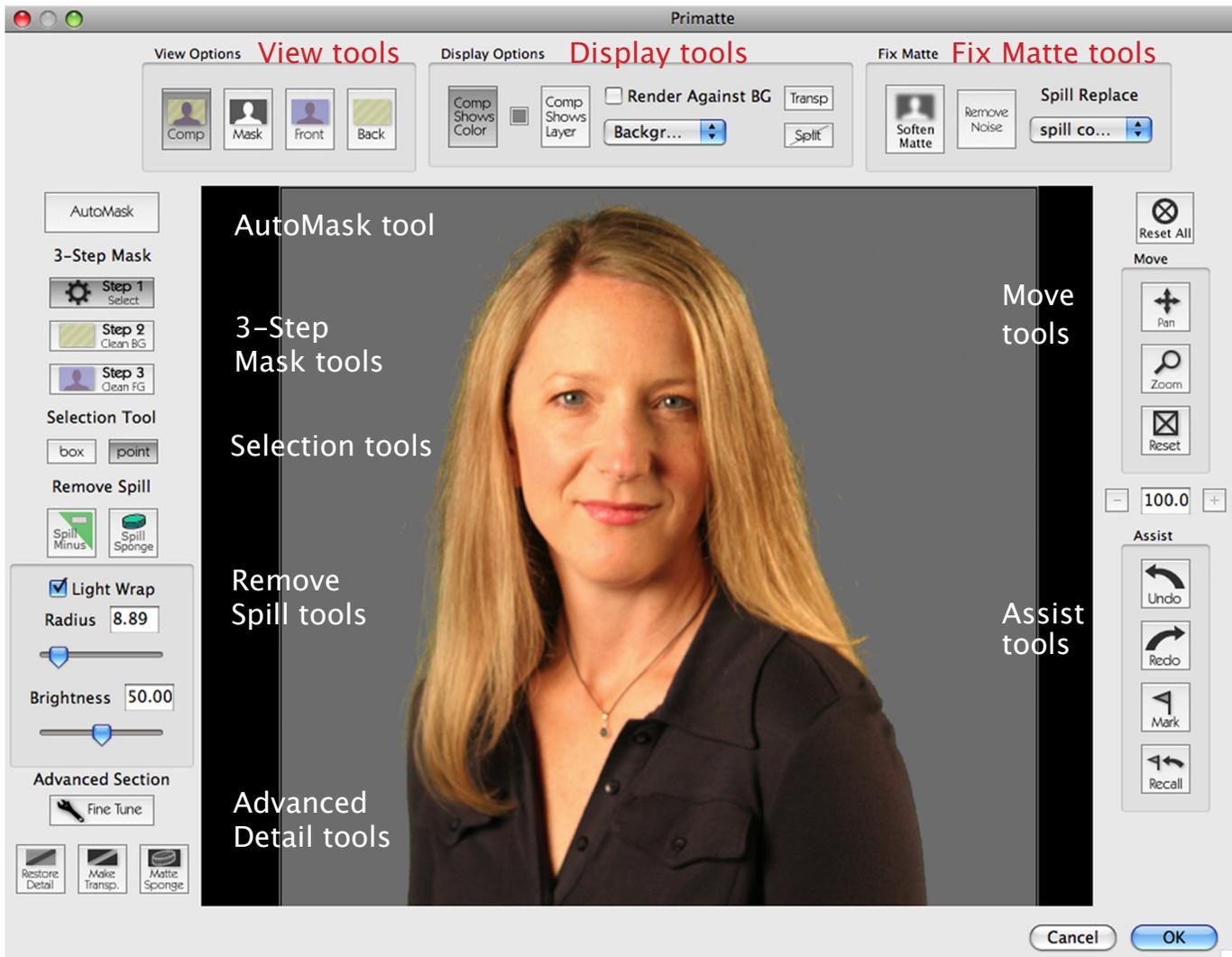
It is also possible that the backing screen you used was not ideal. For instance, the screen may have an uneven tone or deep wrinkles. This causes Primatte some difficulty in defining the range of color that it needs to remove.

In this closeup at right, the green screen shows a texture that's quite varied in tone. Unfortunately, this uneven tone hides the target color from Primatte.



## Overview of Primatte interface

There eight sections of tools in Primatte. There are often two or three ways of achieving similar results or approaching a problem. One method is simply more aggressive or more subtle than the other choices.



- Masking tools. Create a mask with one-click AutoMask or 3-Step Mask tools. [Read more.](#)
- Selection tools. Determine how 3-Step tools sample color. [Read more.](#)
- Remove Spill tools. Correct color spill with Spill Sponge, Spill Minus or Light Wrap. [Read more.](#)
- Advanced Detail tools. Fine tune the color spill and mask edges. [Read more.](#)
- View Options. Preview the mask as a composite or grayscale image. [Read more.](#)
- Display Options. Preview the mask against a solid, transparency or Photoshop layer. [Read more.](#)
- Move tools. Pan, zoom or reset the mask. [Read more.](#)
- Assist tools. Undo, redo, or temporarily save mask settings. [Read more.](#)

## Preview & View Options

There are multiple ways to look at your mask. Being able to view the mask as a composite or as a grayscale representation is crucial to a successful clean mask. It's also helpful to toggle your Foreground image between keyed and original, for a comparison of what details are retained.

### Preview Window

The Preview Window is the viewing area of your file. It's where you look at your photograph as you create its mask.

You may see a white or black area around your photograph in the Preview Window. This is a blank space in the preview that has nothing to do with your graphic or mask.

You may also see a checkerboard preview, depending upon how Primatte's [Display Options](#) are set. This is Photoshop visually expressing an area that is transparent. Primatte simply reflects that function.

Changing the viewable area does not create a new zoom level to the image, or enlarge the physical file it relates to.

**Primatte 3.0 Note:** The Preview Window was resizable with corner grab boxes in Primatte 3.0. This function has been removed.



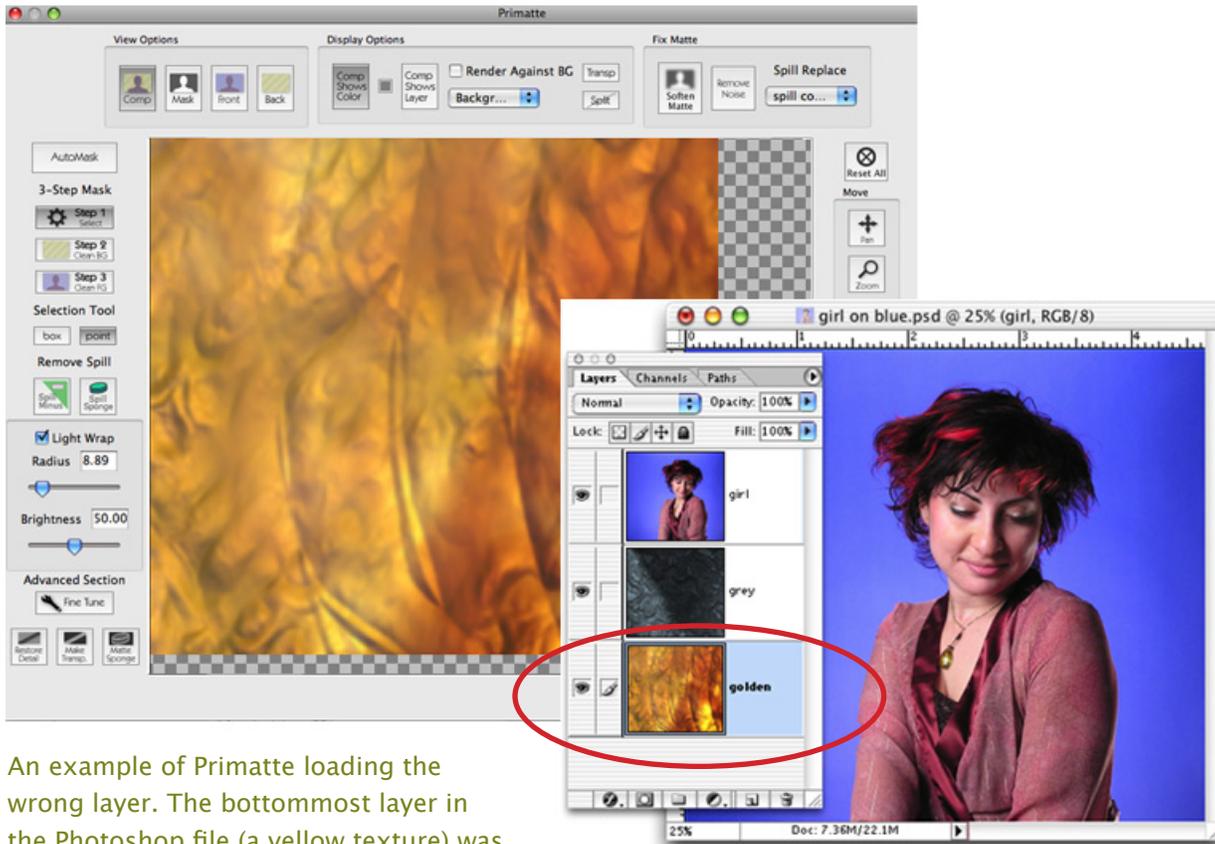
### Use the View/Pan tools

You can scrub around the Preview Window in a couple of ways. Use the View Plus, View Minus or View Numeric Input to set a zoom level. Hold your spacebar key down to get a grabber hand, just as in Photoshop, and pan around the photograph. There is also a Pan tool that moves around your zoomed image. Go to [Move Tools](#) for more info.

### Displays the selected layer

The Preview Window shows the layer in your Photoshop file that is selected. If you have accidentally selected a layer intended as the Background portion of your composite, you will see that layer, as in our example.

Primatte cannot automatically detect the layer that holds the bluescreen graphic. You need to tell Primatte what layer to use.



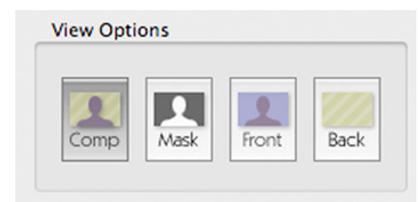
An example of Primatte loading the wrong layer. The bottommost layer in the Photoshop file (a yellow texture) was accidentally selected when Primatte was applied. The girl chromakey layer needs to be selected instead.

## View Option modes

There are four View Option modes: Comp, Mask, Front and Back. You will toggle mostly between Comp and Mask modes while you are creating your mask.

The summary:

- Comp: Displays the composite of your Foreground and Background.
- Mask: A grayscale representation of the mask that's been created.
- Front: Shows the original Foreground image, which is your chromakey photograph.
- Back: Shows the original Background image, which is the bottommost layer in your Photoshop file.



## Comp View

This mode changes the view in the Image Window to display the composited graphic of Foreground and Background. If a key has been pulled, then a composite of the Foreground with a background is displayed. The Background may be a layer in your Photoshop file, or a solid color generated by Primatte.

If a key has not been created, then the original graphic is displayed. This is typically a subject or object photographed against a blue or green background.



Comp View shows your mask as it is created. It displays either a see-through, solid, or custom background.

## Mask View

This mode changes the view in the Image Window to a grayscale representation of the mask that's been created.

- White represents 100% opacity, which is the Foreground object.
- Black represents 100% transparency, which is the Background area, the part you are deleting.
- Gray represents the different levels of transparency.
- Light gray means more of your image is retained.
- Dark shades of gray represent less of the image being kept.



Mask View is a black, white and gray representation of the Primatte mask.

## Render as grayscale

If Mask View is selected when you apply Primatte to your image, then the grayscale image is rendered.

Typically when you render out Primatte, you will have Comp View selected. Sometimes you will want to render out a grayscale image that matches your photograph. If you apply Primatte (hit the Apply button) while in Mask mode, your image will render out as that grayscale representation.

This is an advanced feature that allows you to create a grayscale image for design or compositing effects. For example, use the grayscale render to create a Layer Mask in Photoshop, which will enable you to do more advanced compositing.

If you're working in video or motion design, you can bring this grayscale graphic into a compositing application like Adobe After Effects. Use the grayscale image as a track matte, displacement map or blur matte.

### Front View

Shows the original photograph that is being masked. Toggling back to this view is helpful when looking for lost detail, semi-transparent areas, or noise that needs to be removed.

### Back View

Shows the Background image. The background is either the bottommost layer in your Photoshop file, or a solid color that is generated by Primatte.

### Toggle your Views

Reality check! It's a good idea to switch between views of your composite. Don't get too comfortable staring at your mask from one perspective only. Toggling between the different View modes will help to determine if your mask and composite are correct.

You can also change your monitor brightness – yes, a hardware solution – to see if the image looks different.

### Toggle Comp and Mask View

It is especially helpful to click back and forth between Comp View and Mask View. It's often smartest to build the mask while in Mask mode for a clean view of the mask, then switch to Comp View to see how it looks. And vice-versa. The composite may look good in Comp mode, but when you look at the mask as a grayscale image, you will see obvious flaws like gray pixels that need to be removed.

### Toggle Comp and Front View

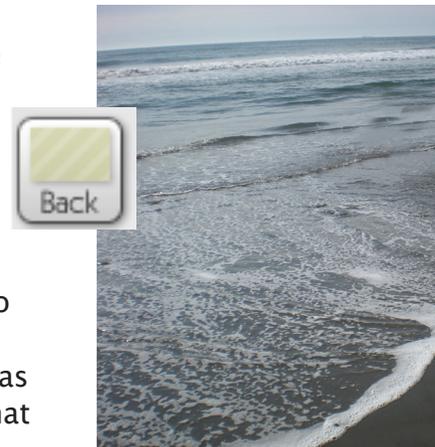
The Front View is a great way to check the accuracy of your mask. If you compare the Front image to the Comp image, you will be able to see if fine details have been accidentally removed, like wispy hair or the blue of someone's eyes.

### Check after spill correction

The View Options aren't just for creating a mask. Make sure to look at different views after you have corrected the image for color spill. Often spill issues that are undetectable if you don't switch between View modes. Also, doing spill correction sometimes shifts the mask a bit, especially if you overcorrect the spill.



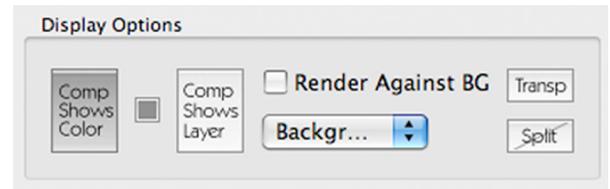
Front View shows the original image that you are masking.



Back View shows the background image, which is either another Photoshop layer or a solid color.

## Display Options

Display Options are for preview purposes only. The Display functions have no effect on what is finally output back into Photoshop, but can be critical in seeing any problems with the key. All of the Display Options are for looking at your photograph in [Comp View](#).



