

Introduction	3
Introduction to Chroma Keying	4
<i>How Chroma Keying Works</i>	4
<i>Avoiding Common Problems</i>	5
<i>Tutorial: Chroma Keying in Veescop Live</i>	7
The Veescop Live Interface	16
<i>Inputs Tab View</i>	16
<i>Record/Display Tab View</i>	17
<i>Recording Sub Tab View</i>	17
<i>Video Display Sub Tab View</i>	18
<i>Audio Display Sub Tab View</i>	20
<i>Patterns Tab View</i>	20
<i>Zebras Sub Tab View</i>	20
<i>Chroma Key Sub View</i>	21
<i>Understanding the Chroma Key Parameters</i>	22
<i>Chroma Key Parameters Explained</i>	24
<i>Softlyght Tab View</i>	25
<i>De-spill Tab View</i>	26
<i>Smooth Tab View</i>	27
<i>Edges Tab View</i>	28
<i>Scopes Tab View</i>	29
<i>Overlay Tab View</i>	31
<i>Background Tab View</i>	31
Trouble Shooting Veescop Live	32

<i>The video preview window seems slow or jerky?</i>	32
<i>I don't see any video input buttons?</i>	32
<i>Why can't I hear the sound when I record with the iSight Camera?</i>	32

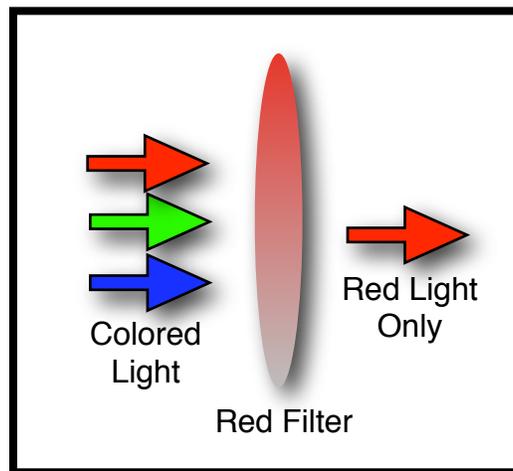
Introduction

Veescope Live is designed to provide visual feedback on a live video stream. These visual aids make it easier to make adjustments to a scene or video camera during a shoot. Veescope Live works with any Quicktime compatible video source.

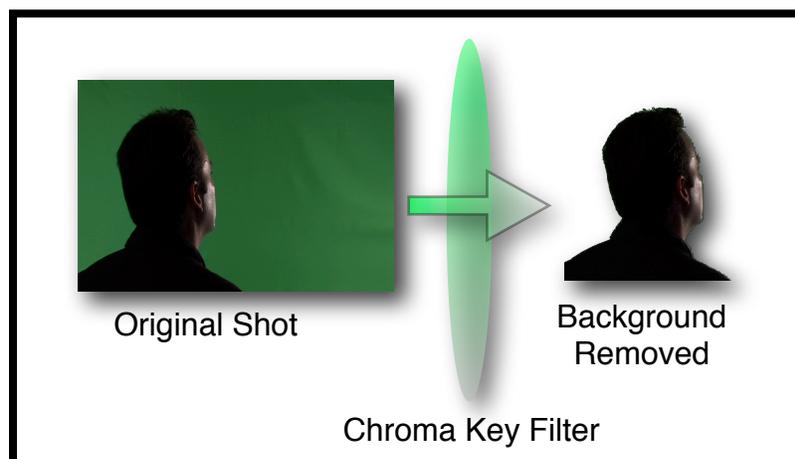
Introduction to Chroma Keying

How Chroma Keying Works

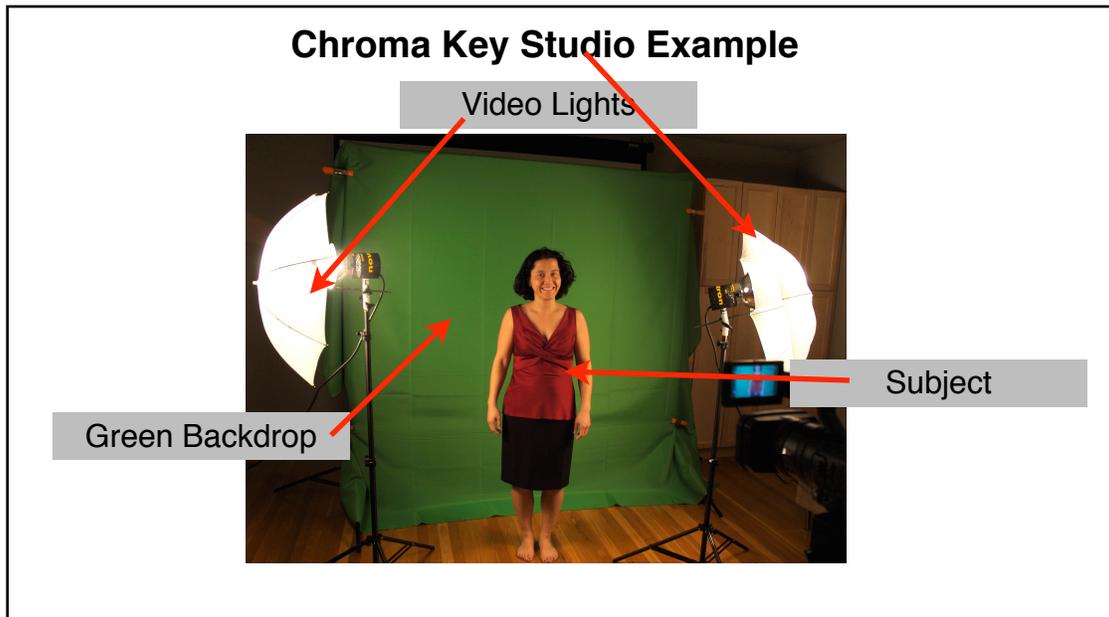
The process of Chroma Keying is very similar to placing a color filter in front of the lens of a camera. For instance, a red colored piece of glass will only allow red light to pass through. A green colored filter will only allow green light, and a blue colored filter will only allow blue light to pass through. In each case, some part of the image is blocked while the another part passes through.



With a Chroma Key, we want a certain color range to be eliminated from an image. The missing part can then be filled in by a different image. By doing this, we can make someone appear to be at a different location. For example, a person is standing in front of a green background, and by telling the Chroma Key-er to remove anything from the image that is same color as the backdrop, the background can be removed. A new background scene can now be swapped in behind the person.

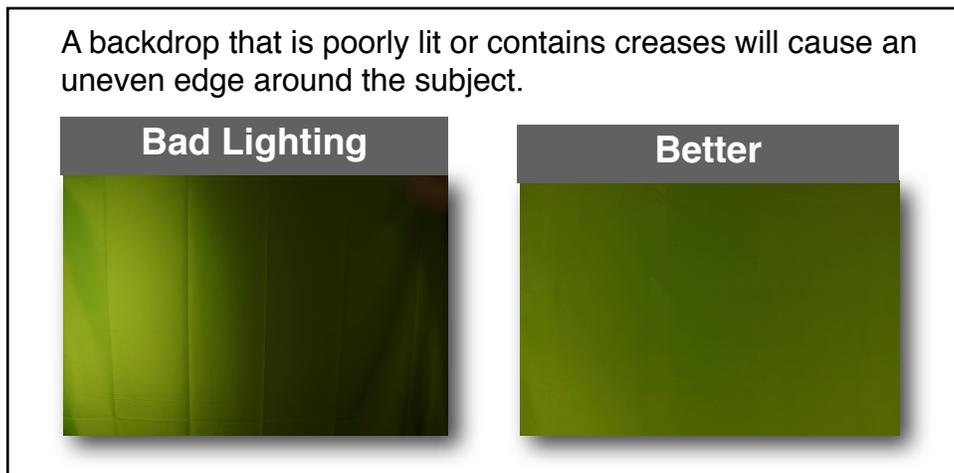


A basic chroma key setup consists of a colored cloth backdrop and a subject.



Avoiding Common Problems

Because Chroma Keying relies on extracting a color from the screen, the backdrop needs to be extremely uniform and consistent. Since a backdrop with shadows and creases will be very difficult to key, make sure the cloth backdrop is free of creases and wrinkles.



The subject and the background cannot contain similar colors. A person wearing a green shirt will disappear into a green background. Blue jeans do not chroma key well against a blue backdrop. In addition, blonde hair can be difficult to key against a green backdrop. Pay attention to the wardrobe and hair color of the subject when choosing a backdrop color.

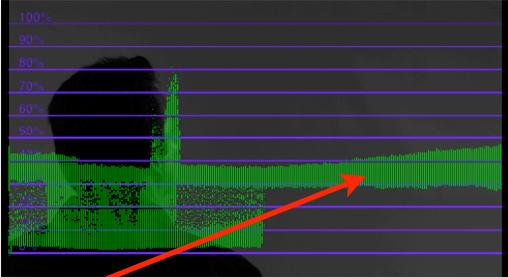
Since lighting affects both the foreground and background, it is much easier to light the two independently. The background should be close to 40% of the maximum brightness for the video camera. Making the background too bright will cause the color to become washed out or de-saturated. This will cause problems around the edges of the subject when the chroma key filter is applied.

Background video brightness should be close to 40% of the maximum for the camera

Original Shot

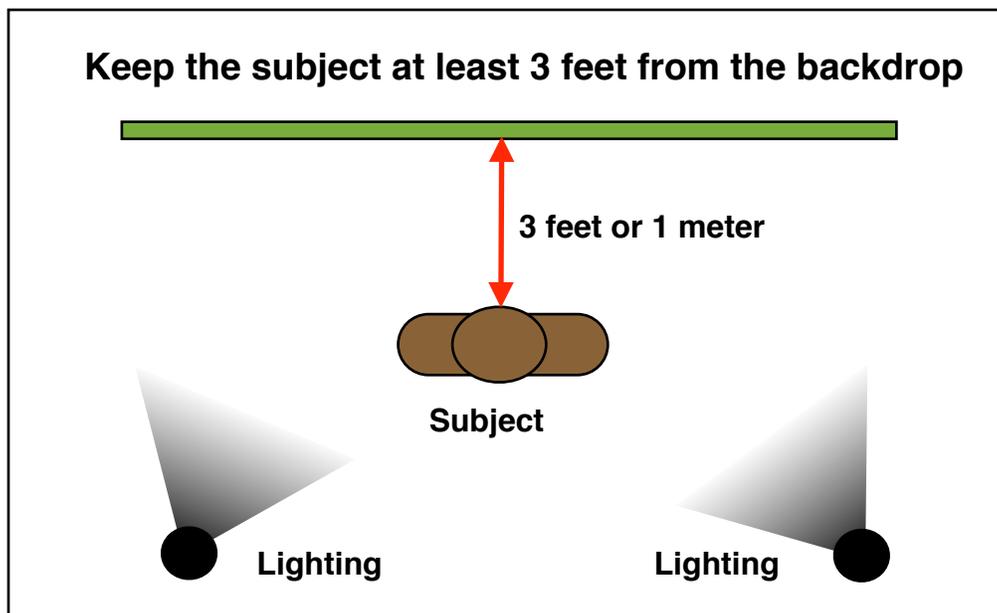


Waveform View



The brightness is displayed as a green plot from left to right. Here the backdrop is near the ideal brightness.