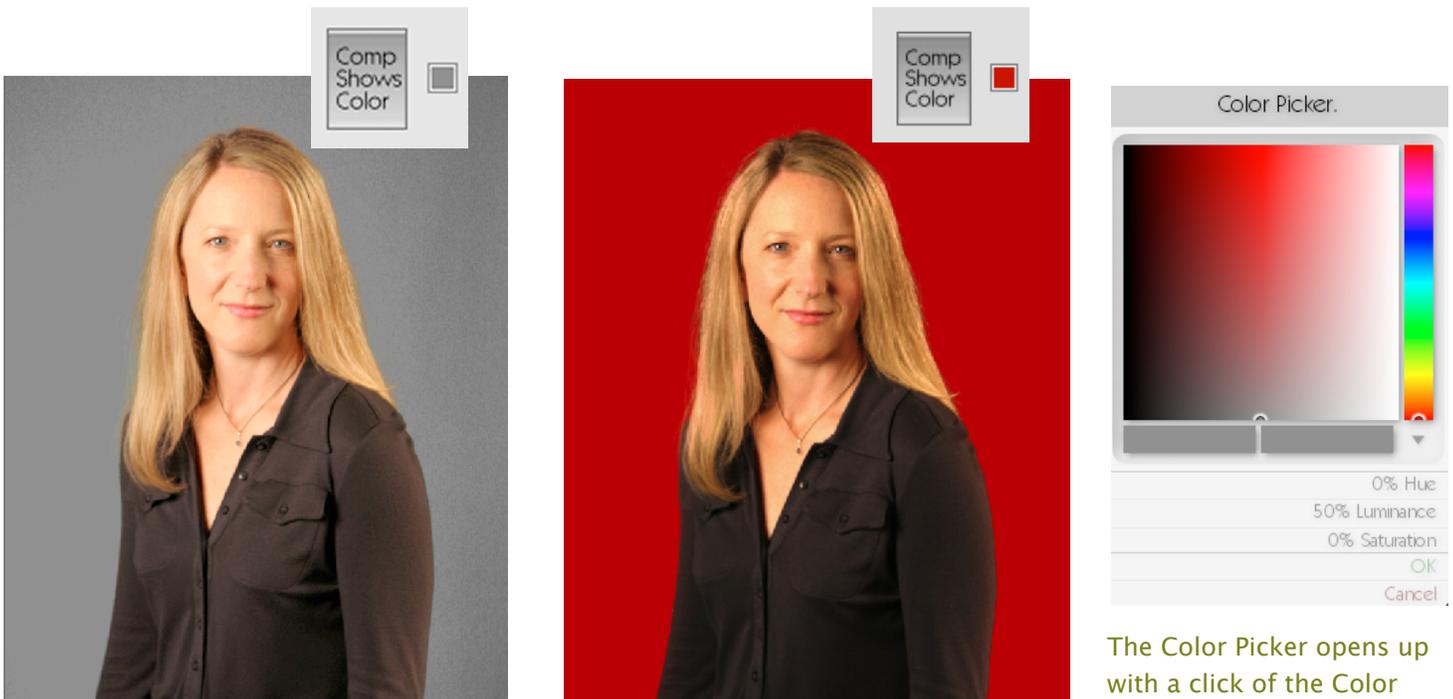
### Comp Shows Color button

The default option. Displays a solid color behind your subject when Comp View is active. The default color is medium gray, which is a neutral viewing color.

To change this color, click inside the Color Well. This brings up a Color Picker that lets you choose a different color background. When you click OK, the Color Well updates, as does the background color.

By default, this solid color doesn't render out to your Photoshop file. It is for viewing purposes only. If you have a red solid displaying and click Primatte's Ok button to render, the result will be your subject on a transparent background.

The exception is if you have the Render Against BG checkbox turned on. In this case, the solid color will render in place of the transparent pixels. See [Render Against BG](#) for more details.



Default gray and a new solid color loaded into Comp Shows Color.

The Color Picker opens up with a click of the Color Well. Choose a hue and a tone to define a new color.

### Contrast color with your subject

Working in Primatte against a solid color background is helpful when you need a harsh contrast color to bring out the problems with your mask.

For instance, in our example below, you can see the blue color spill in our model's hair when she is against a red background. But the spill is less noticeable against a yellow background, and very difficult to see against turquoise.



Three solid colors loaded into Comp Shows Color. Each displays the blue spill differently.

### Comp Shows Layer button

Comp Shows Layer lets you preview a layer in your Photoshop file. This option is great for determining any mask or spill problems while looking at the target image.

This option is turned off by default; meaning, the Comp Shows Color is active initially.

The advantage of working with this option turned on is the ability to preview your composite as it will look once Primatte is applied, the mask permanently created, and a new background shows behind the subject.

### Preview the bottom layer

By default, the bottommost layer in the file is displayed. If you have multiple layers in your Photoshop files, the layer at the bottom of the layer stack will preview. You can change this display with the Comp Shows Layer popup.



By default, this layer preview doesn't render out to your Photoshop file. It is for viewing purposes only. When you click Primatte's Ok button to render, the result will be your subject on a transparent background.

The exception is if you have the Render Against BG checkbox turned on. In this case, the layer graphic will render in place of the transparent pixels. See [Render Against BG](#) for more details.

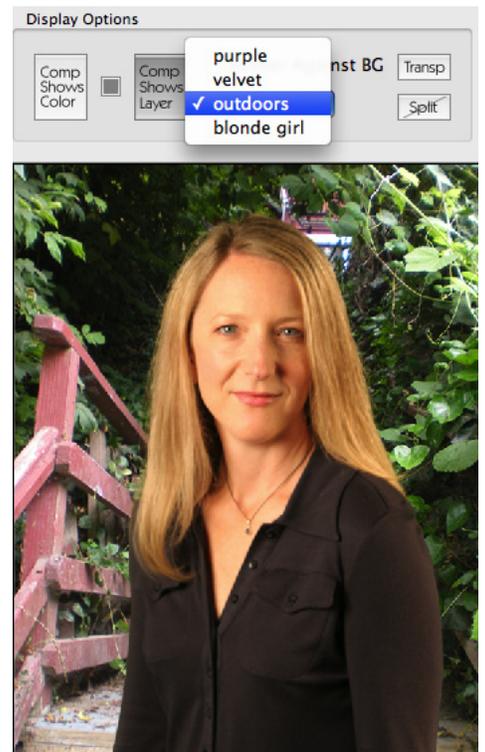
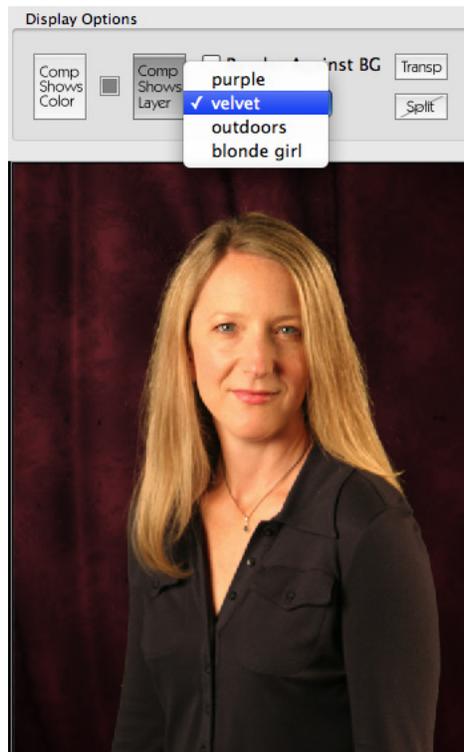
## Comp Shows Layer popup

Comp Shows Layer lets you preview a layer in your Photoshop file. This option is great for determining any mask or spill problems while looking at the target image.

The popup mirrors the layers in your Photoshop file exactly. It even displays your subject layer, although choosing that will not have any helpful effect. If your layer is unnamed ('Layer 1', 'Layer 2') then that default name will display. It's helpful to give your layers unique names so you know which to choose in the popup.



Three layers loaded into the Comp Shows Layer popup, each corresponding to the source Photoshop file.



## Render Against BG checkbox

This function was greatly requested from Primatte 3.0 users, so here it is! When this option is checkmarked, the image that is previewing via either Comp Shows button will render into your Photoshop file.

Turned off by default, which means the preview image does not render and transparent pixels show.

The benefit of Render Against BG is that you can more automatically create a composite with Primatte. Without the option, there are at least two steps to creating your composite: One to render the Primatte mask, one to merge the Primatte layer with the new background in your Photoshop file. With the option, you only have one step because no layer merge is required.

This is a terrific function for photographers who are processing large groups of photos and want to save time.



Three layers loaded into the Comp Shows Layer popup, each corresponding to the source Photoshop file.

## Transp, Split buttons

By default, Primatte initially previews its mask in 'composite' mode, which means you see a solid or graphic background where the mask is built. To see a different view, click the Transp or Split buttons, which are initially turned off.



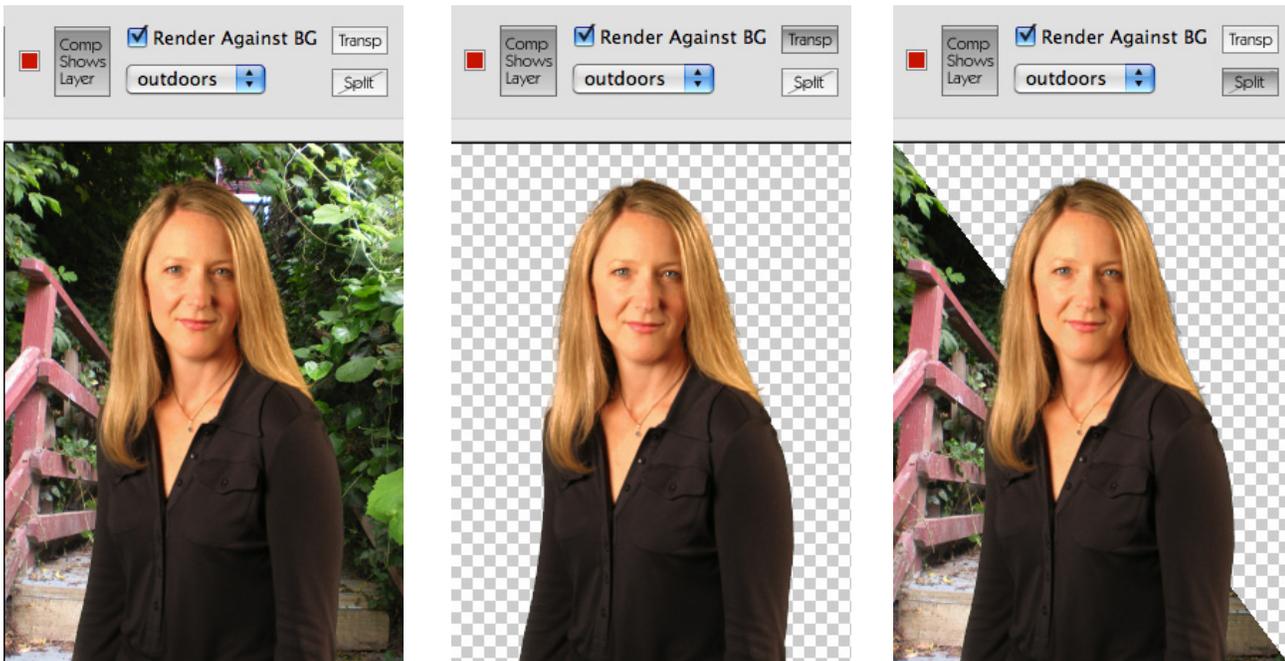
Click the Transp button to see a checkerboard transparency indicator where the Primatte mask is.

In Photoshop, the checkerboard pattern indicates transparency in the layer, and it means the same thing in Transp mode. If you see the checkerboard pattern in Primatte, you should see the checkerboard pattern in Photoshop once you click OK and render Primatte. Toggling the transparency on and off is generally the best way of checking the result of your mask.

Click the Split button to see half checkerboard transparency and half composite. A diagonal line indicates the division.

The Split button attempts to give you the best of both worlds by making the background half transparent and half solid. This can be a very useful mode since it simultaneously show you how the key looks against a background image and if there's anything odd that shows up against transparency.

When neither button is active, Primatte shows your mask again with its default composite view.



Left to right, the default composite view, Transp mode and Split mode.

### **Which Preview/Display should I use?**

We have talked about a lot of ways to look at your mask and composite. There are four View Options and five Display modes. How do you know which method to use?

The answer is that there are advantages to using all of these methods. No one view is correct. Typically, you will change between a few View and Display modes during your Primatte session, depending upon what work is needed.

For instance, There are advantages to previewing against a gray background, which is the default color for Comp Uses Color. Gray is neutral and can be easier to see green/blue spill than a checkerboard grid.

For identifying transparency problems, the Transp or Split checkerboard mode is recommended. The checkerboard pattern makes it pretty easy to see where Primatte is deleting pixels. Sometimes previewing against a solid or graphic layer can hide problem spots. You can see in the images below, with a gray background the problem area in the hair is not immediately noticeable. However, with a checkerboard pattern, it pops out and is easy to see.

For color spill problems, either a gray background or the background you're going to composite it over, using Comp Shows Layer, is recommended.

## Move Tools

It is easy to move around the Preview Window and interact with the masking process. This section explains the Move Tools.

### Pan

The Pan tool moves the image around the Preview Window. When a photograph is zoomed in, you can't see the entire image without scrubbing it. Alternately, you can hold down your spacebar key to get a grabber hand that will pan the image.



### Zoom

There are multiple ways to zoom in and out of your Preview Window. The Zoom tool lets you magnify or demagnify by clicking in the window and dragging your cursor to zoom in or out. Essentially, you are scrubbing the image to magnify it. Alternately, use the key commands Control-Plus/Minus [Win] and Command-Plus/Minus [Mac].

### Zoom Reset

Resets the Zoom level to 100%. You will see the entire photograph that is loaded in the Preview Window.

### Zoom Plus, Minus, Numeric

The Zoom Box contains alternate ways to zoom in and out of the Preview Window. Click the Zoom Plus to increase magnification. Click the Zoom Minus to decrease the zoom.

In the Zoom Numeric field, you can type in a custom magnification, then click inside the Preview Window to make the zoom happen. (The Return and Enter keys don't have an effect.)



Zooming to 300% allows us to see some color spill in the hair that isn't viewable at 100%.

## Assist Tools

The Assist tools perform general purpose tasks in Primatte.

### Reset All

Resets all of the Primatte settings to their default state. You will lose any changes that have been made with the Mask, Spill, Fix Matte, View and Move tools.

Reset All is the perfect choice when you've made many changes to your mask and don't like of the results. Click Reset All to return to the default, unmasked state. This operation cannot be undone, so be careful using it!

### Undo, Redo

Cancels or reinstates the previous Primatte operation. The levels of Undo/Redo are unlimited.

### Mark, Recall

The Mark button saves settings for later use. The Recall button brings back the last settings that were marked.

These tools only operate within a given work session. Once you have clicked the OK or Cancel button, the mask you've built in Primatte is either created or discarded. When you reapply Primatte, you can't retrieve Mark settings by hitting Recall.

Mark and Recall do not work between multiple photographs. They only save/retrieve mask settings for a single Photoshop file.

### Save settings between sessions

Primatte saves its mask settings between sessions. We define a 'session' as any time you close the Primatte interface. This could be to load up a new image or to shut down Primatte or Photoshop.

Either way, Primatte will remember the last settings that were applied with the OK button. If you click the Cancel button instead, then Primatte remembers the settings that were applied previously with the OK button.

Primatte also saves mask settings between graphic files. This can be useful if you are processing multiple images. If you apply the Primatte mask, open a different Photoshop file, and then reapply Primatte, your mask will redraw itself. The mask will also redraw itself if you OK the Primatte mask, then quit Photoshop, reopen Photoshop and reopen Primatte.



This memory function is very helpful because it allows you to use the same mask settings on multiple photographs. Let's say you are working on 10 photos of a blonde girl standing in front of a chroma-blue background. When you

It is this memory function also that makes Primatte so successful in working with Photoshop Actions and Batch processes. Read more in the [Actions & Batching](#) section.

If you don't want to use the retained mask settings, just click the Reset All button to erase Primatte's memory.

### OK button

The OK button applies the mask you've created. The Primatte interface closes, and the mask renders in Photoshop.

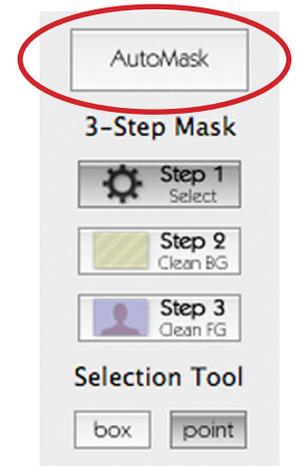


### Cancel button

The Cancel button takes you out of the Primatte interface and back into Photoshop without applying any Primatte changes. The mask that you had been editing is not remembered for later use.

## AutoMask tool

The AutoMask button will automatically create a Primatte mask. It is truly a one-click solution. AutoMask can be 'Always On' or applied as needed. Alternately, there is a 3-Step Mask process that can enhance the AutoMask results or be used instead of AutoMask.

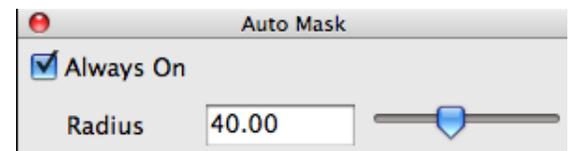


## Using AutoMask

Using AutoMask is pretty simple. You turn it on by clicking the Always On checkbox. This checkbox serves as an 'apply' button for AutoMask.

AutoMask will run the Primatte algorithm on your photograph and apply a mask. You can accept this mask and go on to other things, like dealing with color spill or clicking OK to apply Primatte. Or you can make adjustments to the mask with masking tools like Clean BG and Clean FG.

When you click the AutoMask button, a dialog box opens. Usually, you don't need to change settings in the AutoMask dialog since the defaults work pretty well. Let's take a look at the two AutoMask tools, Always On and Radius.

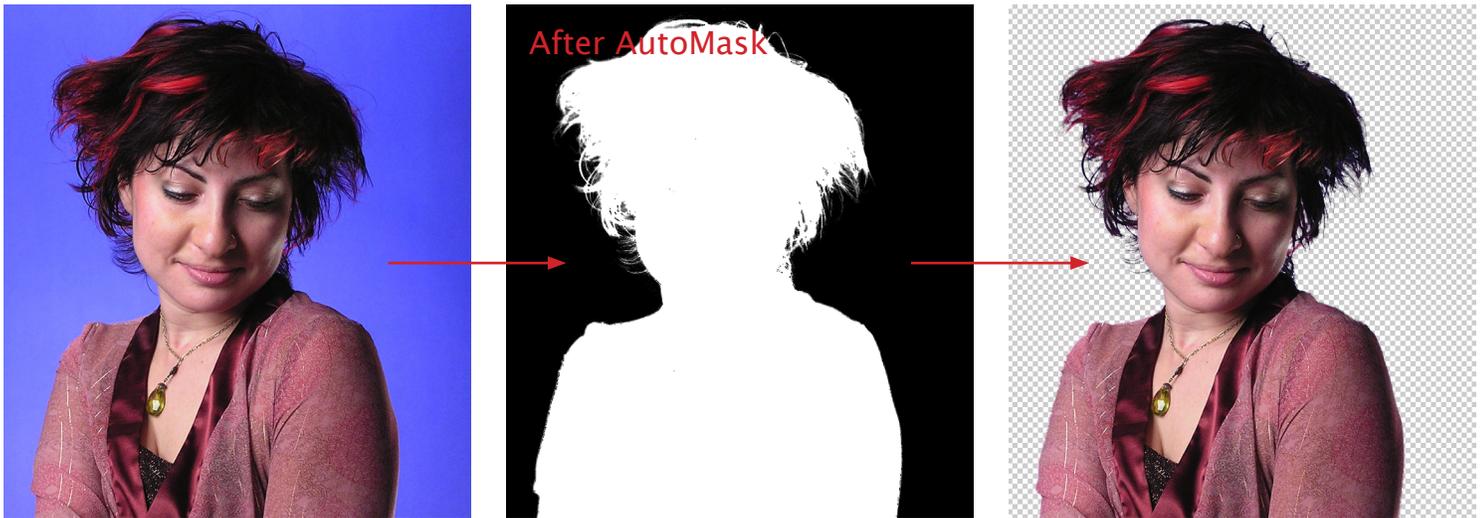


## Always On checkbox

Always On is turned on (checked) by default. If Always On is kept on, AutoMask will automatically create a mask on your image. You don't even need to click the AutoMask button! Primatte runs its masking algorithm as soon as the Primatte interface is open. You just check to make sure the mask looks good.

If Always On is turned off (unchecked) then Primatte does not automatically apply its masking algorithm. To use the AutoMask feature, you must click the AutoMask button to open its dialog box, then check the Always On button. Now Primatte will run its one-click masking algorithm. To close the AutoMask dialog, just click its close button.

This checkbox is very useful if you want to eyeball each image but let AutoMask do the work. The Always On checkbox is also critical for Batch processing with Primatte in Photoshop. If it is on, then whenever you load the Primatte interface, AutoMask will automatically be applied to your photo without you doing anything.



With just a click, the AutoMask tool creates a clean mask on our subject.

### Radius slider

Radius controls how much of the background Primatte will get rid of. The value range is 0 to 100%. By default, Radius is set to 40%.

The default setting of 40% works well on most images. Setting Radius too low can result in too much color being left around the edges. Setting it too high will cause fine detail, like hair, to be lost.

If you're not getting good results with AutoMask, try adjusting the Radius slider. Once you change the Radius value, Primatte will re-render AutoMask and produce a different mask.

The usable range is really between 30% and 80%. However it's worth testing on a sample of your images to find the value that works best for your images.

### Use for batching photos

The real power of AutoMask happens when Primatte is used in an Action or Batch. For photographers who process large volumes of images, this is an important feature.

You create an Action that uses Primatte, turn on AutoMask, and then apply the Action via Batch to a folder full of images. Of course, you can apply it manually to individual images, but the real power is when you batch it on hundreds of images.

The real power of AlwaysOn comes when you apply Primatte via an Action using the Batch menu command (File > Automate > Batch) in Photoshop. Read more about Always On in the [Actions & Batch section](#) of this manual.

### Best for head, shoulder, 3/4 shots

Now that we have discussed the incredible automation of AutoMask, we want to point out that AutoMask does not work on every photograph. It is really designed to work on head, shoulder and 3/4 length shots.

It will not typically work on full-length shots. If you can see the subject's feet standing on the greenscreen, AutoMask probably will not work (though it's worth a try).

One of the ways AutoMask determines the correct color is by analyzing the right, left, and top of the image. It's important that your chromakey screen covers the entire background behind your subject. If the wall behind the greenscreen is showing along the sides or top, you will need to crop the image before AutoMask will function correctly.

### How to shoot for AutoMask

For AutoMask to work its best, you should have a subject that has been photographed properly for chromakey. The key ingredients for AutoMask are:

- Flat, consistent color along the back screen. Avoid hot spots.
- No wrinkles. A few small ones are ok, but the fewer the better.
- No shadows. Make sure that your model is posed 6–10 feet from the screen so she doesn't cast an unwanted shadow.
- The background is slightly darker than the foreground, but still vibrant. A background that's too dark will blend with the foreground and create problems.

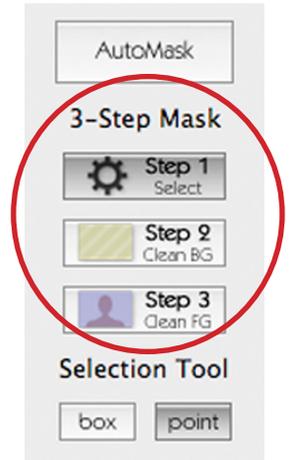
If your shots follow those basic rules, you should be in good shape to let AutoMask do the work for you. Of course, there will always be some photographs that don't quite get the mask correctly, and that's where our 3-Step Mask tools come in. Read about them in the next manual section.



A photo that will work well with AutoMask. Note that there is no green beneath the subject as you would have in a full length shot. The Chromakey screen covers all of background and most of the right, left, and top edges.

## 3-Step Mask Tools

The 3-Step Mask tools are three simple steps to creating a mask in Primatte. All three tools work with a click-drag in the Preview Window. Use these if you want the ultimate control over your mask or if you have a problematic photo. Alternately, the [AutoMask](#) tool will create a mask with a one-click process. You can also use the 3-Step tools to refine a mask that AutoMask has generated.



### Step 1: Select tool

When doing the 3-Step process, the Select tool is the first step. Click in the blue or green background with the Select tool. This click sets a pixel or range of pixels as the color sample point.

Sample the key color within the image window to select that color for removal. You only need to click-and-drag once to set the sample. You can click-drag again, but that will replace the initial sample. It is important to choose an area of the back screen that has a flat, consistent, mid-range color tone.

Once you've applied the Select tool, if you don't have a background layer in your Photoshop file, a gray background will preview. This is the default Primatte color and can be changed with the [Comp Shows Color](#) option. If you have additional layers in your Photoshop file, you can choose to preview any of those layers with the [Comp Shows Layer](#) option.



Our original photograph.



After the Select tool has sampled where the red X is. Shown in Comp View.



The Select sampling in Mask View.

## Step 2: Clean BG tool

Clean BG is the second in the 3-Step process. This 'BackGround' cleanup removes any background artifacts and noise. These are pixels that should have been removed by Primatte but were missed in the initial sampling with the Select tool. In Comp View, they appear as dark color pixels. In Mask View, they appear as white or light gray pixels. (Look at the Select tool's results shown below.)

This tool samples pixels on the Preview Window known to be 100% background. White or gray noisy areas will become black.

You do not need to remove every single white pixel to get good results. Sometimes increasing the brightness of your monitor or the screen gamma allows you to see noise that would otherwise be invisible. Most pixels that are displayed as a dark color close to black will become transparent once Primatte is applied.

In fact, if you meticulously try to remove every bit of noise from around the foreground subject, a smooth composite image is often difficult to generate. When clearing noise from loose, flying hair or any background/foreground transitional areas, be careful not to select any of areas near the edge of the hair. Leave a little noise around the hair since this can be cleaned up later using the [Spill Correction tools](#).



The Select results in Mask View.



The Clean BG results in Mask View. Red lines indicate where we dragged the tool.



Once Clean BG is used, the background area is cleaned up of white pixel artifacts and noise. Shown in Comp View.

## Step 3: Clean FG tool

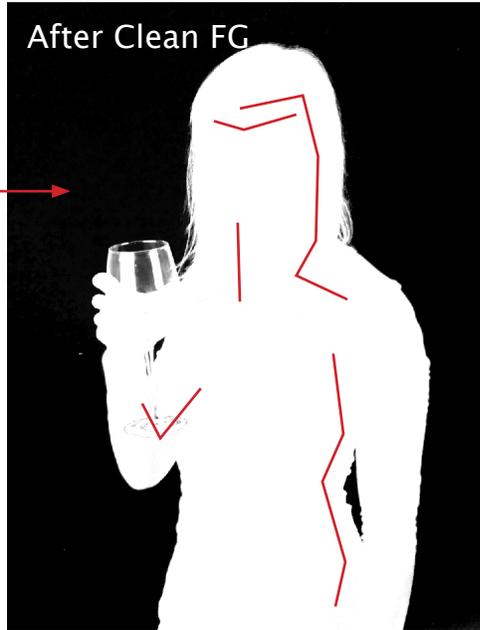
Clean FG is the final step in 3-Step masking. This 'ForeGround' cleanup removes any foreground artifacts and noise. These are pixels that weren't initially recognized by Primatte as part of the subject that is retained. In Comp View, they appear as light color pixels. In Mask View, they appear as black or dark gray pixels. (Look at the Clean BG tool's results shown below.)

This tool samples pixels on the Preview Window known to be 100% foreground. Black or gray noisy areas will become white.

As with Clean BG scrubbing, you do not have to remove every black or gray pixel to get good results. Also, it's important to pay attention to where you drag. You should only sample fully opaque areas. If you sample semi-transparent areas like wispy hair or a glass object, then you will accidentally add background into the foreground selection.



The Clean BG results in Mask View.



The Clean FG results in Mask View. Red lines indicate where we dragged the tool.



Once Clean BG is used, the background area is cleaned up of white pixel artifacts and noise. Shown in Comp View.

## Use 3-Way to clean up AutoMask

Another use for the 3-Step Mask tools is as a helper to the AutoMask tool. AutoMask typically creates a great mask with one click but sometimes it can use a little help.

For instance, in the example below, AutoMask got the mask 95% complete. The part circled in red has white artifacts that were not picked up by Primatte. In the original greenscreen photo, you can see that green area is darker than the rest of the back screen, which throws off the Primatte mask.

We want to delete those extra white pixels and the Clean BG tool is a perfect solution. Just drag Clean BG along that black background area to clean it up.



## Selection Tools

The Selection Tools give you two options, Point or Box, to manually select pixels for Clean BG and Clean FG. Which tool works best for you will depend on your images. It's possible to use either tool exclusively, but some images are better suited to one or the other.