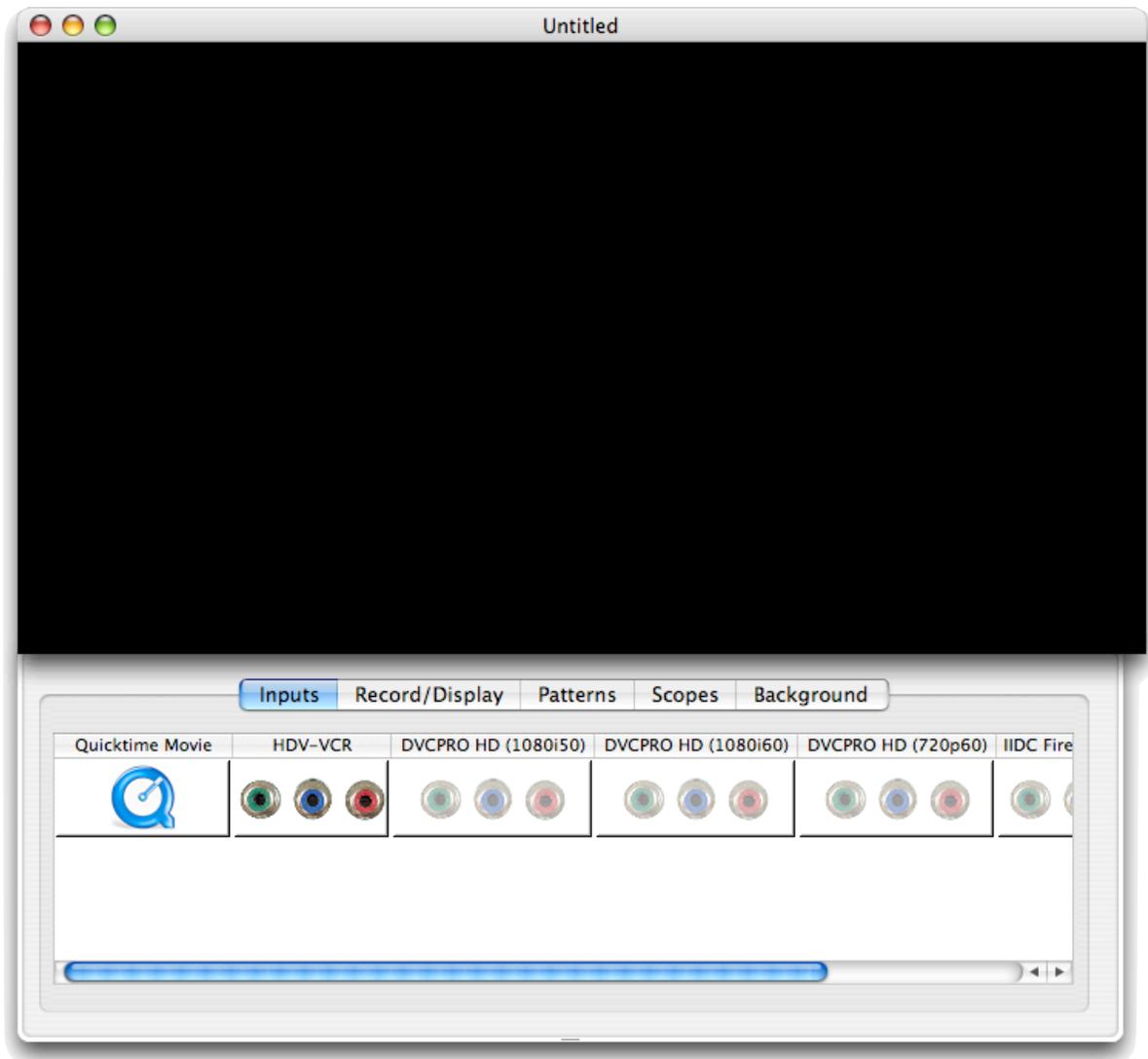
Keep the subject far enough away from the background to avoid casting shadows on the backdrop. Usually, three feet from the backdrop is recommended as the minimum distance.



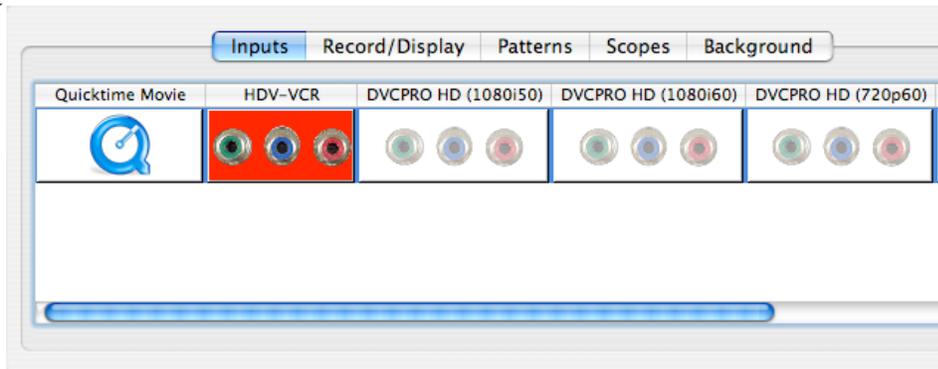
Tutorial: Chroma Keying in Veoscope Live

This tutorial will walk you through the process lighting a chroma key backdrop and previewing the Chroma Key in Veoscope Live. You will need a camera connected to your computer, a chroma key backdrop, and lighting in order to follow along.

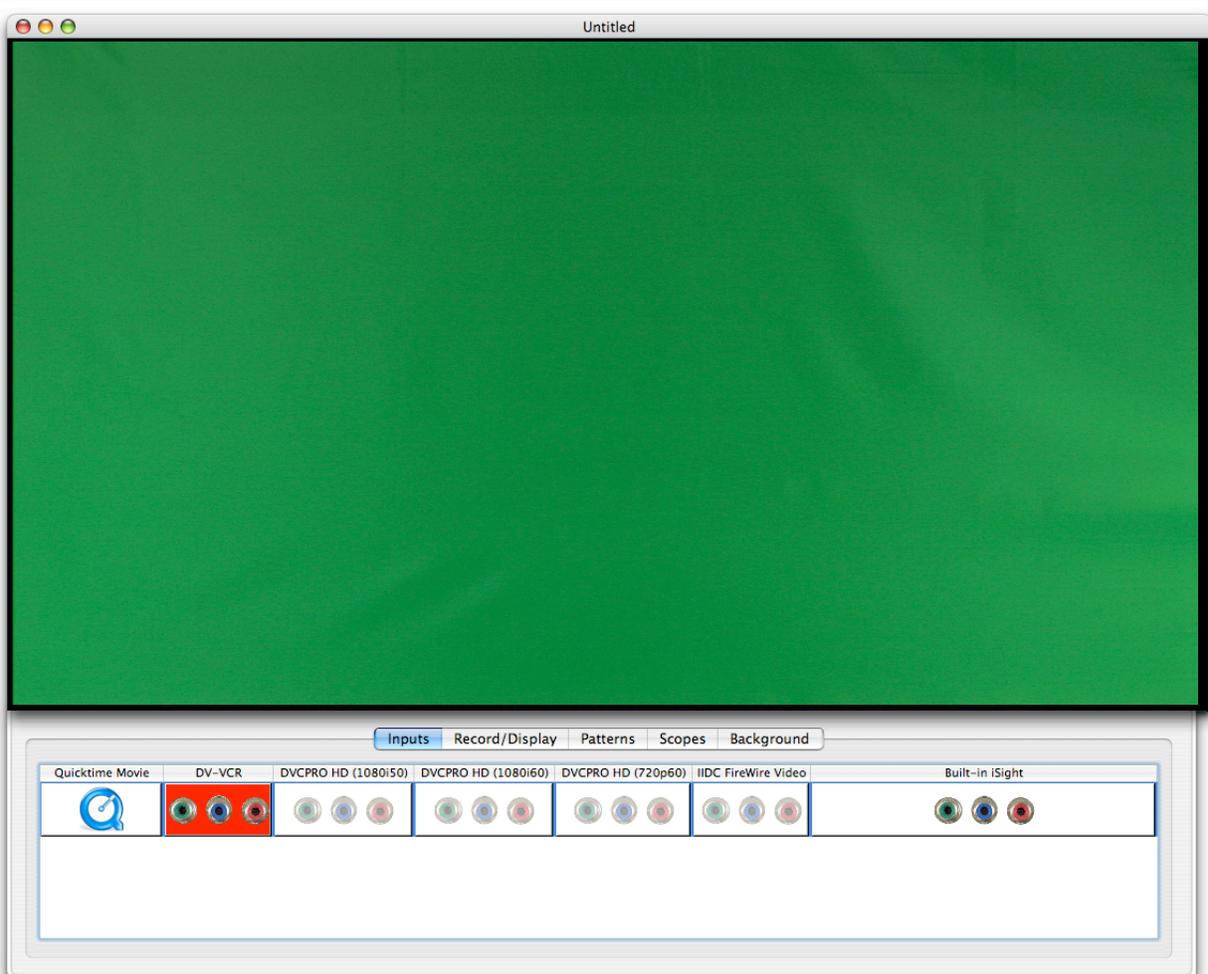
Start by having your camera enabled and connected to your computer. A DV camcorder connected via firewire will work well for this tutorial. Launch Veoscope Live.