### Point Selection tool

When selecting pixels with Clean BG or Clean FG, the Point tool will create a trail behind it as you clicked and drag. This creates a line in the UI.

Consider the Point tool as the fine detail selection tool. It is great if you're trying to get some last bits of gray on the edge of the hair line, but it can require a lot of scrubbing to get all of the gray pixels in the center portions of the image.

Quite often when you use the Point tool, there will be a few pixels left here and there. You'll have to drag exactly over them to get rid of them.

### Box Selection tool

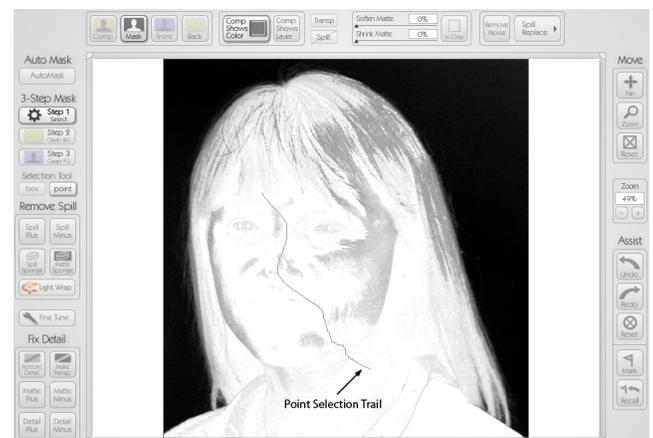
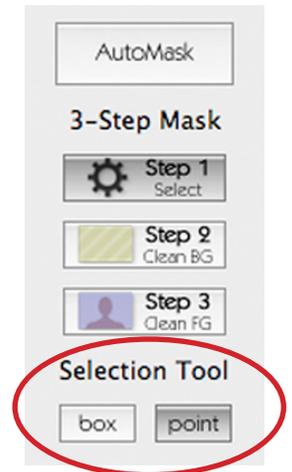
The Box tool lets you click and drag a box, creating an area selection. All the pixels that fall within that box are cleaned up in both Clean BG and Clean FG. This works well for large areas, but can be tricky to use around corners or in small areas.

As you drag the box out you'll see a light gray box appear with a shaded interior. Any pixels included within the gray box will be cleaned up.

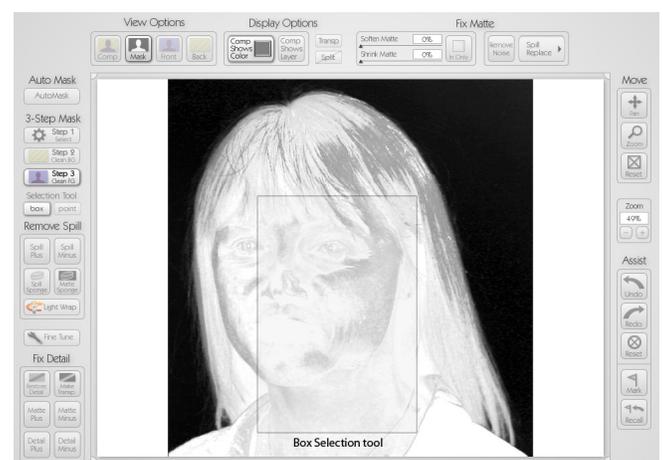
### Try, then try again

When working with Primatte, you need to figure out what pixels to click on in order to make Primatte work the best. Primatte works by looking at the most representative colors of the background and finding them throughout your image.

You may go through a few trial and errors sessions, figuring out which sampled pixels would maximize the masking and spill removal tools.



Point Selection.



Box Selection.

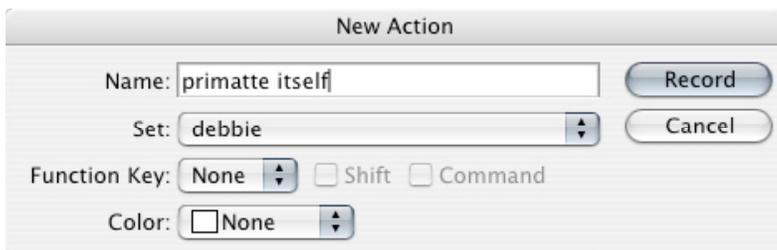
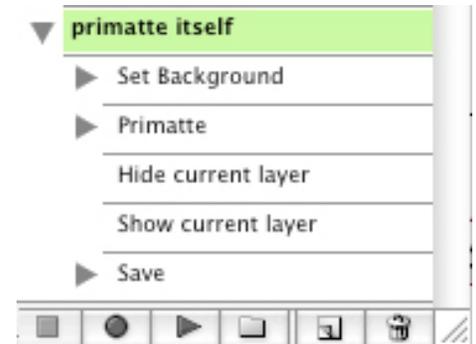
## Use Actions & Batching

Primatte fully supports Photoshop's Actions and Batch process. This process works especially well with Primatte 3.0's new Automask feature. Actions and Batches will work best on a group of photographs that were taken under similar lighting and environmental conditions.

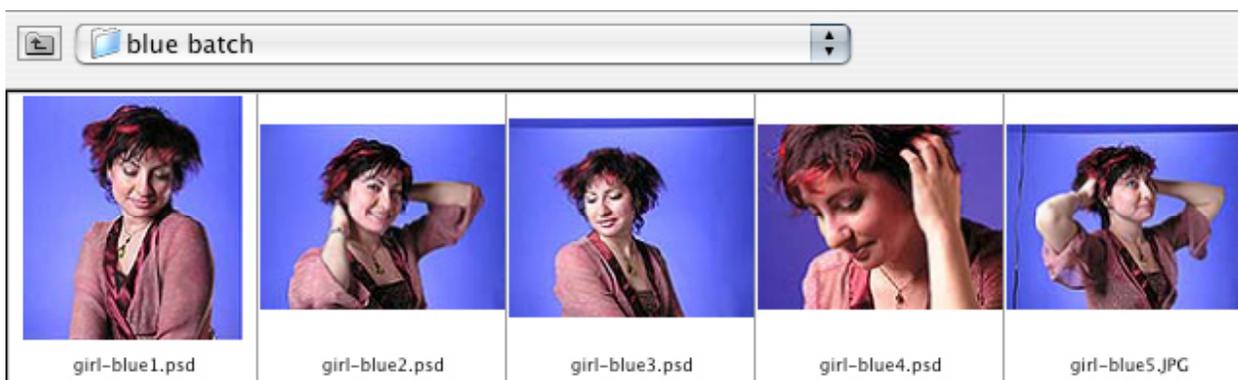
### Overview of workflow

The Action that you create retains Primatte's parameter settings, and applies them to another object. You are, essentially, pulling settings from one Primatte mask and bringing them over as a preset for the next photo. Open the Actions palette and create your settings.

Once you have created an Action for Primatte, you can apply the Action to a group of photographs. Select the File > Automate > Batch menu item and set up a process. That Action will apply the same mask settings to all of the photographs that are batched.



A photo session that Primatte will Action/ Batch properly. The same model appears under the same lighting and back screen.



## Always On checkbox

The Always On checkbox in the AutoMask dialog box is critical for Photoshop's batch processing.

If this option is turned on, whenever you load Primatte, AutoMask will automatically be applied without you doing anything. This creates an 'in-between' workflow which is half manual, half automatic.



AlwaysOn must be turned on if you're going to use Primatte in an Action. If it isn't, Primatte will just apply the settings from the last image to the new image. If you're dealing with different backgrounds, children with different hair color or whatever, this will give you very poor results.

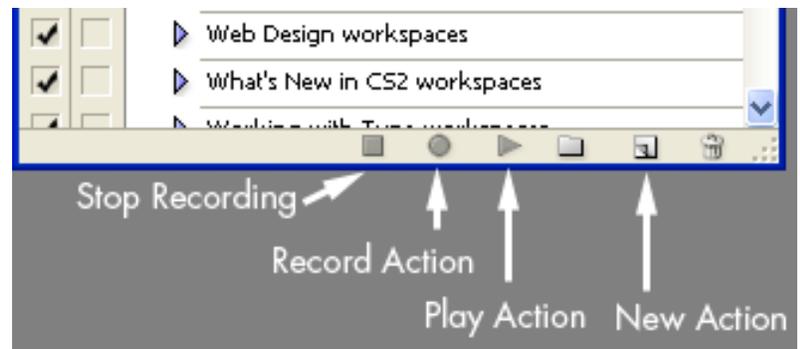
When AlwaysOn is turned on, Primatte analyzes each image separately, pulling the best key for each image. What the settings were for the previous image don't matter and are discarded as soon as the new image is loaded.

## About Actions

In Photoshop you can record the things you do. These recordings are called Actions.

For example, if you have a lot of images you want to crop down to a specific size, you can record yourself cropping one image, saving it, then closing. You can then open up each image, and just apply the action instead of going through each of those steps for each image.

You can even take it further. Under the File menu there's an Automate sub-menu. There you'll find the 'Batch...' command.



## About Batch processes

Batch allows you to run an Action on entire folders full of images. So instead of opening each image and applying the action, you use Batch to apply the Action to each folder in an image. Photoshop opens each image, automatically applies the specified Action, and then does the same thing for the next image, and the next, and so on.

This is an extremely powerful workflow and you can use it with Primatte and AutoMask.

Simply record Primatte as part of an Action. If you have 500 school photos in a folder, you can apply the Action to all 500 photos. Your computer may work for a few hours, but you don't need to attend to it.

After it's done, Primatte will have been applied to all 500 photos and removed the background. You can even use the Action to insert a new background if you want! There are some things to know, though...

## Training for Actions

If you don't know how to use Actions or Batches, there's great information in the Photoshop help documentation. We also have a great training video on our web site that shows you exactly how to do it. (Like all our training, it's free.)

It's much easier to show you how to create the Action using video than to try and describe it in this manual, so please refer to the web video if you need more information on Actions. However, we will discuss the basics here.

## How it works (Actions)

You start off by opening an image and then clicking on the New Action button (see above). This will ask you to name the Action, and once you hit OK, Photoshop will record every move you make.

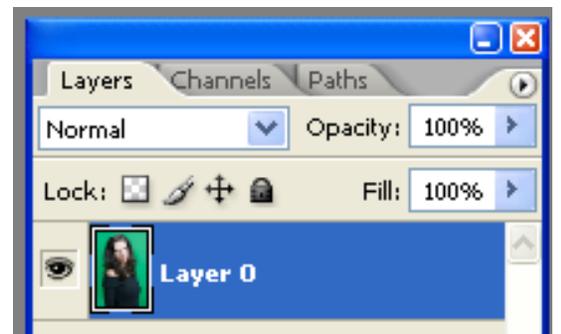
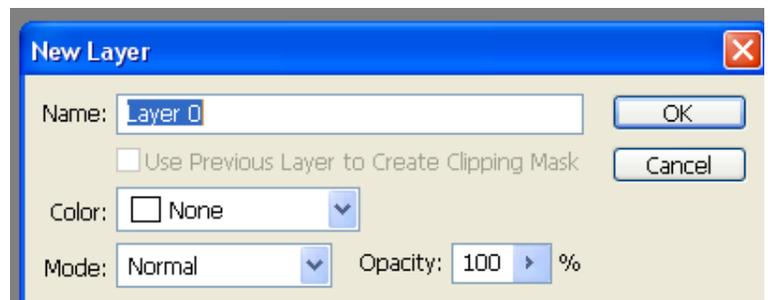
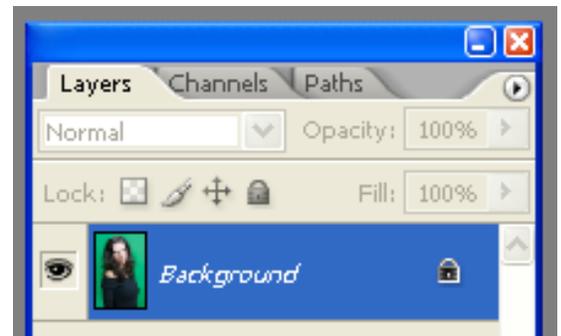
### Double-click the background layer

When using Primatte, the first thing you usually have to do is change your photo from a Background layer to a regular layer. When you bring the photo from your camera into Photoshop, it's either a JPEG file or a RAW file.

In either case, Photoshop opens the file and makes the photo a Background layer. This type of layer can not have transparency so you don't want to apply Primatte to it.

You want to change it into a regular Photoshop layer first. Primatte can then delete the background and replace it with transparency, so you can drop in a different background behind it.

It's easy to do. All you have to do is double click on the Background layer. This will bring up a dialog asking you to name it. You can give it a name or just leave it as 'Layer 0'. Once this is done, you can apply Primatte.



## Apply Primatte

The next step is to apply Primatte to the image. When you apply Primatte, click on the AutoMask button and turn on the AlwaysOn checkbox. Click on the OK checkmark to apply Primatte to your layer. You should now be back in Photoshop with the green/blue background removed.

At this point you can click on the 'Stop Recording' button in the Actions palette or you can do other things like save the image, copy in a background from a different file, or many other things. All of which will be recorded to the Action until you hit the Stop Recording button.

As mentioned, this is a little easier to show in a video than describe in print, so if you're still unclear on how Actions work, please check out our free video training on our web site.

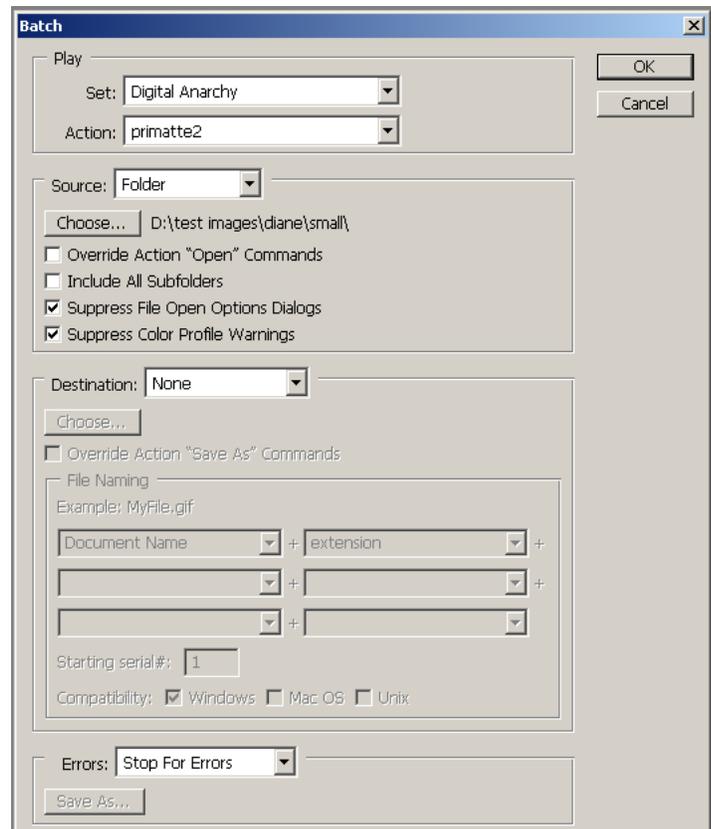
## How it works (Batches)

Now that you've got the Action created, we can start the business of applying it to all of your images.