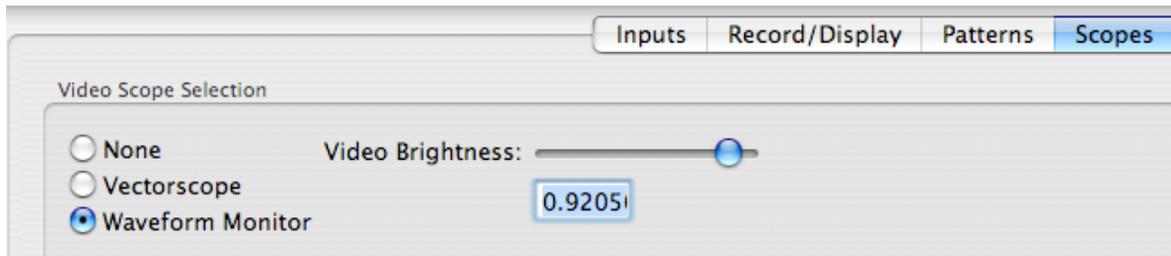
Select the camera from “Inputs” Tab View.



Focus the camera on the backdrop and zoom in until it fills the screen.

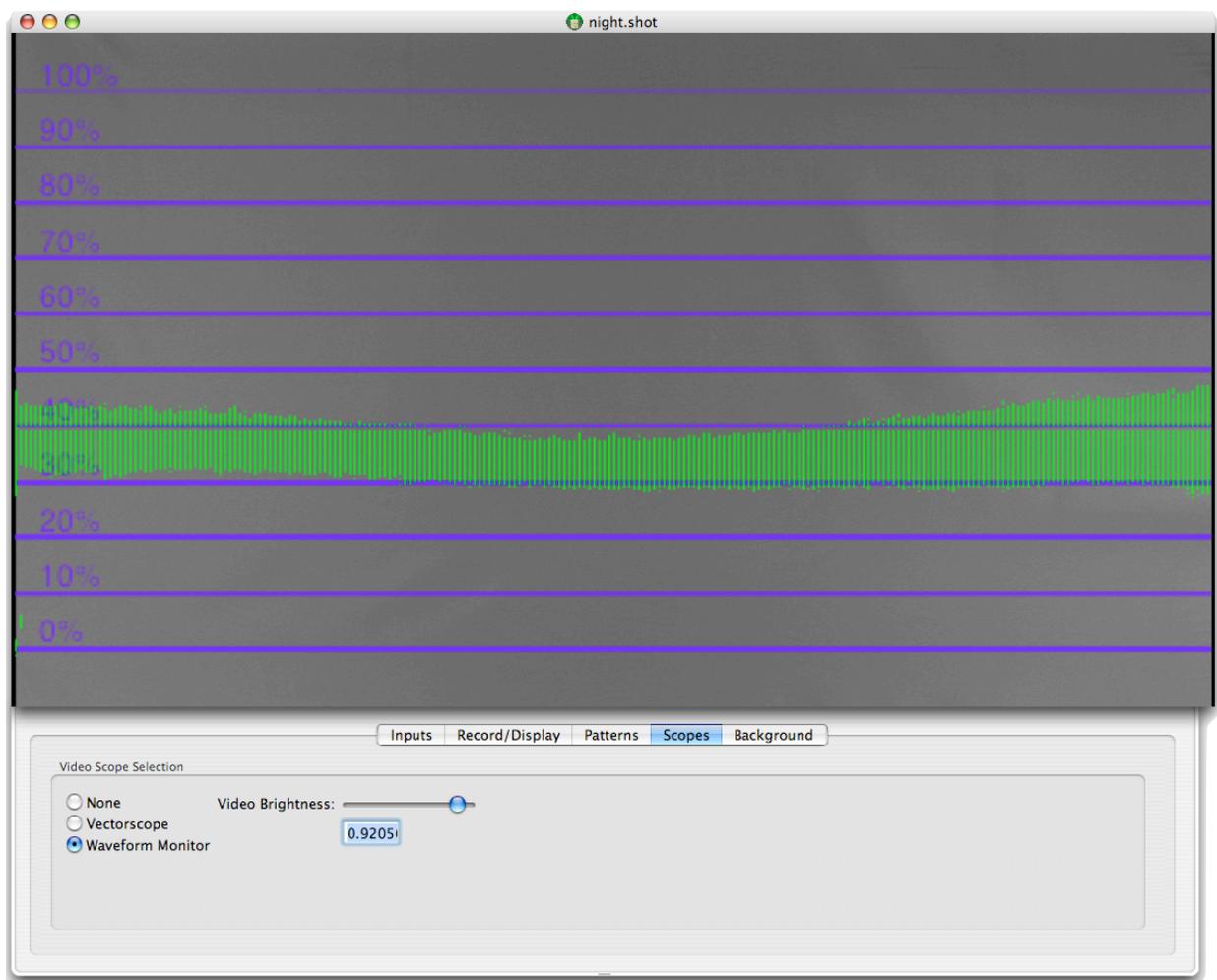


Select the “Scopes” Tab View and then enable the Waveform Monitor.

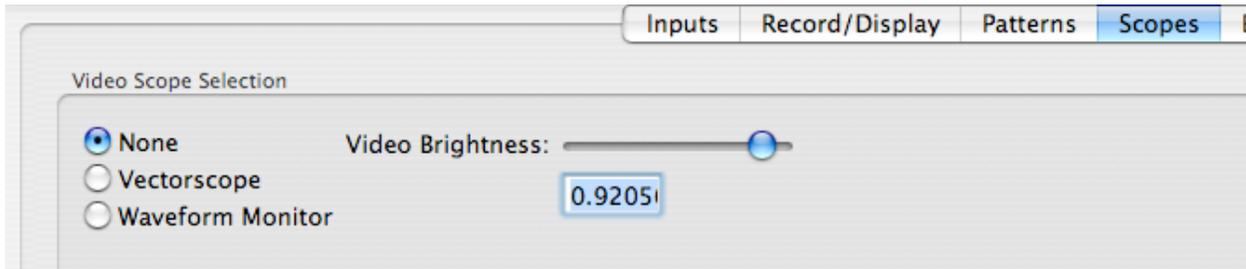


The Waveform displays the brightness of the video from left to right across the screen. You should see a green continuous line across the screen. The goal is to try to get the green line as thin, even, and straight as you possibly can. Moving the angle, intensity, and position of the lights can help smooth out the line. Any surface imperfection in the backdrop will also cause the line to widen.

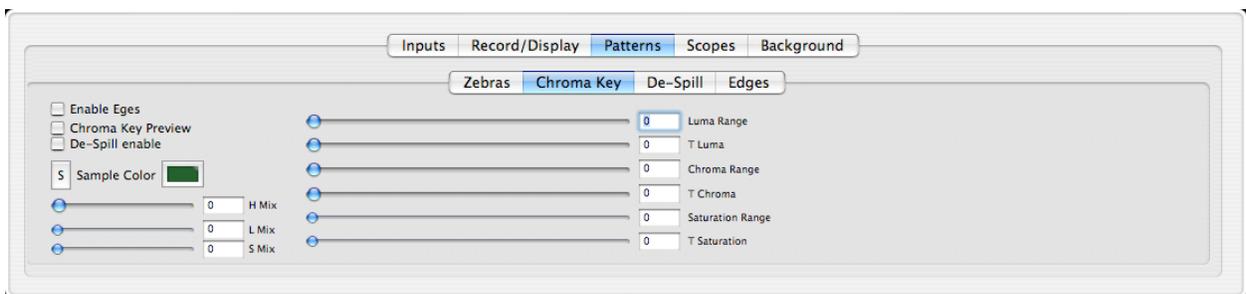
Try to keep all parts of the line between the 30% and 50% mark. If possible, try to keep the line centered at the 40% mark.



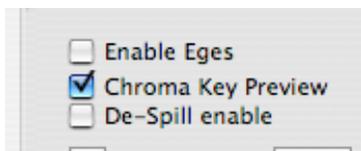
Select "None" to disable the Waveform monitor.



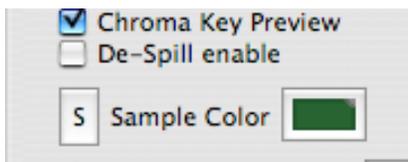
Place your subject in front of the backdrop and select the "Patterns" Tab View and then the "Chroma Key" Sub-Tab View.



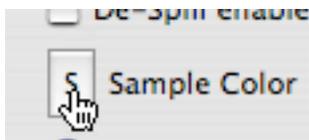
Click the check box to enable the "Chroma Key Preview".



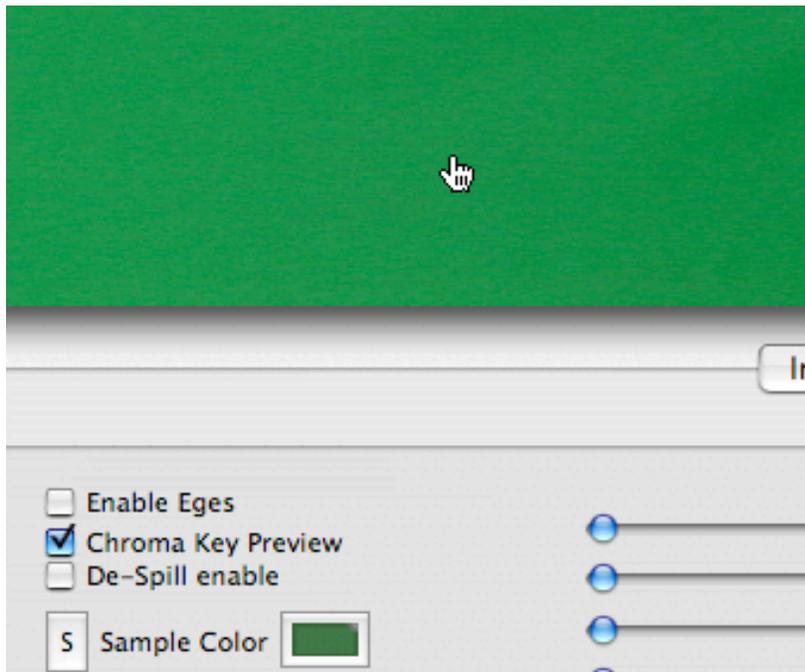
Click on the "Sample Color" button.



The pointer should change to a hand.