The hard way of doing this would be to open each one in Photoshop and apply the Action individually. However, since that's a pain in the ass and you have better things to do with your time... We'll use the Batch function under Photoshop's menu File > Automate.

Batch allows you to specify an Action and a folder to apply it to. There's a couple checkboxes to deal with and you can also specify a folder to save the 'actioned' images to, but it's a very easy process.

This is a great way of applying Primatte to hundreds of images at once. Photoshop will open up each image, apply the steps of the Action and then save everything back out. You'll need to make sure you follow the steps that we list out in the Action section, but if you do, you should get good results.



We recommend that you set up a test folder with just a few images in it. Actions can sometimes not behave as expected and you want to run them on half a dozen images before trying to apply them to hundreds.

You could also accidentally save over your original files, so you want to make sure you have the originals backed up onto DVD or in a different folder before running the Action.

We have more information on Batch in our video tutorials and Photoshop also a good deal of resources that talk about it. It's a very powerful feature for doing many things and now works very well with Primatte.

### Using Garbage Mattes

Occasionally Primatte can't target the color that needs to be removed because of a wide range of color tones. This situation is typically due to poor lighting conditions during the photography session. In these situations, you can make Primatte work better and faster with some simple pre-masking, called a 'garbage matte'.

#### What is a garbage matte?

A garbage matte is a very simple, often crude mask. It is not used as the final masking element. Instead, it is used as a pre-mask. The garbage matte is either discarded or incorporated into a more finalized mask. The garbage matte creates a more uniform background color for Primatte to see. The fewer shades of color there are, the easier a mask is to create, and the more efficiently Primatte will work.

#### When to use a garbage matte

A garbage matte is often used when your photography session has not produced an ideal photograph to work with for chromakey purposes. The photograph is 'bad' if it has a single color background screen that was poorly or unevenly lit. Reasons include:

- A dark shadow is cast by the subject.
- A light hit the screen too brightly, leaving a hot spot.
- The overall lighting was uneven, which creates a gradient of tones, from very light to very dark, behind the subject.
- The screen used has a slight texture to it, either a fabric weave or grain pattern.
- Your subject contains the color of the background screen.
- An superfluous object in the setup needs to be hidden or you can see the studio room around the screen.

In all of these situations, you will need to help Primatte recognize the foreground by limiting what it sees around that subject. To do so, you will create a garbage matte.



A hot spot appears behind the model, causing a major shift in tone from light to dark blue.



The screen has a subtle but difficult texture. Also, the subject casts a deep shadow because she is positioned too close to the screen.

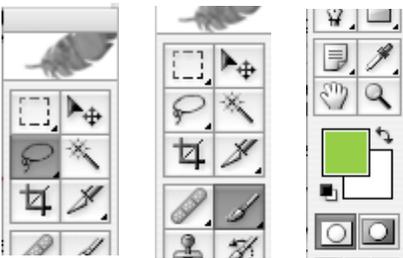
## How to create a garbage matte

There are a few ways to create a garbage matte for Primatte. In both methods, you create the garbage matte with Photoshop's tools BEFORE you enter the Primatte interface.

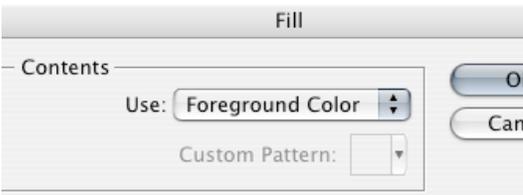
### Method 1- Paint out a problem area

One method of creating a garbage matte is to paint out the troublesome area with a solid color. That solid color should be a median value of the color range that you are trying to mask out.

If your problematic background is green, then choose a shade of green that's closest to the screen's primary color. You can typically use the Eyedropper tool to sample a color from your file.



**LEFT:** Clockwise, different Photoshop tools to paint a mask: Lasso tool; Brush tool; Foreground color swatch combined with the Fill dialog box.



**RIGHT:** The result. An uneven green area has been painted into a closer tonal range. The unwanted shadows and table surface have been 'greened' over.



### Method 2- Select an area to ignore

The other method to create a garbage matte is to make a selection around the area that you want to matte out. Make sure that the problem area is not within your selection. Sometimes it is actually easier to select the area you want to keep, then invert that selection using the command `Select > Invert`.

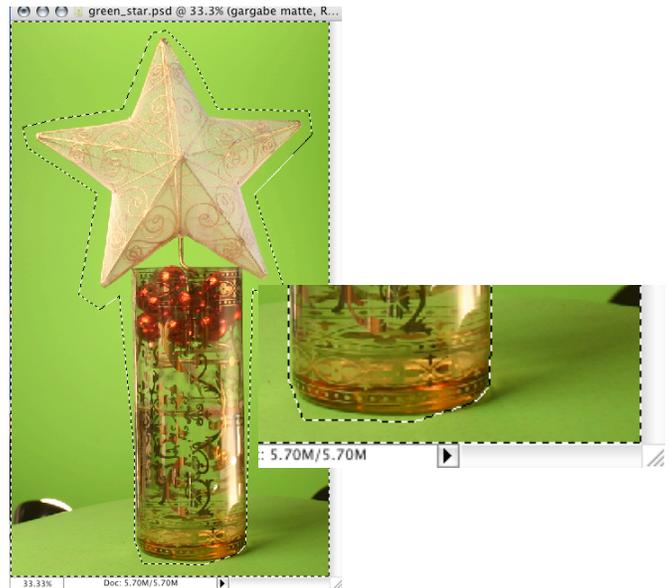
Once the selection is created, apply Primatte to open its interface. The entire photograph will display in Primatte's Preview Window. However, only the area that is within the selection will be affected by Primatte's tools.

Alternately, you can always hit the Delete key once your matte area is selected. Most people don't do this so they can preserve the whole image. However, this is certainly a valid way of completing the garbage matte process.

We made our selection with the Magnetic Lasso, using a Feather value of 0.



A dotted line encircles the perimeter of the file. This indicates that the area outside of the vase/star is inside the Selection.



## Add in lost foreground

If in either of the processes listed, you lose some of the detail that is inside of the subject area, then it is really easy to add this back in. You do this outside of the Primatte interface, back in your Photoshop file.

Simply open up your original image, copy the part of the image that you want to bring back, then paste it into your new file, the one that you have already run Primatte on. Glaringly simple, we know! But sometimes the most obvious solutions are overlooked at the expense of solving the problem in the special tool, so we wanted to point this out.

You can also accomplish this bringing back of details by using some of Photoshop's sophisticated tools, like the History Brush. (We have a great video tutorial that explains how to do this.)

## Split the image into sections

Sometimes a photograph is problematic enough that it is fastest to split the image into two or more sections and apply Primatte separately to each of these sections. You can accomplish this with a garbage matte or by dividing the image onto different layers. (Yet again, we have a great video tutorial that explains how to do this.)

## About Spill Correction

There are many ways to remove color spill in Primatte and we discuss them all in the following section. As you learn these spill removal methods, keep in mind that you won't need to use ALL of them on an image. Faster is better until that method doesn't work! As you get comfortable with Primatte, you'll develop your own favorite ways to approach problematic color spill.

## What is 'color spill'?

'Color spill' is unwanted color that appears on your subject. This happens somewhat unavoidably during the photography session, and needs to be removed afterwards. How does spill occur? Basically, light bounces off the background behind your photographic subject, making the background – your color screen – a light source in and of itself. That light throws a color on the subject, illuminating parts of the subject that are exposed to the wall.

If you threw a ball against the wall, the ball would bounce off and hit another wall. That's physics. In the process of bouncing light, the wall absorbs all the other colors besides itself, generally, then casts off its own color light. If the wall is blue, the wall absorbs all the other colors that are cast by the lights around it, and bounces back only blue.

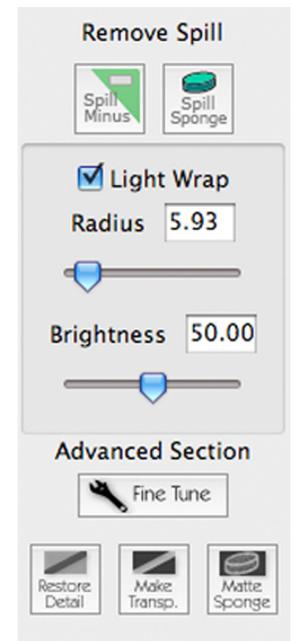
Color spill is often called 'blue spill' or 'green spill' depending upon the color of the chromakey back screen you're using.

## Two kinds of spill

There are two kinds of color spill: transparency and bounce.

'True spill' or 'bounce spill' shows up in the opaque areas of your subject. With bounce spill, you can generally just use the Spill Sponge tool. Sop that stuff up with a sponge, literally. The Spill Sponge is a one-click tool corrects blue spill quickly; is almost always the first tool you should try and will usually fix simple problems. [Read more here.](#)

'Transparency spill' is color spill in the transparent parts of an object. It's often more challenging to get rid of transparent spill. Using a fine detail tool like the Fine Tune tool is a good way to methodically go through the removal process. The Fine Tune tool is made up of three sliders that are great for cleaning up large spill areas, and making sweeping yet subtle changes. [Read more here.](#)



The plethora of spill correction tools, all explained in the following sections.

### How Spill Correction tools work

Like all of Primatte's tools, the Spill Correction tools look at the color tone you have clicked on, then find that tone distributed throughout the entire photograph. The tools don't look at or work on an isolated area. You click on a pixel or click-drag along a range of pixels, and the spill tool will correct the specified tone in all pixels in your image.

Primatte looks not just at the color you designate, but also at the color as it looks applied to a transparent or semi-transparent area. Because choosing that color is so important, Primatte gives you multiple ways to approach it. The following manual sections go over Remove Spill tools, which vary from a fast n' furious attack to a more methodical approach to detail correction. We also discuss the Advanced Detail Tools, which really provide a combination of spill correction and mask fine tuning.

### Be careful not to overcorrect

As you correct the color spill in your Primatte image, at some point, you may notice a point of diminishing return. This happens when you overcorrect the spill. We will point out examples of overcorrection as we talk about the spill correction tools.

### Artifacting

One problem to watch out for when doing fine adjustment work is 'artifacting'. An artifact is any feature in an image that is not present in the original subject or object. Pixels in your foreground image may become discolored or too bright and this creates artifacts. Artifacting can occur anytime when you are working in Photoshop, in particular when treating the edges of an object, and Primatte is no exception.

### Banding

Another overcorrection problem that can occur in Primatte is 'banding'. Banding is when previously smooth tonal values become clumped together. A color reaches a shade it can't go beyond and then colors clip together, becoming one value. You will often see banding when working with gradients in Photoshop or when importing a Photoshop gradient into another application.

When you see any of these problem areas arise, just back off the spill correction. If you're using a one-click tool like the Spill Sponge, you may do this by using the Undo button, then find a more gentle tool like Spill Minus. If you're already using Spill Minus, you can use the Fine Tool tool to make more incremental tweaks. All of Primatte's tools are easy to use so it is not hard to find a solution.

## Remove Spill tools

The Spill Removal buttons are great for simple, fast correction on your mask. You can look at them as ‘spill suppression’ tools that work on regions of color. The Spill Sponge is a one-click tool for heavy spill removal. The Spill Minus removes color spill in smaller, multiple-click increments. There is also a [Light Wrap tool](#) that we discuss in the following manual section,

### Spill Minus tool

The Spill Minus tool removes color spill from the sampled pixel color (and all colors like it). If spill color remains, another click will remove more of the color spill. Continue using this tool until all color spill has been removed from the sampled color region.

The Spill Minus is a multi-click tool. Click into an area that has some color spill edges, and click on a pixel with some spill on it. Repeated clicking on the spill color will incrementally remove the spill. If too much spill is removed and the area being clicked on looks unnatural, click on the area using the Spill Plus tool to return the color region to a more natural appearance.

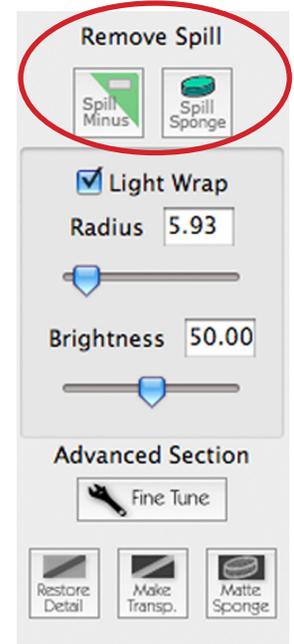
### Spill Sponge tool

You can look at the Spill Sponge as a ‘shortcut’ tool. It works great for simple, fast correction, basically sopping up the unwanted color much like, well, a sponge soaks in liquid. The Spill Sponge often solves your spill problem immediately, which means you won’t have to fool around with the other spill correction tools.

This tool keys out the background color component in the sampled pixels (or spill) within the image window, and removes it from the color region selected. The Spill Sponge is the fastest way to remove color spill from a composite image, because it removes the spill component in a single action at a preset amount.

It can only be used once on an particular color, and the amount of spill suppression applied is not adjustable. If you click a second time, you are resampling and reapplying the tool, therefore, the results of the original click are overwritten.

Spill Sponge is often the fourth and final step in using Primatte, unless additional adjustments are necessary. For more accurate spill suppression, the Tune sliders or Spill Minus tool could be used instead.



### How it works

Select the Spill Sponge button to sample away the spill areas. Position your cursor over a green pixel, click to select that pixel, and the green will be replaced by a more natural color. You are telling Primatte to recognize a hue as incorrect.

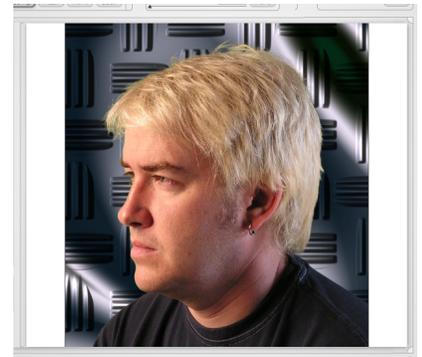
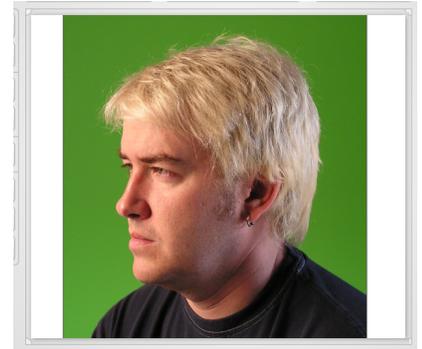
Spill Sponge is a one-click tool. Clicking a second time will simply override the correction that was created with the first click, as you are setting down a new sample point for Primatte to work from.