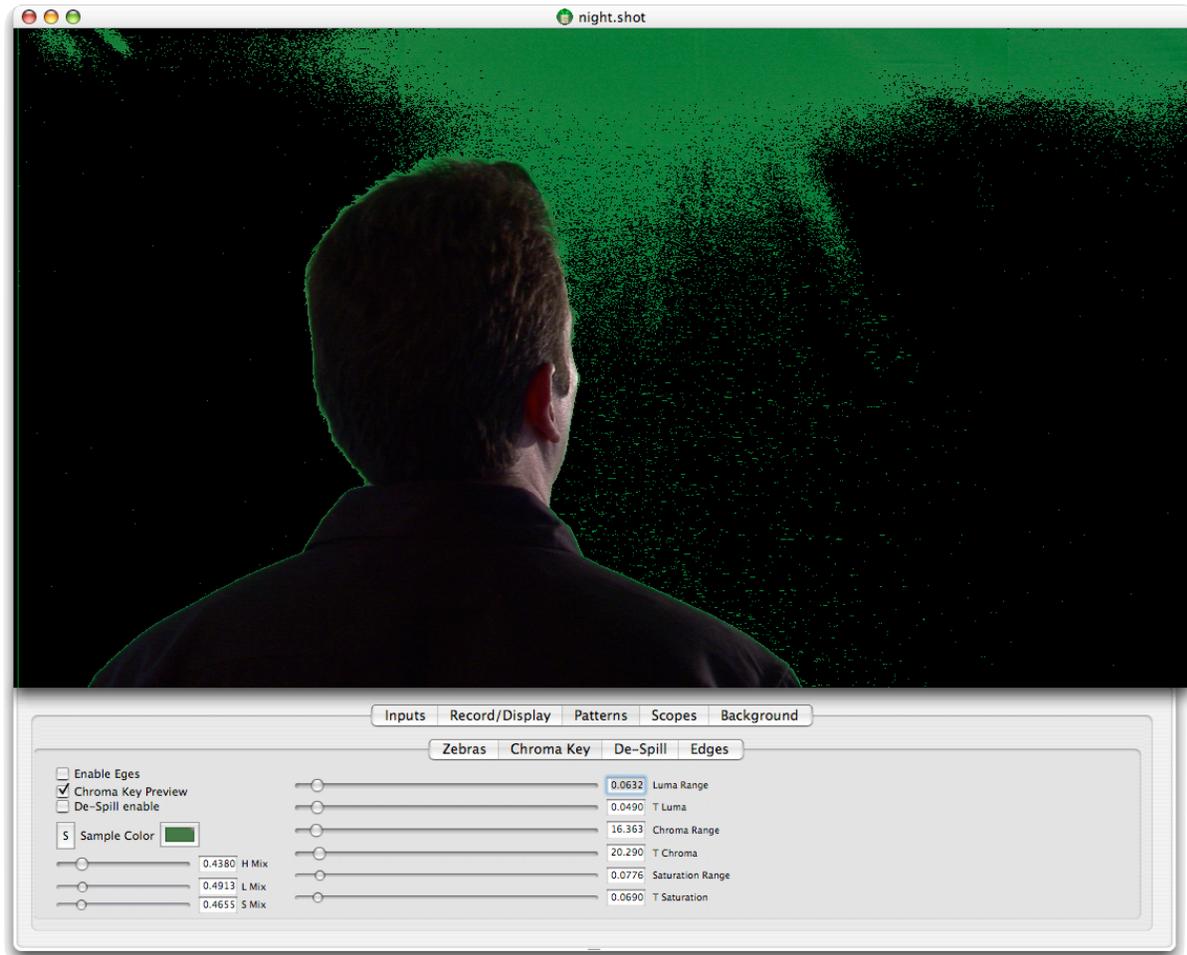
Select part of the backdrop in the video preview window.



Adjust each one of the sliders in this Tab View.

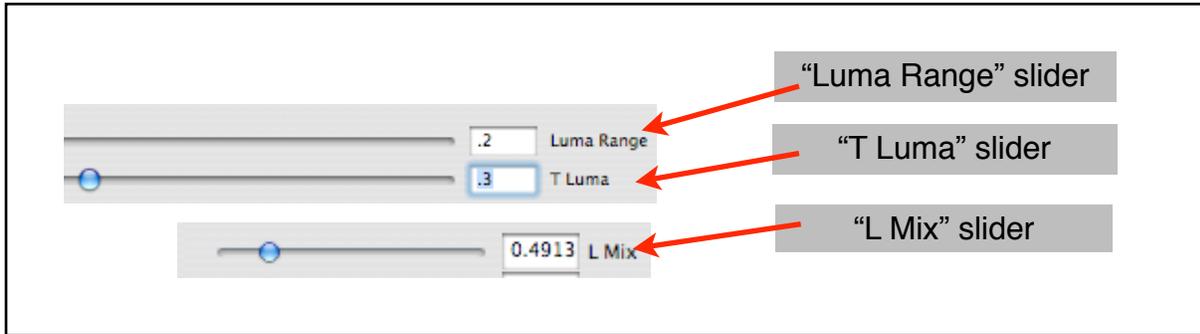


Once all the sliders are above zero, part or all of the backdrop should turn to black.

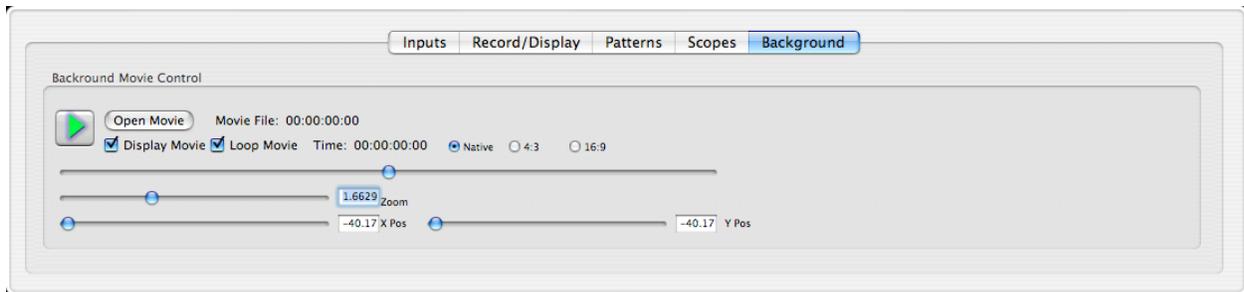


The sliders all adjust different parts of the same three basic color components, “Chroma” (chrominance or hue), “Saturation”, and “Luma” (luminance or brightness). The sliders labeled with the word “Range” create a sharp transition between the background and the subject. The sliders with the letter “T” (Transparency) create a more gradual transition between the subject and the background. The sliders with the word “Mix” determine the strength of each component to compute what to remove from the background.

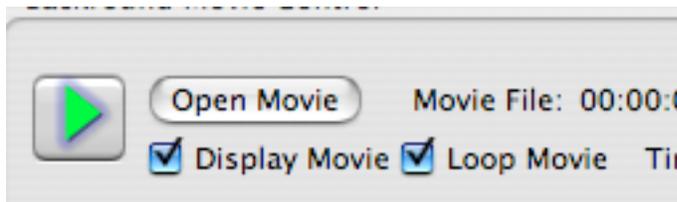
For instance, if the Luma Range slider is set to “0.2”, any color brighter or darker than 20% will be removed. If the “T Luma” slider is set to “0.3”, a gradual transition for colors that fall within that range will be created. The “Luma Mix” slider will set the strength of the brightness component relative to the chrominance and saturation components. The best way to figure out what these sliders do is to just experiment.



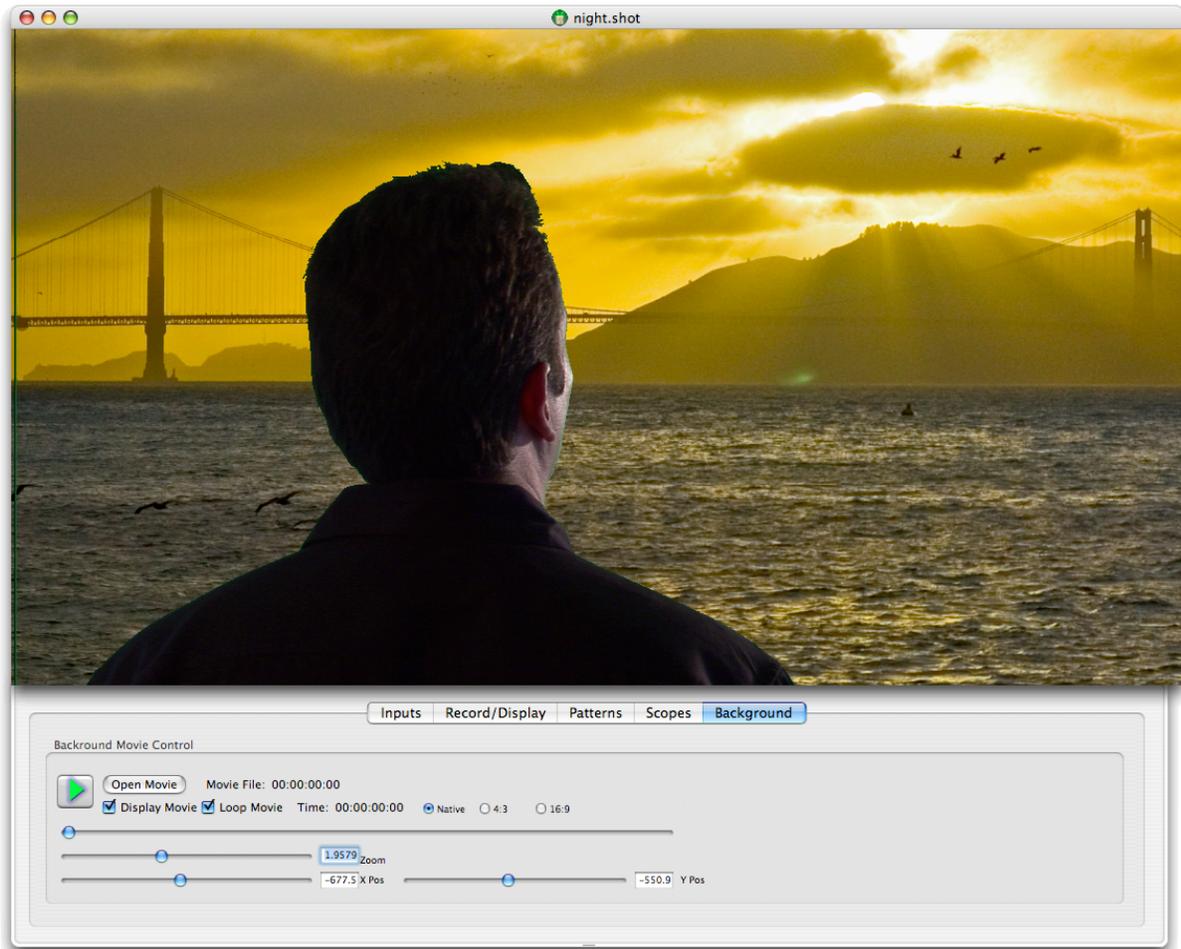
Select the “Background Tab”.