If the Spill Sponge doesn't correct your image with a first click, try clicking in a new area. It may be a matter of finding the correct sample point, and often this is a trial-and-error process.

Instead of simply selecting an area, the Sponge automatically performs a correction on the area it has targeted.

### WORK TIP

The Spill Sponge is also good for creating quickie low resolution pre-visualizations. For instance, you may want to see how your subject will look against a potential background, but you don't want to waste time creating a perfect mask.



The Foreground subject before and after Primatte. We've used the Spill Sponge to clean up green spill.

## Example of Spill Sponge

### Spill Problem

Once a mask is created, the edges of the model's blonde hair have picked up a green reflection from the green backdrop. This is a common problem with flyaway hair, especially light blonde, and fixing it is one of Primatte's specialties.



### Click Sponge

After the Spill Sponge. The green tinge has been mostly corrected with a single click. We've left a little green in, though, because otherwise the Spill Sponge will overcorrect to red (see below). We can finish the spill correction with another tool.



### Over Correct

Here the Spill Sponge has over-corrected by adding too much red, which results in a pink tone. This may have happened because we sampled from an area that wasn't green enough. Or it could be that the Spill Sponge tool was simply too strong for the small amount of spill present.



### Light Wrap

Light Wrap is the secret to seamless integration between the subject and background. It is also a Remove Spill tool though it is not a 'one-click' tool. Use Light Wrap to eliminate spill around the edges of your foreground subject, and make the edges of the foreground blend better with the background.

### How it Works

It works by wrapping the edges of a foreground layer with soft light from the background layer, producing a powerful level of integration by providing the illusion that light from the background layer is reflecting along the edges of the foreground.

One of the problems you frequently run into with compositing against a different background is the foreground subject looks cut out. This can be caused by a variety of things, but one of them is the lighting around the edge of the foreground doesn't look correct for the background.

### Simulates light 'glow'

If you've done much photography (and if you're reading this far you probably have), you've noticed that light coming from behind a subject will often 'wrap' around the subject giving it a faint glow. Additionally, light from a scene reflects off walls onto everything in the room.

The Light Wrap control panel is designed to simulate this type of light, producing a more convincing composite. It takes either Comp Shows Color or Comp Shows Layer, depending on which one you have selected, and uses that as the light color.

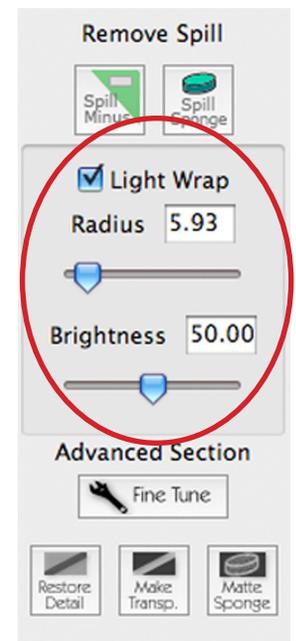
### Choose your background first

Important! You need to know what background you're going to be putting behind the subject. It won't do you any good to change the blue spill to red if you're going to put her in front of a waterfall!

If you don't know what background is going to be behind the subject, it's best to use the spill suppression tools (Spill Minus and Spill Sponge) to remove the blue tint altogether.

### Radius slider

This slider determines how far 'into' the image the light will wrap. The larger this is, the further away the light will spread from the edge of the subject towards its center.



## Example of wrap degree

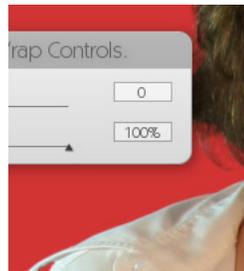
Take a look at an example on a sphere (at right). The effect is similar on more complex subjects, like our model below.



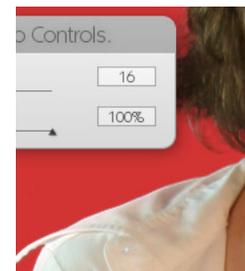
You can see that where Radius is set to 0, there is a noticeable blue tinge to the subject's shirt. This doesn't really match up well with the red background. When you look at it, it looks a bit off, but you might not be able to put your finger on what's wrong.

That is, until you turn up the radius on Light Wrap. With Radius set to 16, the blue tint turns to a reddish color, making it look like the shirt is reflecting the background. Now our model blends in much better with the background.

Original photo has color spill issues.



Radius of 0 does not eliminate the color spill.



Radius of 16 blends the color tint with background.



## Don't overdo Radius

You want to be careful not to overdo Radius, though. You can really crank the radius up and get some odd results. We can give our model an evil red glow if we want...

If you're making devil girls, this might be a great effect. For most images, this is a bit too much.

## Brightness slider

This parameter controls how intense the Light Wrap's light is. You might want to have the light just barely affect the subject. To make that adjustment, you'll need to fiddle with the Brightness value.



Radius of 89 gives too much correction.



## Advanced Detail Tools

There are four Advanced Detail tools. They are best used for small incremental changes or working on small areas of an image. They cover a small threshold of tonal values, in order to make fine adjustments. You can gradually remove or recover the spill intensity on the foreground object by sampling the color region repeatedly.

### Make Transparent tool

Make Transparent makes a selected color region more transparent or translucent. Use Make Transparent if in the editing process, you have darkened a transparent area, and want to make it transparent again. Make Transparent is a one-step operation, so clicking a second time will overwrite the effects of the first click.

For instance, if a shadow brought over from the foreground is too dark compared to the shadows in the background, the Make Transparent tool can lighten it up. This operation is also useful for the subtle tuning of foreground objects which are otherwise covered with smoke or clouds.

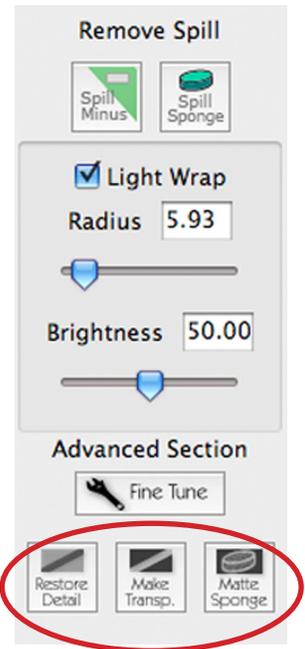
**WORK TIP** Moving the Fine Tune tool's [Transparency slider](#) to the right will also solve this problem.

### Restore Detail tool

This tool restores small lost details such as thin wisps of hair or smoke. Restore Detail is a single-click operation. Additional clicks will have no effect on the color spill, in that a second click will overwrite the effects of the first click, and so on.

Restore Detail is like a large semi-opaque brush, for which the completely transparent Background region sampled becomes translucent o a preset amount. Let's say you click on a range of colors, go too far with an adjustment, and totally wipe out some details. Restore Detail may bring them back without wiping out details that you want to retain.

**WORK TIP** Moving the Fine Tune tool's [Restore Detail slider](#) to the right is an alternative to using Restore Detail, and generally gives even finer control.



### Matte Sponge tool

This tool is used for removing small transparent areas in the final composite. It brings the sampled color to 100% foreground, essentially, a one-click 'make opaque' button.

We recommend it when you think you have a good composite after spill removal, but need to get rid of a few stray transparent pixels. A great aspect of Matte Sponge is that all of the spill-suppression information will remain intact. If the sampled color is already keyed out and removed, Matte Sponge leaves that color suppressed.

Sometimes in the masking process, for instance, a 100% foreground area will become slightly transparent when removing spill. You can clean up those transparent areas by using the Matte Sponge button. Find those transparent pixels in Mask View. Click once with the Matte Sponge on the dark transparent pixels and they will become 100% foreground.

**WORK TIP** The Matte Plus tool will also work to solve this problem, or moving the Tune tool's Transparency slider to the left.

## Fine Tune Tool

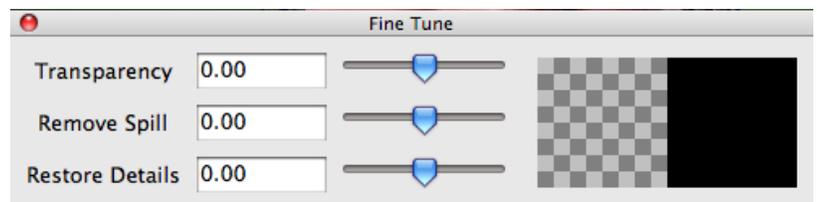
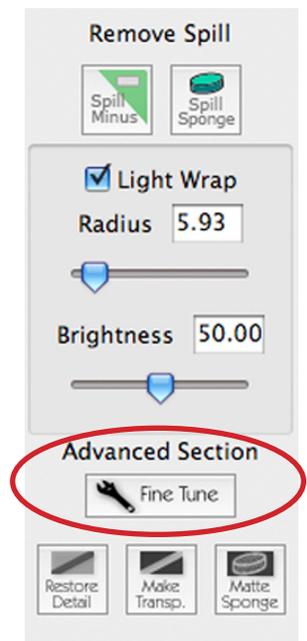
If spill color is not effectively removed using the Spill Sponge procedure, or if another spill correction made too much of a change, you can try a fine-tuning operation. The Tune Controls are used for a more problematic matte and are best for adjusting large areas, making sweeping yet subtle changes.

### How Fine Tune works

The Fine Tune button opens up a Tune Controls dialog box with three fine-tuning sliders. They are Remove Spill, Transparency, and Restore Detail. There is also a Color Chip to sample with. You will probably use the Remove Spill and Transparency sliders more than Restore Detail.

To perform the tuning operation, do this:

1. Open the Fine Tune dialog by clicking the Fine Tune button.
2. Click in Primatte's Preview Window to sample a color region that has unwanted color tinge. You will see that color previewed in the Color Chip.
3. With the Color Chip loaded, you can choose any Tune slider to work with. Of course, you should know which one you're intending to use, but the point here is that it's active for any of the controls.
4. Drag a slider to affect the spill in the sampled region, and any tone that is similar throughout the foreground image. When you pull a slider, the percentage that you are correcting to will appear in the numeric box briefly, showing you the percentage of correction. The number resets to 0% once you let go of the slider, which is an unexpected but built-in behavior of the tool.
5. You will see a checkerboard grid in the Color Chip. Those checkers represent the transparency level of the sampled area of your photograph.
6. If desired, in your Preview Window, you can zoom into a problem area with the Zoom and Pan tools.
7. Continue this process of click-drag-slide until you reach a point of diminishing return.



### Remove Spill slider

After clicking the Tune tool and selecting a color region, this slider is used to remove spill from the registered color region.

The more to the right the slider moves, the more spill will be removed. The more to the left the slider moves, the closer the color component of the selected region will be to the color in the original foreground image. If moving the slider all the way to the right does not remove all the spill, sample a different color region and try again. The result of moving the slider to the right can also be achieved with the Spill Minus tool.

If your foreground image changed color dramatically during the fine tuning process, you can recover the original color by selecting an area of the off-color foreground image and moving the Remove Spill slider slightly to the left. This may introduce blue spill back into that color region. Again, use the Tune option to suppress the blue, but make smaller adjustments this time.

Remove Spill can go to a certain point and then it stops working. For instance, if you move the slider to the left to negate what you've removed, you'll add back in the tinge color until it's all added back in. You can't add in more than what the image started with.

**SUMMARY** Go right to remove spill color. Go left to add the spill color back in.

### Transparency slider

This slider can be used to make the matte more translucent in the registered color region. The result of moving the slider to the right can also be achieved with the Matte Minus mode.

Moving this slider to the right makes the registered color region more transparent. Moving the slider to the left makes the matte more opaque. If moving the slider all the way to the right does not make the color region translucent enough, re-sample the color region and again move the slider to the right.

**WORK TIP** You only want to use the Transparency slider on areas that are supposed to be transparent. Don't use Transparency on opaque areas that you want to lighten up. In fact, this rule is true of all transparency tools in Primatte.

**SUMMARY** Go left to make opaque. Go right to make more transparent.

### Restore Detail slider

This slider can be used to restore lost detail. It is especially useful for restoring pixels that were lost because they were so similar to the background color. The result of moving the slider to the left can also be achieved with the Detail Minus tool.

After clicking the Tune tool and selecting a color region, moving this slider to the left makes the registered color region more visible. Moving the slider to the right makes the color region less visible. If moving the slider all the way to the right does not make the color region visible enough, re-sample the color region and again move the slider to the left.

**SUMMARY** Go left to remove detail. Go right to add back detail.

### Color Chip

The Color Chip will change as you select different colors in the image. This color chip represents the tonal value (that is, tone of a color) that you have click-selected in the Image Window.

When you choose a Tune control to work with, this color sample is the value that the slider works from. The Color Chip will update as you adjust the slider.

The Color Chip is available at any time for any of the Tune sliders. You do not pre-select which Tune Control you will operate before loading the Color Chip.

After loading a color into the Chip well, you can then choose any of the three Tune Controls to use. You can change sliders while using the same loaded color; or, you can load in a new color, then switch to a different slider.

### Example of Fine Tune correction

Here is a great example of using the Fine Tune controls. In the case of our blonde model, we want to get rid of the excess green spill around his problematic flyaway hair. This green is left over from a Spill Sponge correction.

#### Spill Problem

This model was shot against a green backdrop. Notice the green tinge at the edges of the hair.



#### Sample Click

Open up the Fine Tune dialog, then click a tone that seems to represent the spill problem globally. Remember, you are not working on a particular physical location of an image. You are working with a designated range of color tone. The Color Chip will reflect the color that you have sampled.

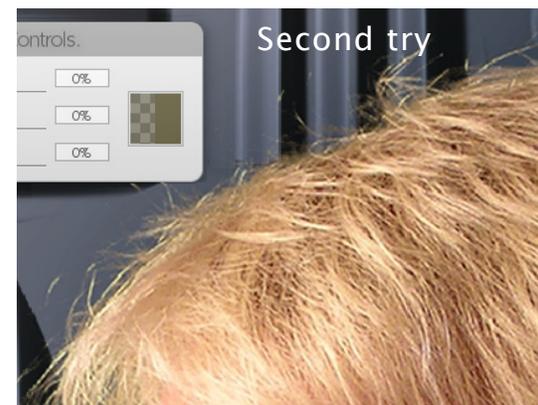
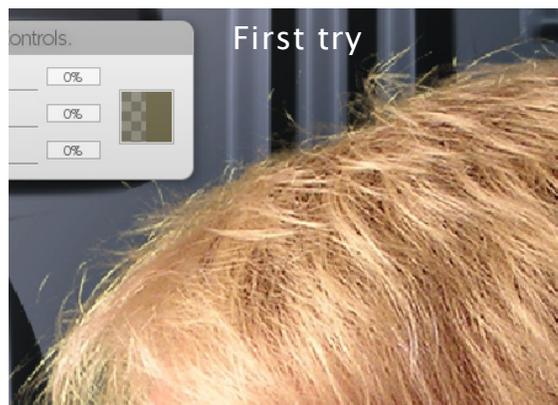


#### Slide Once

The results of one pull of the Remove Spill slider to the right at 15%.