Press the “Open Movie” button and select a Quicktime compatible movie or still image to display in the background.

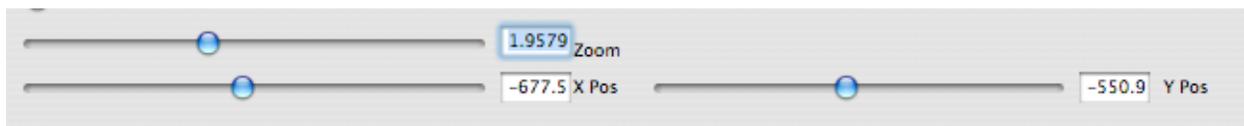


The background should be displayed behind the subject.

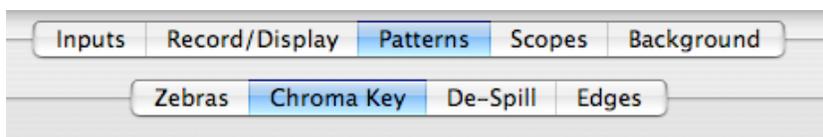


If using a still image, it must be in 16:9 or 4:3 aspect ratio with square pixels, such as 640x480, or 1920x1080. If the image is not in the correct aspect ratio, it will look scrambled. This is a limitation of the current version of Veoscope Live.

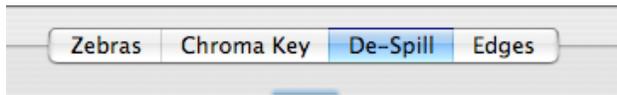
You can use the “Zoom”, “X Pos”, and “Y Pos” sliders to adjust the position the background relative to the subject.



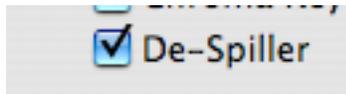
Select the “Patterns” Tab View to return to the “Chroma Key” Sub-tab View.



Click on the “De-Spill” Sub-tab View. This Sub-tab is used to neutralize any color that might be along the edges of the subject.



Click on the “De-Spiller” checkbox.



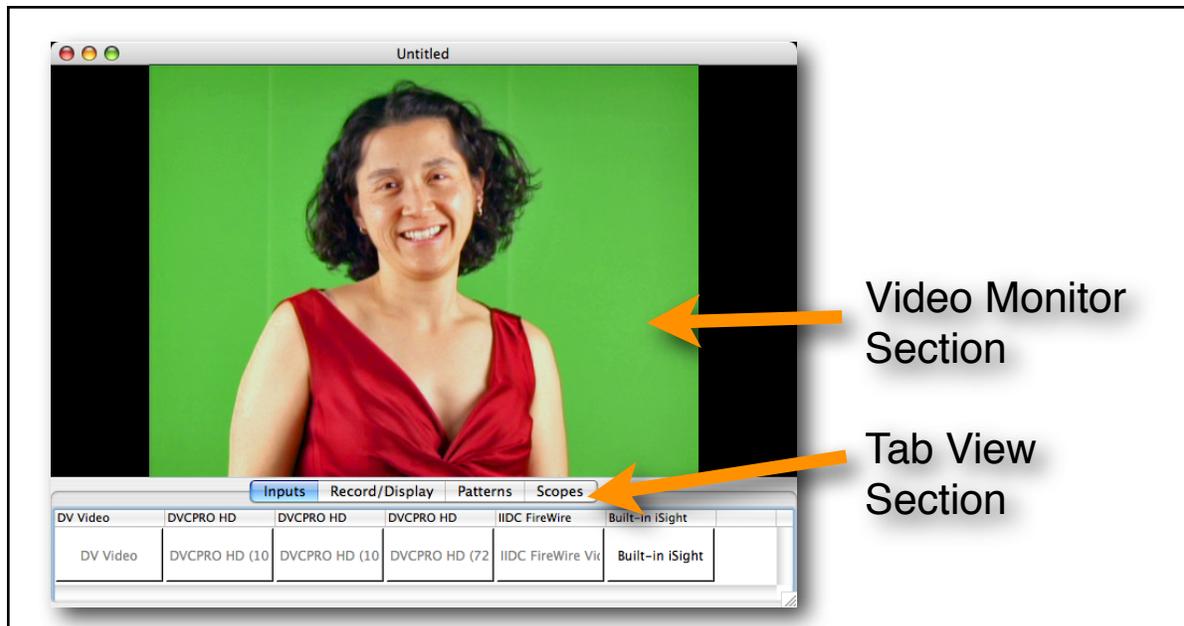
Move the Spill Adjust slider to blend in any halo or fringe color around the edges of the subject.



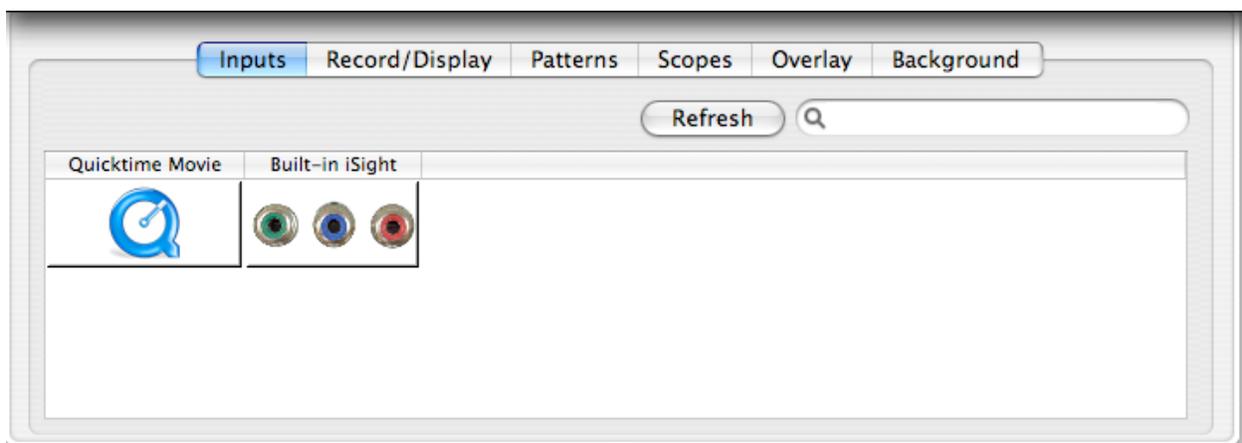
Your final image should be relatively free of the color fringes on the edges. You can further smooth out the edges using the “Edges” Tab View.

The Veoscope Live Interface

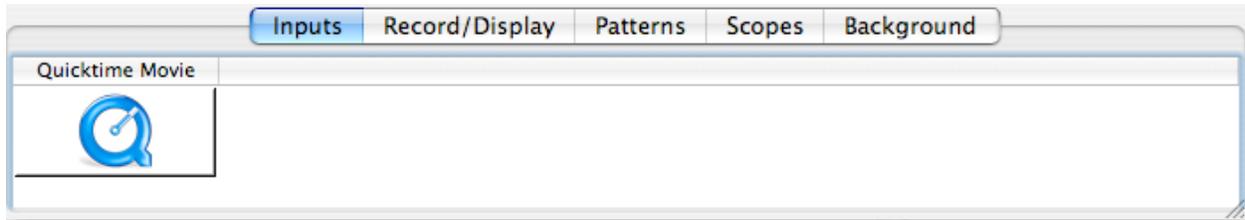
The Veoscope Live interface features a video monitor section and several different tab views. Each one of these tab views contains different controls for adjusting what you see in the video monitor. Each Veoscope Live window is a separate document that can be saved and retrieved. You can have more than one Veoscope Live document open at a time.



Inputs Tab View



The Inputs section allows you to select a live video source. This can be any Quicktime compatible input device, such as an iSight camera, a DV camcorder, or a video stream from a High Definition video capture card. Once a video source is selected, the source button will turn red. Selecting the button again will turn the device off.



Sometimes a blank window with no video input buttons may appear. This is because either a camera or input device is not plugged into your computer, or all the inputs devices are in use. If this problem occurs, free up an input device if you have one in use.

You can, also, use the “Refresh Input Devices..” menu option. This will check for any new cameras that might be attached to your computer.

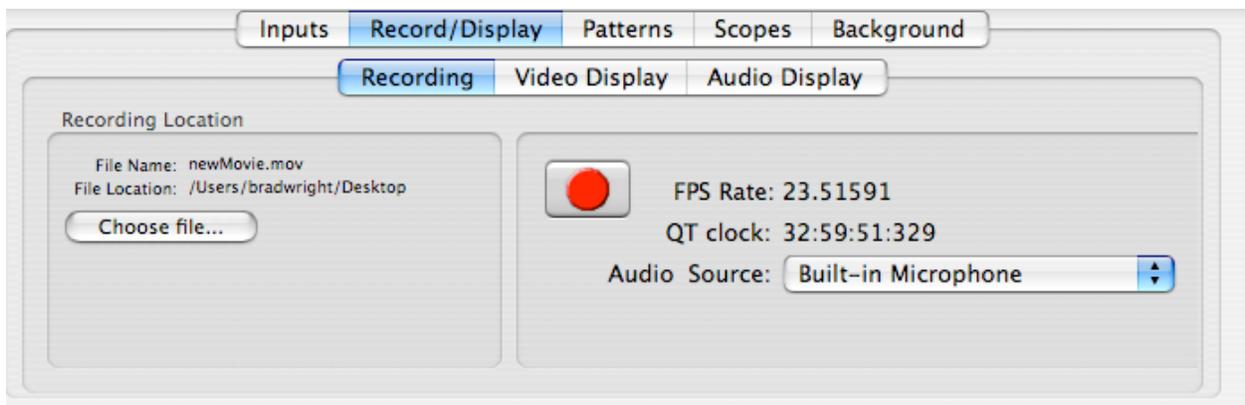


The refresh button on the inputs window will, also, check for new input devices.



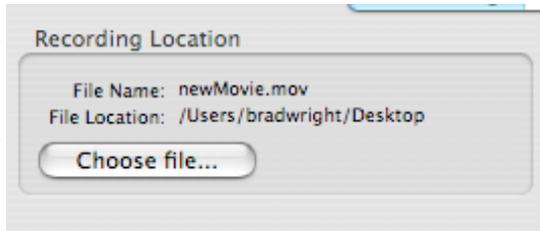
Record/Display Tab View

Recording Sub Tab View



This section controls both the recording features and the aspect ratio of the video.