#### Slide Twice

The results of two more right-slides, each time to about 10%. Instead of making one massive correction of 35% to the right, we've done the correction incrementally. This way, we can be watchful that the good areas stay corrected.

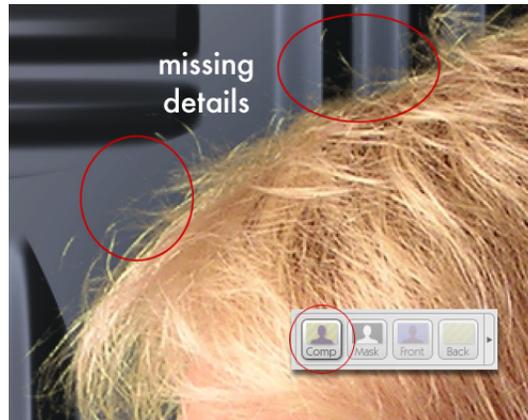


### Example of Fine Tune over-correction

You always need to be careful of over-correcting the bluespill. In the example below, we've used the Remove Spill Control incorrectly by trying to retrieve lost hair strands.

#### Spill Problem

To begin with, we've toggled our view of the composite between Comp and Full view. This is a good way to see what detail is missing. Note that some strands of hair are clipped out by the mask (left), like the areas circled in the Full view (right).



#### Slide Once

We want to retrieve the lost blond hair using a particular hair color as the sample point. Open the Tune dialog, click on the sample strand, and pull Remove Spill to the right. This reddens alike tones throughout the image (adds in the complementary color), which looks unnatural and bring back the hair color.



#### Slide Twice

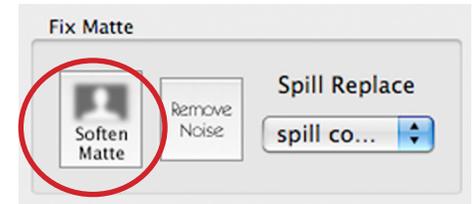
In fact, if we keep clicking the Remove Spill slider without sampling again, Primatte continues to subtract the key color, and add in its complementary. We get horrible banding and clumping.



## Fix Matte Tools

The Fix Matte tools are designed as ‘after process’ features that get rid of artifacts and aliased edges on an otherwise good mask.

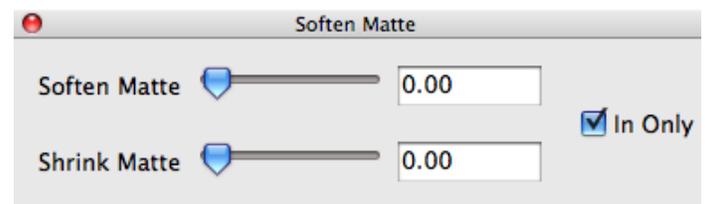
Artifacts are any feature which appears in an image that is not present in the original imaged object, like pixels that become discolored or too bright, which may happen if you overcorrect the bluespill in your mask.



## Soften Matte tool

When you click the Soften Matte button, a dialog box opens. Inside are two sliders and a checkbox.

You can use its two sliders, Soften Matte and Shrink Matte, to give the mask a softer edge. This will soften up any hard, aliased edges. Use them if more refinement is needed after doing the other spill removal and suppression tasks.



## Soften Matte slider

Soften Matte is similar to running a Gaussian Blur on the mask. The slider is good for getting rid of sharp edges. It is uncommon to use more than 5–6% blur radius because the edge will become too soft at higher values.

## Shrink Matte slider

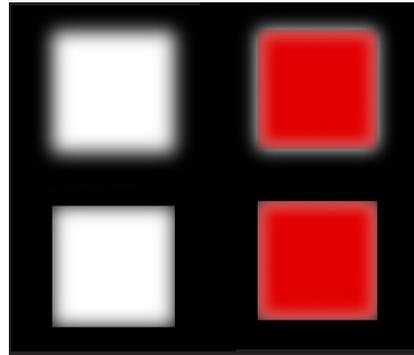
Shrink Matte will contract the mask without shrinking the blur. It doesn't shrink the mask so much as clamp the blur after applying. In most masks you won't use more than a 5% blur because the edge will become too soft at higher values.

## In Only checkbox

In Only locks the transparency on the outside of the mask. This causes the Soften/Shrink blur to avoid getting a halo effect. In Only is turned on (checked) by default.

Usually if you soften the Primatte mask, it softens in both directions. For example, if you had a white square on black and you applied a blur to it, the blur would extend off in both directions, outside the original square as well as inside it. This ‘expands’ the edge of the square. Instead of a solid transition from black to white, there is a soft edge that transitions from black to white over a larger distance. In Primatte, this can create a halo. With In Only, we lock the transparency on the outside or ‘black’ area of the matte and only soften the white area of the mask.

For example, let's say our white square is created with a selection. A square selection is made, then filled with white. If we apply a blur with the selection still active, only the area inside the selection will get blurred. This gives us a softer edge, but the edge of the matte is still the original edge. It's not 'expanded' by the softening. This prevents the halo from happening, as in our red square example.



Our white square has a blur that extends both inside and outside the original square. The red square has a blur that expands its edge and gets an unwanted halo effect.



Soften Matte slider at 0.



Soften Matte slider at 20. The hair edge is feathered.



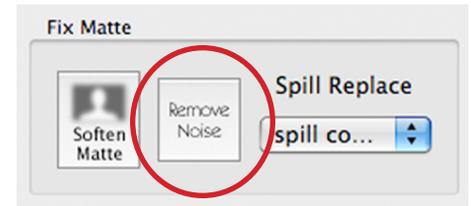
Soften Matte slider at 20, In Only turned on. The blurring is limited to the outside edge.



Soften Matte slider at 20, Shrink Matte at 20, In Only turned on. The blur is clamped.

## Remove Noise tool

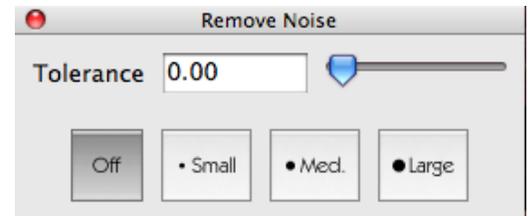
Remove Noise is helpful when there is a lot of noise in the foreground image that makes producing a good mask difficult. The Remove Noise tool has two controls to reduce the noise grain.



## When to use it

'Noise' is a grain that appears in images, typically when the subject is shot in low light or at high ISO speeds or if there are compression artifacts.

Remove Noise is used in situations in which you have a noisy source image. For instance, when your subject was shot without enough light or was accidentally shot with a high ISO. Since photography is generally well lit, this situation will probably not happen much and most likely, you will not use Remove Noise very often.



When you do use Remove Noise, you want to find the sweet spot of correction. The tool should clean up the background but still preserve the fine edges of the subject.

## How to use it

This tool directly affects the mask – not the source image after the mask is applied – so it is best used during the masking process when you use the [3-Step Mask tools](#). Let's say that you sample a background color with the Select tool and the initial mask has a lot of white noise in the background. Before using the Clean BG tool to solidify the background, see if Remove Noise can do an initial cleanup.

Unlike traditional noise removal plugins, this is not designed to remove noise from the entire image. It is only designed to remove noise as it affects the mask, allowing you to get a cleaner mask than would otherwise be possible.

Be careful not to overcorrect. Too much 'clean background' sampling to reduce the noise will adversely affect the edges and lose detail.

## Tolerance slider

Tolerance sets how much Remove Noise affects the image. Value range is 0 to 100%. The default value is 0, which means Remove Noise is turned off. At 100, there is a full effect and all noise grain is removed.

The grain tolerance is very sensitive and so you should try to use small values, like 5–20%. High values will remove more grain than there really is and eat into the image. When Tolerance is set very high, the image may literally disappear.

## Off, Small, Medium, Large buttons

When the Off button is selected, Remove Noise is effectively turned off. The other three buttons correspond to three grain sizes: Small grain, Medium grain and Large grain.

The larger the grain size, the larger the resulting reduction in grain. However, if the grain size chosen is too large, the result may be a loss of edge and foreground areas.



Our original photo was accidentally shot in low light.



The initial Primatte mask after the Select tool is used.



Tolerance at 20% removes the background noise (we like to call it 'schmutz') but keeps edge detail.



Tolerance at 30% removes too much of the foreground subject. We only want to correct the background.

## Spill Replace popup

The Spill Replace options control what color gets added to replace color spill. Each Spill Replace mode recognizes spill in a different way, which in turn affects the way Primatte's tools behave.

### Spill Complement

By default, Spill Complement is selected. This option adds the complementary color to the spill color to remove small amounts of spill. For instance, to reduce green spill, this option adds in red.

If foreground spill is mild or at least not a major problem, Complement is the mode to use. In fact, you will keep this mode selected for almost all of the images that you treat. This mode maintains fine foreground detail and delivers the best quality results.

### Spill Solid

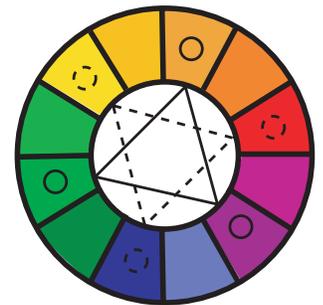
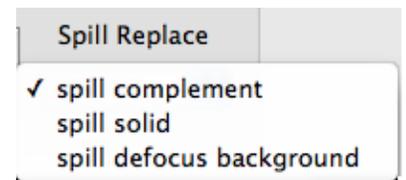
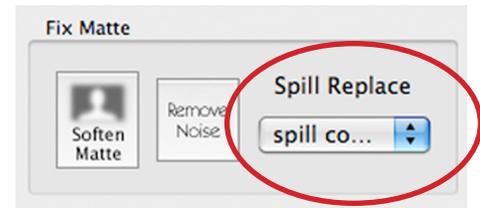
Spill Solid adds in a user-defined color to remove color spill. You choose this color through the Color Picker, which is the color well between the [Comp Shows buttons](#).

By doing so, you can bring in a color that suites your needs. Perhaps this color matches the composited background image. Alternately, you can choose a color that is prominent in the foreground subject in order to bring back lost details. For instance, if the subject is wearing a yellow shirt, then perhaps adding yellow will help your image.

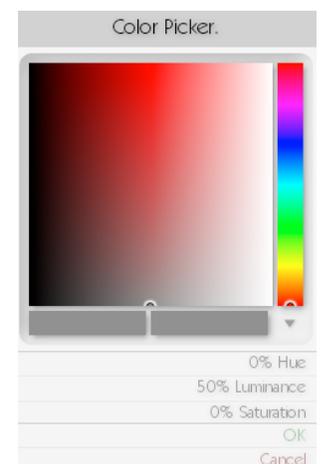
Use Spill Solid under serious color spill conditions, when the default Spill Complement mode don't solve the issue. The downside to Solid Spill is that fine details tend to be lost or slightly distorted, especially in high contrast areas.

### Spill Defocus Background

Spill Defocus Background samples color from a slightly blurred version of the image's original background. Like the Light Wrap tool, this option uses a background layer even if you render out to a transparent layer in Photoshop.



Spill Complement adds the color opposite (180 degrees across) on the color wheel.



Spill Solid uses the Color Well located in the Comp Shows color well.

### Example of Spill Replace options

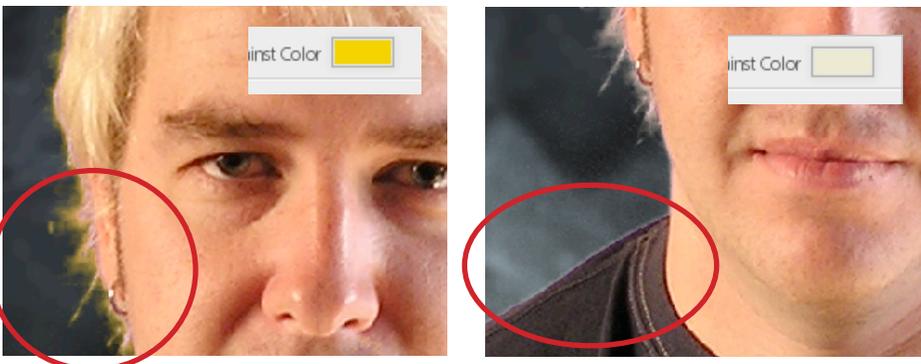
Here are some examples of using the Spill Replace options.



The original image (left) and with a key pulled (middle, right). Pinkish blue spill remains along the model's blond hair. Spill Replace is set to the default Spill Complement option.



The Color Picker changes the color well to beige, a color that fits the model's blond hair (left). With the Spill Solid option, the pinkish color spill is minimized, though not completely eliminated. Hair details are slightly exaggerated due to the addition of a beige fringe tone.



Problems can arise when using Spill Solid. A poor choice of color may add unwanted artifacts to a Foreground object, like the yellow tinge on our model's hair (left). Since a new color is added to all similar tones, an unnatural fringe can surround the object, as has happened along this model's shirt (right).

## Overview of chromakey

The process that Primatte performs is called ‘chromakeying’. Chromakey is the process of eliminating a single color from an image for the purpose of inserting a new background into that image. When you watch a movie or look at a photograph that has an unreal mix of images, you are usually looking at the illusion of chromakey.

### How it works

To prepare for creating a chromakey, the principal subject is photographed against a background of a bright single color or a relatively narrow range of colors, usually blue or green. A digital tool is used to extract the background color by making it transparent. Chromakeying, therefore, allows a false background (such as a weather map or scenic view) to be inserted behind and around the subject.

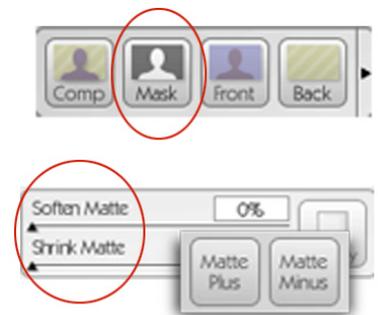
Throughout this manual, we will refer to ‘keying’ or ‘pulling a key’, meaning the operation that selects a body of color for removal from an image.

### So many terms!

The chromakey process is also called ‘blue-screening’ or ‘green-screening’, depending upon the color of the background you’ve placed behind your model.

When referring to the key created, the word ‘mask’ is used frequently and interchangeably. Mask is a term that refers to a location that’s been isolated in a digital image and is commonly used in graphic design and digital photography.

Some Primatte tools also make use of the term ‘matte’, which is a term used often in video and compositing work. Matte usually refers to a mask that moves across the screen, outlining a person walking across screen, for instance, or a trail of smoke created by special effects software.



### What is a mask?

A common definition of a ‘mask’ is an area of an image that is protected or ‘masked’ from editing. Another commonality is that a mask controls how different areas within an image are hidden and revealed.

In a Primatte mask, both definitions hold true. The pixels in a mask are made transparent, effectively leaving only the object that you want to place into a new background.

The term ‘mask’ should be familiar, because Photoshop employs mask technology for

many of its functions. For instance, the Magic Wand, Lasso and Marquee tools all create a selection, which is really a mask that isolates part of an image as you apply filters or effects to the rest of it. Alpha Channels are masks that save these selections so they are permanent and reusable.

Still inside Photoshop proper, the Quick Mask mode lets you create and view a temporary mask for an image. A Layer Mask lets you obscure part or all of a layer or layer set. So does a Vector Mask, and between the two mask types, you can create soft and hard masking edges.

In Photoshop, masks are stored as 8-bit grayscale channels. Similarly, Primatte displays its mask as an 8-bit grayscale image.

### **Foreground & Background**

Another concept that you'll find in working with Primatte is the idea of 'foreground' and 'background'. Foreground refers to the object that is the chromakey subject; the person or object that is photographed against a single color screen. 'Foreground' also refers to the area of the Primatte mask that stays opaque, and thus, reveals the foreground subject. This portion of the mask can be represented with white pixels in the Primatte interface.

Background refers to the visual that will be composited behind and around the foreground object. This is typically an environment that would be difficult to photograph or film behind the subject, such as footage of a solar system or a Prehistoric scene that's built in a 3D application.

Background also refers to the area of the Primatte mask that becomes transparent, and thus, reveals the background environment. This portion of the mask is represented with black pixels in the Primatte interface.

### **Behind the scenes**

So what is actually happening inside Primatte when you tell it to separate the Foreground from Background? How does the plug-in determine where the mask edges should be? Where the blue screen ends and the object begins?

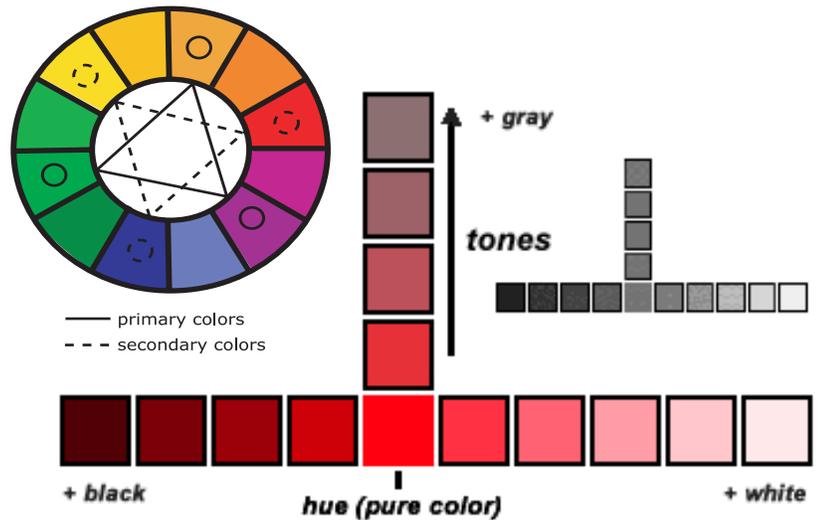
Primatte doesn't look at a particular area of the image, like a hand or an apple stem, that you have clicked on to sample. Instead, Primatte looks at a tone that you have clicked on, and finds a range of lightness relating to its color. Then Primatte finds that tone distributed throughout the entire image you've loaded in. The tool performs the correction it is built to do, like extracting a tone or eliminating a tone, on the entire image.

### **Looks at color tone**

A 'tone' is a value of light or dark that is independent of its hue. Tonal value dominates our visual experience, contributes significantly to our perception of the space, and is the most basic visual stimulus. Tone is actually quite important in visual art and color theory – but that's another manual.

**TECH NOTE:**

At the end of this manual you can read about the Polyhedral Slicing Algorithm, which is Primatte's proprietary operation that separates all of the pixels in your Foreground image by creating a 3D RGB color space.



A chart of tonal range for the color red and the color wheel. Complementary colors are found directly across from each other on the color wheel. Therefore, a complementary color to reddish skin is green.

**Choosing a screen color**

The main rule in using a chromakey tool is that the color used for the backing screen cannot be found in the foreground object.

If a person is wearing a blue shirt or has blue eyes and he is photographed against a blue backing screen, the shirt or the eyes will seem to disappear when the blue background is removed.

Whenever you see any special effects in movies where the actors are obviously shot against a computer generated background, you will notice they are NOT wearing either green or blue (which immediately tells you what screen color they were shot against).

**Use a blue screen**

Historically, blue is the most often used screen color. This is because blue is the complementary color to flesh tone. The most common color in chromakey situations are flesh tones, since people are most often the subject, so blue is the logical choice to avoid conflicts.



Two chromakey mistakes. **LEFT:** The white of the background screen is present throughout the vase's design and its natural highlights. **RIGHT:** The blue of the screen is found in the woman's blue jean jacket and blue eyes.

### Use a green screen

Green is also rarely found in skin tones, so it is the second choice when using people as the foreground object. There is usually no specific advantage to using blue over green or green over blue. We suggest performing tests to determine which color delivers the best results for their specific application.

### Problematic colors

White, black and gray are problematic backing screen colors because they are found in almost every foreground object. You will find white highlights, black shadows and black wrinkles as well as white teeth, white eyeballs and dark eyelashes.

Another color that is used, but you need to be careful of, is red. A red screen can get too tangled into the skin tones of human models. This is true for yellow and brown also. Blue and green are the best choices for photographing humans because these colors are least likely to be found in skin tones.



Red is a bad color choice when photographing people because it conflicts with reddish skin tone.

### Use saturated colors

A unique feature of Primatte is that it works equally well with almost any color of backing screen. Using a saturated color is best, however. For instance, a rich blue will always work better than light blue or turquoise. There are many screen products manufactured in the colors of 'ChromaKey Blue' and 'ChromaKey Green'.

### Lighting and staging

Lighting is very important in photography, and this is especially true for chromakey work. We strongly recommend that you do some research into how to light for chromakey. Here are some basic guidelines for lighting your photos.



From LEFT to RIGHT:  
Bad setup.  
Better setup.  
Good setup.

- 1- Make sure the screen is lit evenly across. Eliminate wrinkles and creases in the screen material, and be careful of very bright or dark areas from your light setup.
- 2- Be careful that your model is not casting shadows on the screen. The subject should be 8-10 feet in front of the screen (10 feet is recommended)
- 3- Light your model separately from the screen.
- 4- Set up two lights, one from each side, both a good distance from the screen. This will avoid getting a bright 'hot' spot in the center of the lit area.
- 5- Make certain that the model is fully framed by the chromakey material. This means that you need a screen that is wider and taller than your subject.
- 6- Depending upon your production, you may also want to extend the chromakey screen beneath your model. If you are substituting a custom floor graphic after using Primatte, then you should definitely do so.



Your goal is to have even lighting across the background screen, and to light your model separately.



Incorrect lighting can form hotspots and create excessive color spill.



## The Primatte algorithm

When discussing the Primatte tools and their operation throughout this manual, we have refrained from using words like ‘polyhedron’ and ‘bulging’ or ‘denting’ into sections. While we could find some very humorous ways to explain what these terms refer to... they REALLY indicate the way Primatte operates behind the scenes.

### It’s all about polyhedrons

How does Primatte work behind the scenes? Well, the heart of Primatte is its proprietary algorithm. To use Primatte most effectively, it helps to understand how this algorithm works. It is called the Polyhedral Slicing Algorithm, and it operates in 3D RGB Color Space. Huh?

Basically, Primatte separates all of the pixels in your Foreground image into one of four separate categories. It does this by creating a 3D RGB color space for the foreground image, and building three concentric polyhedrons, one within the other. These polyhedrons separate all the colors in the foreground image into one of four areas.

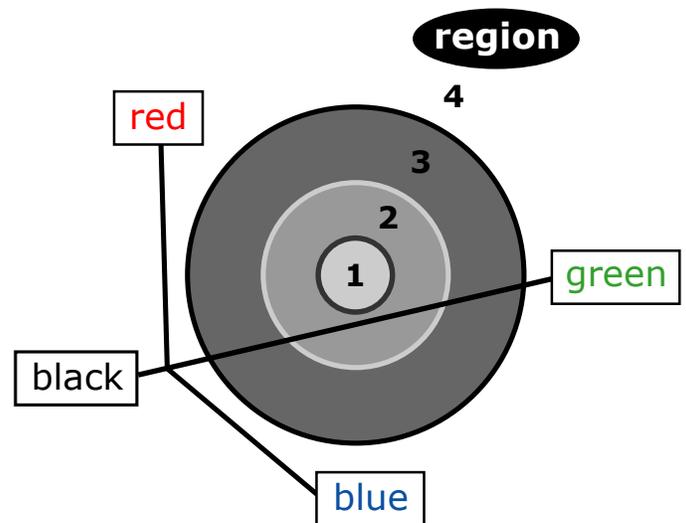
While we’ve depicted the polyhedrons as circular shapes in our diagram, in reality they are more like globes. Each globe is made up of 128 surfaces. These surfaces can be distorted into many different shapes to accommodate the color regions in each unique Foreground image.

### Four regions of color

Looking at the four regions that are created by these polyhedrons, we can see that each region has a particular property.

#### Region 1

This region is the small polyhedron. It contains all of the pixels in the foreground image that are designated as 100% background. This means the foreground colors in the small polyhedron will be replaced completely with background pixels.



The polyhedrons that form Primatte’s 3D RGB color space.

## Region 2

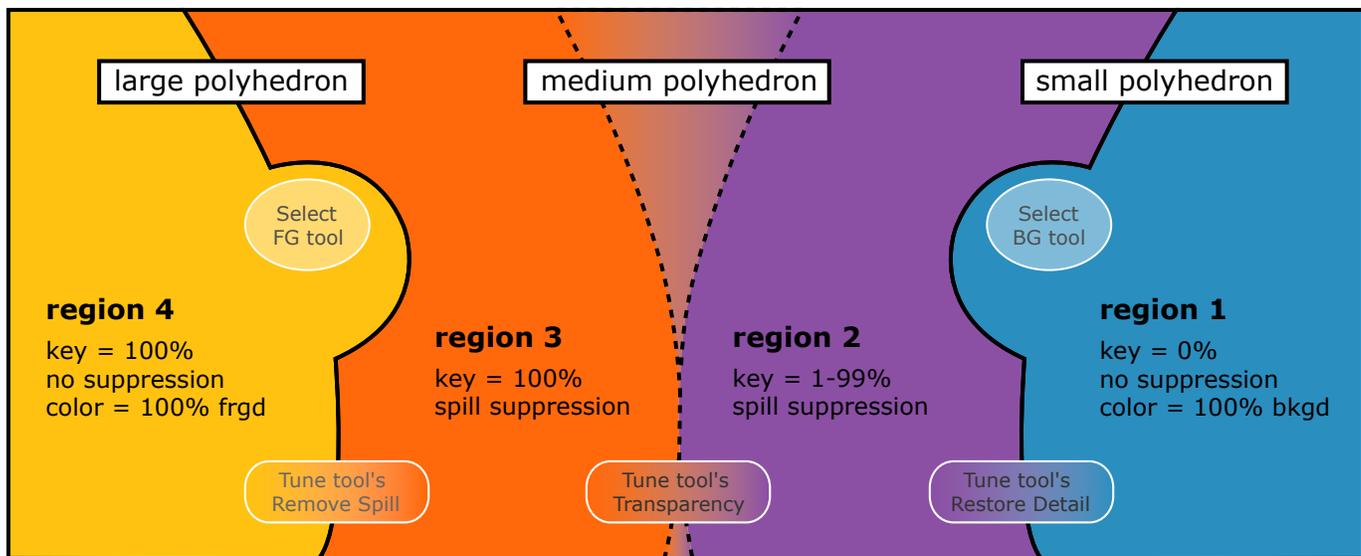
This is the region between the small polyhedron and the medium polyhedron. These foreground pixels are designated as the transition pixels between the foreground and the background. These pixels are where Primatte blends the original background pixels with the foreground. Foreground object edges, wisps of hair and smoke pixels are found in this region.

## Region 3

This region is between the medium and large polyhedrons. These pixels are 100% foreground, but have background 'spill suppression' applied to them. This category is for pixels at the center of the foreground object, where you want the bluespill suppressed but you don't want background pixels blended in.

## Region 4

This region is reserved for 100% foreground pixels that are unchanged from the original image. All the foreground colors that are outside the large polyhedron are exactly as they were in the original foreground image.



The four regions created by Primatte's polyhedrons.

### How does this relate to me?

All Primatte manipulations involve moving foreground pixels between these four categories. In reference to the Polyhedral Slicing Algorithm model, Bulge = add bluespill, Dent = remove bluespill. How do these polyhedrons relate to the tools you've learned in the rest of this manual? Following are some examples.

#### Example: Fine Tune sliders

When you are in the [Fine Tune tool](#), its Remove Spill, Transparency, and Restore Detail sliders do not increase the entire circumference of the polyhedron. Instead, they just bulge or dent it in the particular color region that you registered prior to moving the sliders.

All colors in the foreground image are forced into one of the four categories we've mentioned. You can look at the Tune Controls as Large, Middle and Small Poly sliders.

For instance, you select a bluish pixel and move the Fine Tune > Remove Spill (Large Poly) slider to the right. What you are doing is actually bulging the large polyhedron and moving the registered color region from Category #1 to Category #2. This will leave the color region as 100% foreground, but suppresses the blue or green tinge. It will affect all similar colors, or tonal values, in the Foreground image.

#### Example: Restore Detail tool

When you lose some smoke or hair detail, you can dent the small polyhedron using the [Restore Detail tool](#). These operations dent the small polyhedron in that area and releases the previously missing smoke or hair into the visible area between the small and medium polyhedron.

#### Example: Clean BG tool

When you are in [Clean BG mode](#), every time you designate a region of white noise, the small polyhedron enlarges slightly in that direction, encompasses those pixels, and makes them 100% background.

### Final thoughts

If you've read through this algorithm information and now have visions of overgrown polygons prancing obscenely through your head... don't worry about it. You can operate Primatte forever without understanding its technical backbone. This information is simply here for those inclined to learn it.