Recording Location



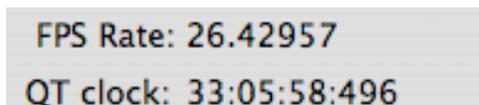
The recording location can be set using the “Choose file..” button. A number will automatically be added to the end of the file name every time the the record button is pressed. This prevents the previous recording files from being overwritten.

Record button



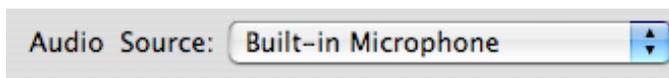
The record button starts and stops the recording process.

FPS Rate and Video behind



This indicates how many frames per second are being displayed in the video preview. The “QT Clock” is the time information that Quicktime is reporting on this video source.

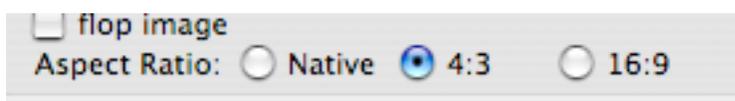
Audio Source



This option is only available when the video input source doesn't contain audio, such as an iSight Camera, or a Black Magic Decklink series card. It allows you to pick the audio device for monitoring and recording.

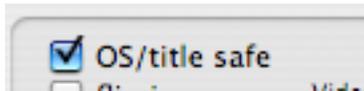
Video Display Sub Tab View

Aspect Ratio



The Aspect ratio displays the video in three different ways. The “Native” selection displays the pixel aspect ratio of the original video stream. The “4:3” selection displays an aspect ratio similar to that of a Standard Definition television. The “16:9” aspect ratio stretches the video to display a widescreen image.

OS/title safe



This option will overlay rectangles on top of the video that represent the Over-scan and Title Safe regions of the video.

Flip Image



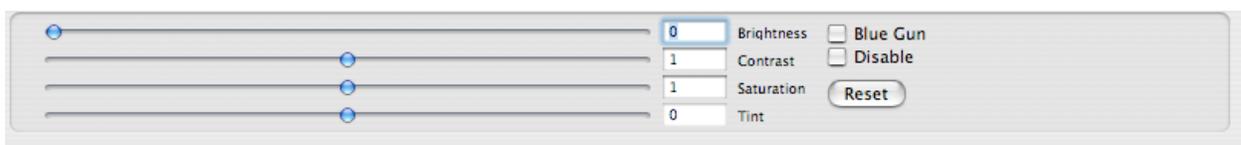
This option turns the video upside down. This can be useful when a 35mm lens adaptor is placed over the front of the video camera, so that the image is displayed correctly on the screen. These adaptors tend to turn the image upside down and this setting will turn it right side up again.

Flop Image



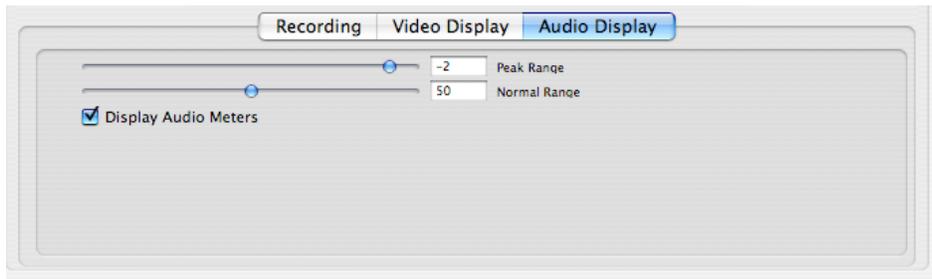
This control creates a mirror like reversal of the image from left to right.

Video Display Adjustment Controls



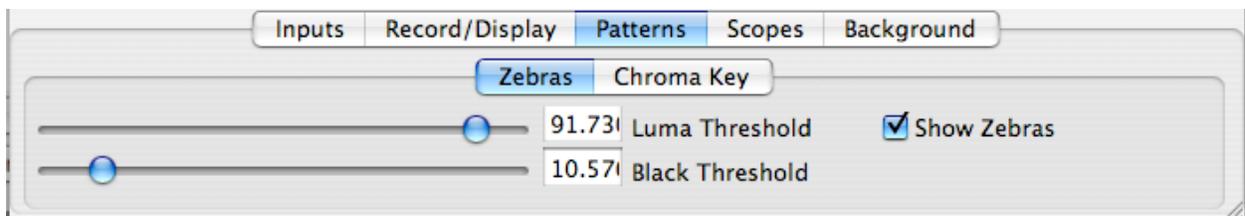
These controls allow you to fine tune the video being displayed. The “Blue Gun” option allows you to see only the blue component of the video. This is useful for making color adjustments. The “Disable” option allows you to turn off the color adjustments. The “Reset” button changes all the color adjustments back to their default settings.

Audio Display Sub Tab View



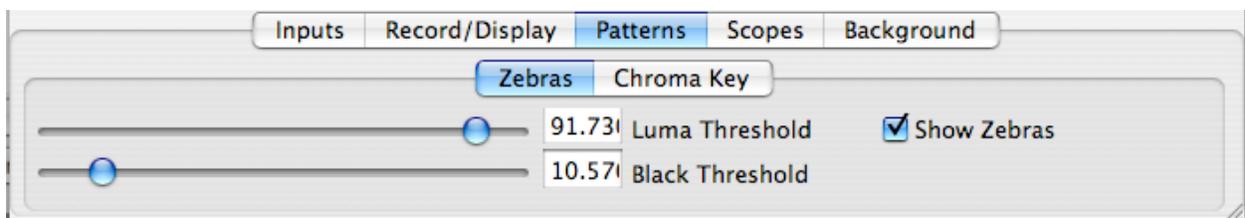
This Area controls the characteristics of the audio meters.

Patterns Tab View



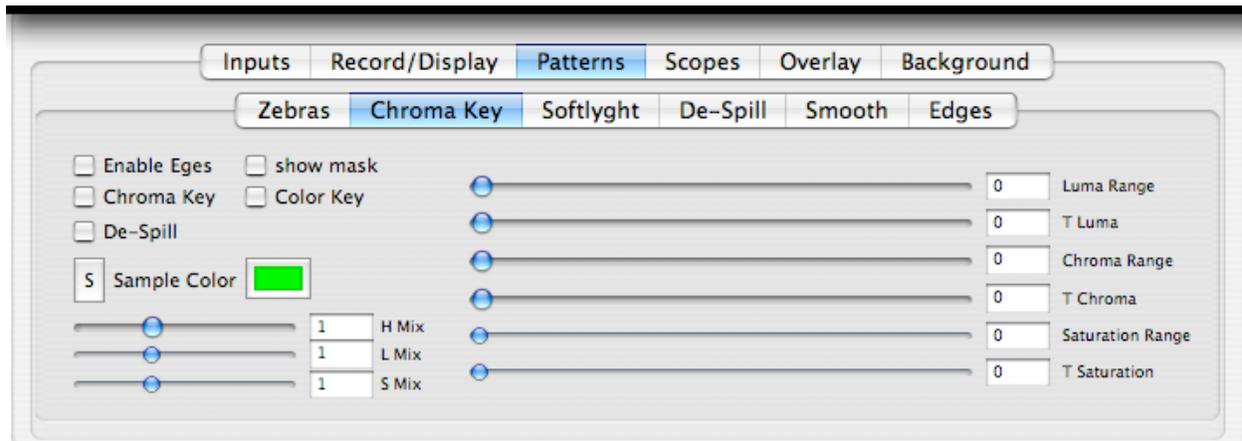
The Patterns Tab View has two sections that display various visual helpers in the monitor window.

Zebras Sub Tab View



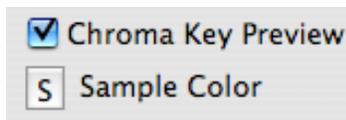
This view displays both a high and low video Zebra pattern. A Zebra pattern is a series of black stripes that are superimposed on the video. These lines are painted on video that is above the "Luma Threshold" setting or below the "Black Threshold" setting. Zebras patterns are useful for spotting over-exposed or under-exposed areas on the screen.

Chroma Key Sub View



Real-time chroma keying is controlled from this sub-view.

Sample Color

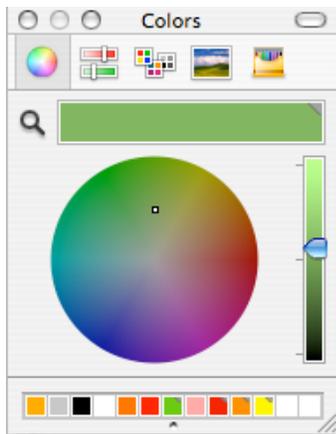


This button is used to select a region on the screen to set the Chroma Key color. Once selected, the mouse pointer will change to a hand. Click on any area of the screen to change it back to a pointer. The color selected will be placed in the Color Well.

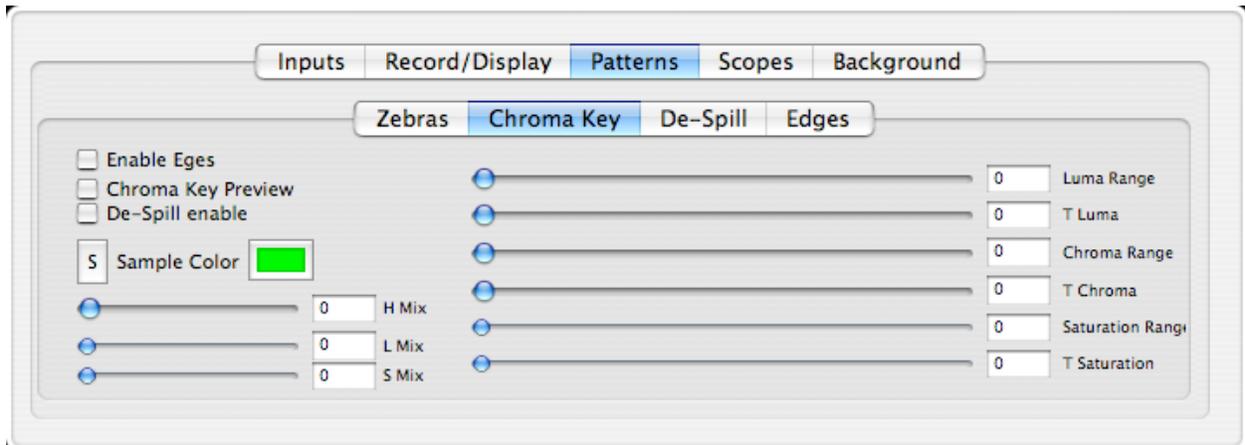
Color Well



The Color Well adjusts the Chroma Key color. Once clicked, a Color Selection panel will appear. Further adjustments to the color can be made from this panel.

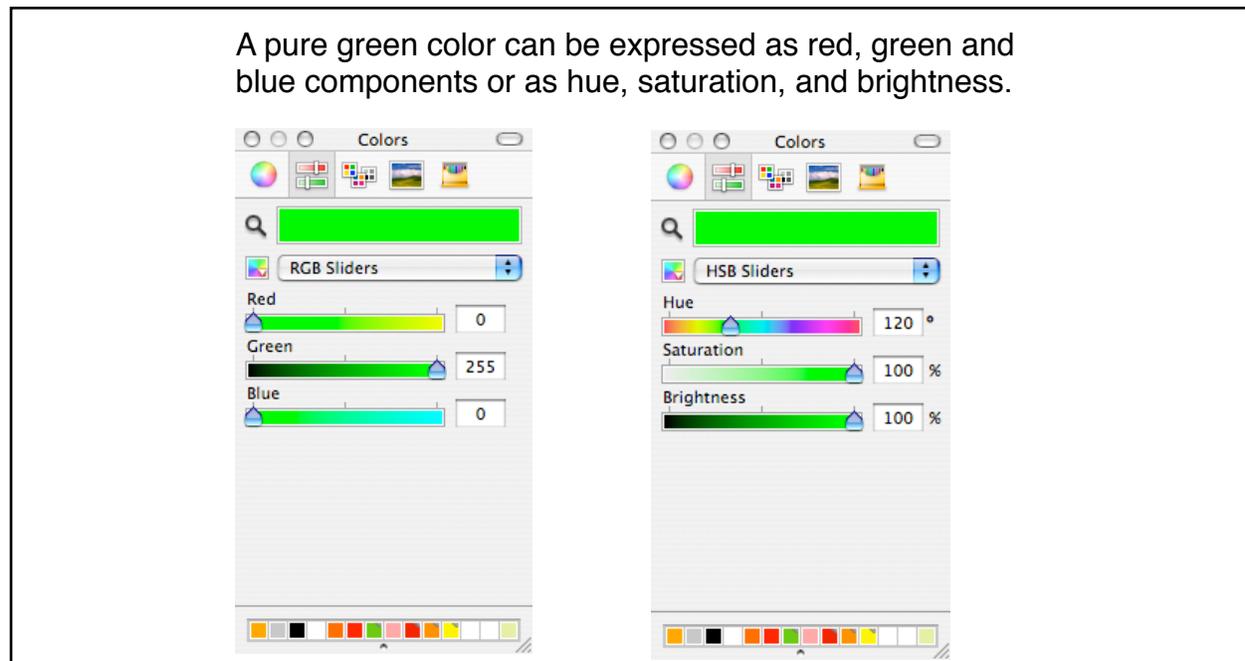


Understanding the Chroma Key Parameters



The Chroma Key effect is controlled by various sliders in the “Chroma Key” tab view. All of the sliders default to zero, so they must be adjusted manually before the Chroma Key effect can be seen. Each slider helps specify the color range used for the Chroma Key.

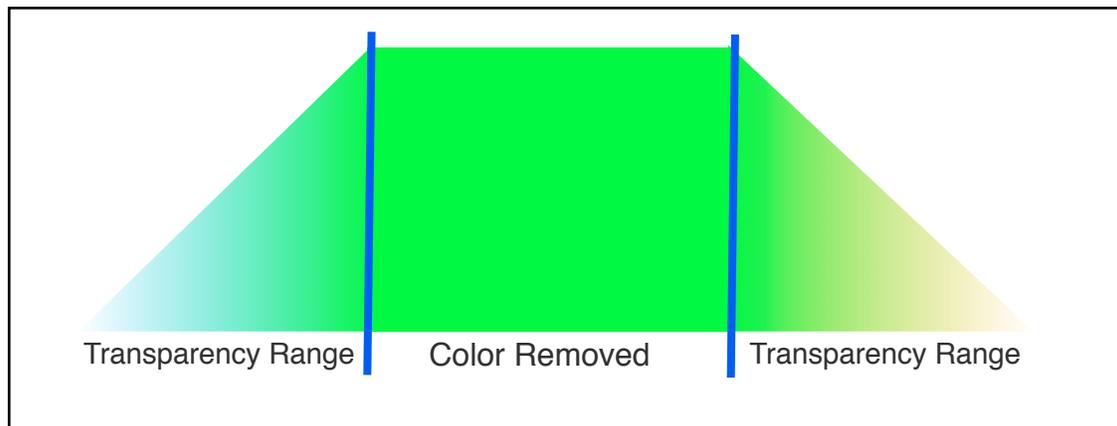
Any color can be expressed in terms of hue, saturation, and brightness (HSB), as well as red, green and blue (RGB) components. Since the Chroma Key needs to operate on a range of similar colors, hue, saturation, and brightness components are used instead of red, green and blue. This allows the Chroma Key to remove not just an exact color match but many different shades of a particular color, as well.



For example, if you are using a simple green backdrop for a chroma key background, the video camera will see many different shades of green within the background, even if the backdrop is a single color and perfectly lit. This happens because of noise in the video camera, slight variations in the backdrop fabric, and variations in the intensity of the light reflecting off the backdrop.

While the “Color Well” allows you to pick the exact color you want to remove, the sliders set the range of similar colors to remove. The Brightness component is controlled by the “Luma” sliders, the Hue component is controlled by the “Chroma” sliders, and the Saturation component is controlled by the “Saturation” sliders.

Each component (Hue, Saturation, Luma) has two different types of sliders . The first slider for each component eliminates the color that falls within that range. Everything within this range is completely removed from the video. This area is shown in the picture below as the “Color Removed” area. Next to this area are two adjacent areas where the color gradually fades away. These are the “Transparency Range” areas.



Using the two controls together a more natural looking edge or transition can be created.

Chroma Key Parameters Explained

Luma Range

This slider changes the variation in brightness allowed for the Chroma Key color.

T Luma

Controls the part of the brightness range that will be transparent.

Chroma Range

The hue variation is controlled with this slider.

T Chroma

This slider sets the range in color that will be transparent.

Saturation Range

The amount of variation in the color saturation is controlled with this slider.

T Saturation

The transparent range of the color saturation.

H Mix

This slider controls the amount of transparency from the hue component to use to create the key. This slider needs to be greater than zero in order to display the Chroma Key effect.

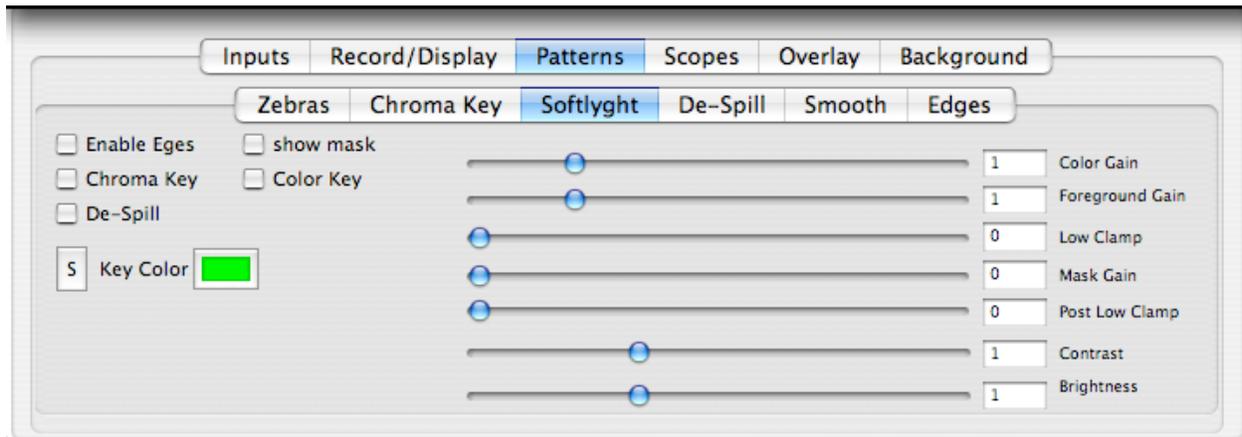
L Mix

The amount of information from the brightness channel to use to create the key. This slider must be greater than zero to see the Chroma Key effect.

S Mix

The amount of saturation used to create the final key. This slider must be greater than zero to see the Chroma Key effect. However, setting it too high will cause all colors to be removed from the video.

Softlyght Tab View



Key Color

This should be set to the color that you want to remove.

Color Gain

This setting controls the strength of the background. A higher value removes more of the background, while a lower value keeps more of the background.

Foreground Gain

This setting controls the strength of the foreground. A higher value removes more of the foreground, while a lower value keeps more of the foreground.

Contrast

This setting creates a harder transition between the foreground and the background.

Mask Gain

This adjusts the brightness of the video that the keyer works on. It only becomes usable if the “Subtract Gain” is set to a lower level than the “Keep Gain”.

Low Clamp

Removes any part of the mask below this minimum threshold.

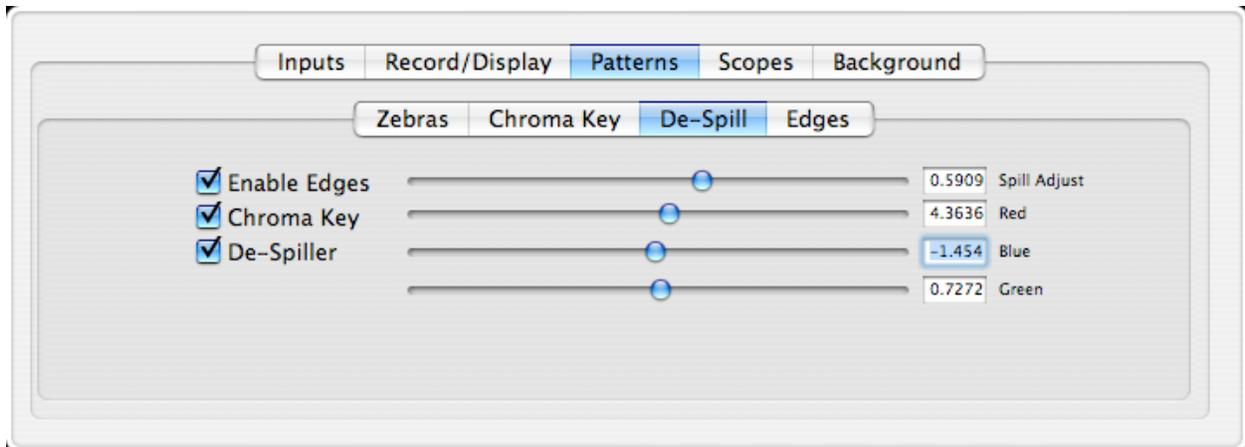
Mask Gain

Boosts the brightness of the mask

Post Low Clamp

Removes any part of the mask below this minimum threshold after the gain has been applied.

De-spill Tab View



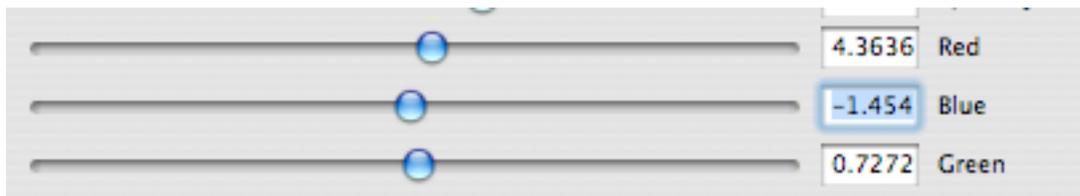
This section controls the amount of unwanted color from the Chroma Key backdrop left over in the video.

Spill Adjust



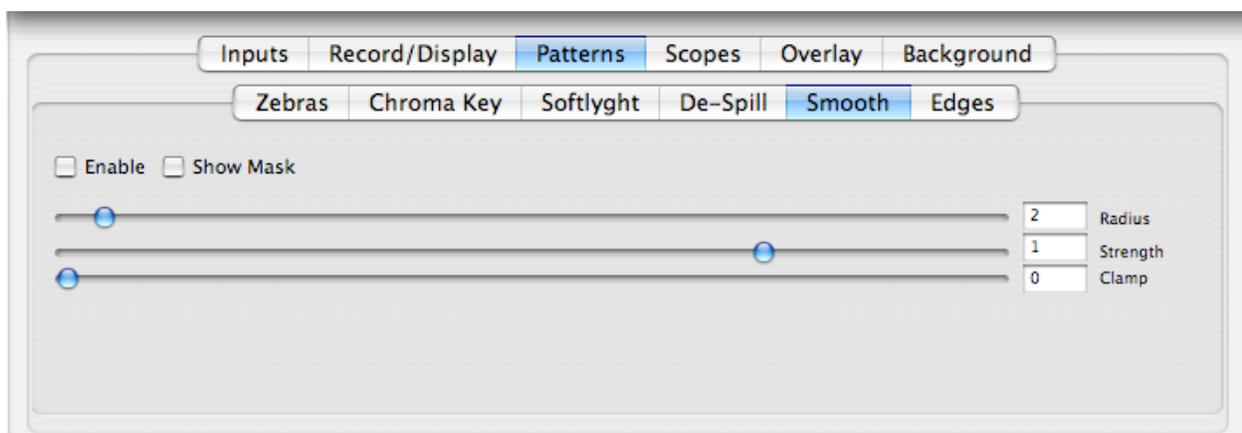
Allows you to fine tune the color you want to extract from the video.

Color Adjustment Parameters



These parameters allow you to adjust the red green and blue components in the remaining video. This can help remove any color cast caused by the De-spiller.

Smooth Tab View



Radius

This option adjusts the size of the area to smooth.

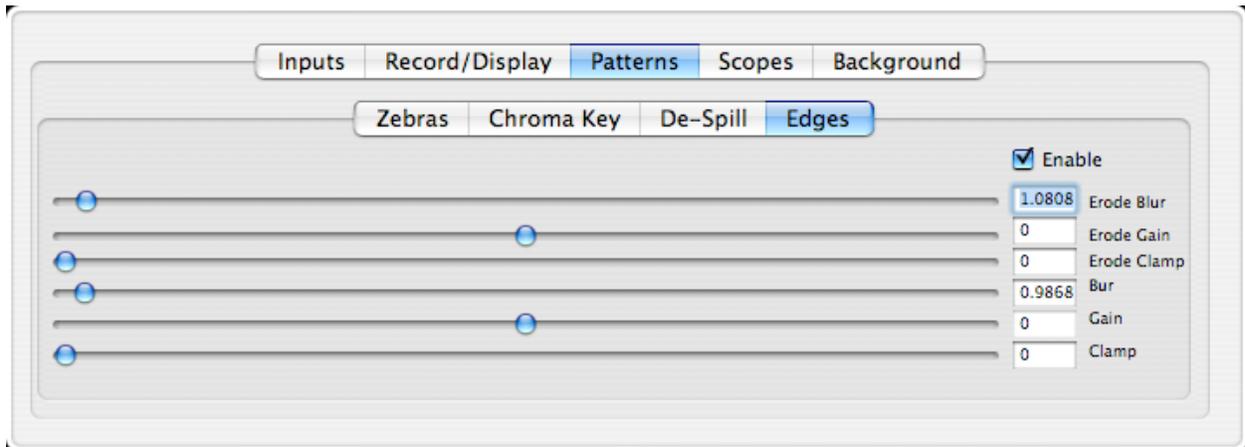
Strength

Adjusts the gain applied to the mask.

Clamp

Removes any part of the mask that falls below this threshold.

Edges Tab View



This section allows you to create a more natural looking edge around the objects being Chroma Keyed.

Erode Blur



The Erode Blur slider shrinks the edges around an object.

Erode Gain



This slider boosts the amount of gain applied to the edge. This causes a sharper transition around the edges of an object.

Erode Clamp



This slider removes any part of the Erode Blur that falls below a certain threshold. This allows you to create a sharp transition around the object.

Blur



This slider effects the entire mask around the object. It provides a softening effect for the edges.

Gain



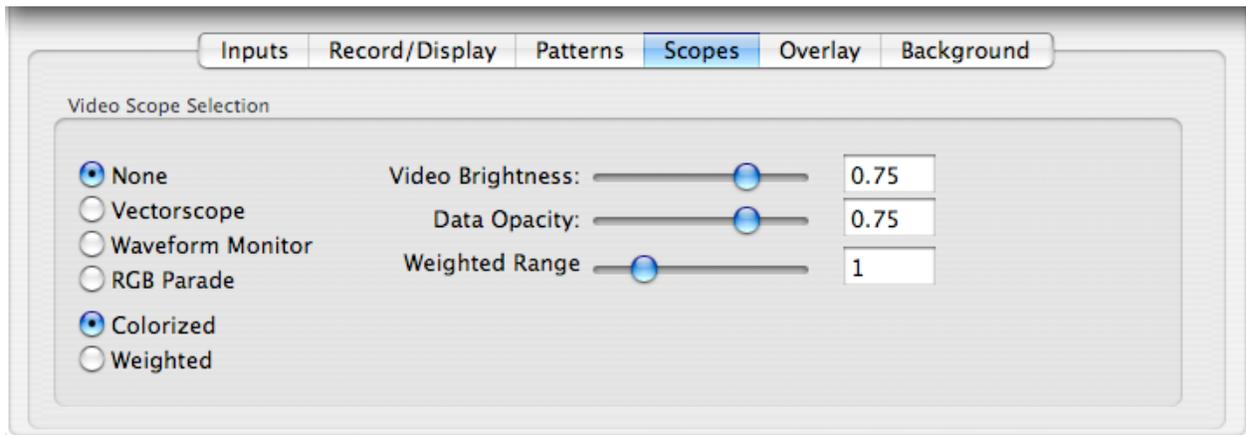
Boosts or reduces the overall brightness of the image mask.

Clamp



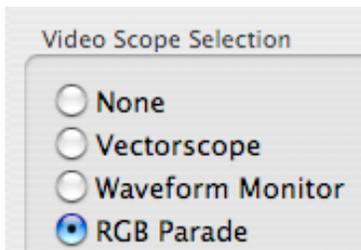
Removes any part of the mask that falls below this threshold.

Scopes Tab View

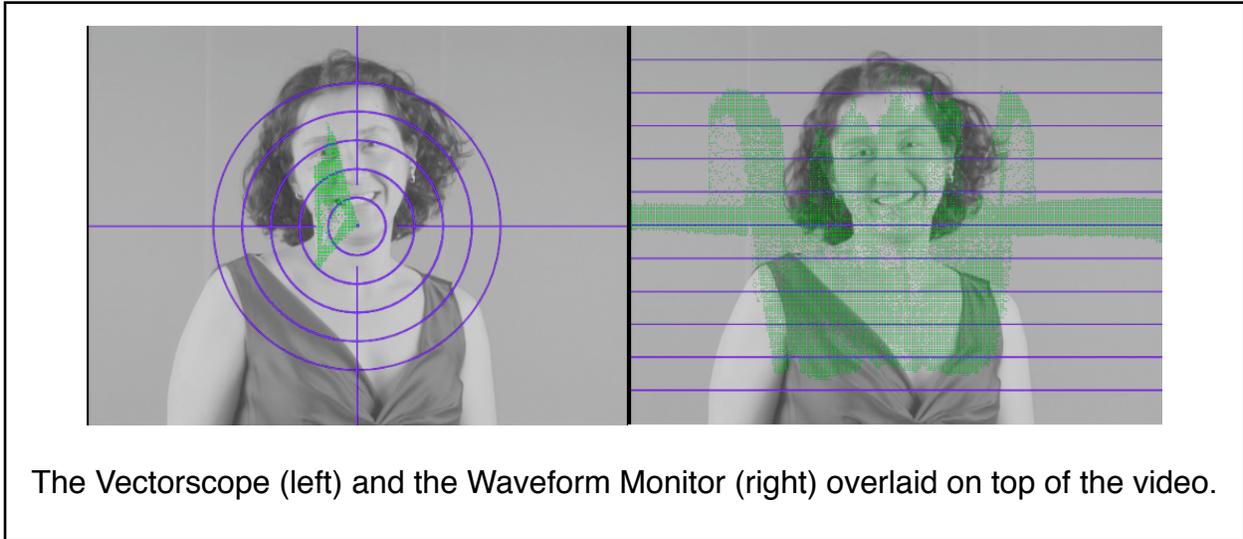


This view allows various video scopes to be displayed.

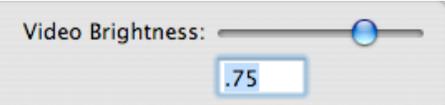
Video Scope Selection



The four options are: “None”, “Vectorscope”, “Waveform Monitor”, and “RGB Parade”. The “Vectorscope” and “Waveform Monitor” options will overlay these scopes directly on top of the video. The “None” options turns the scope off.

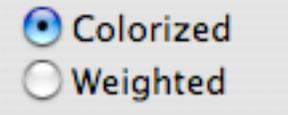


Video Brightness



This option adjusts the brightness of the video underneath the scope. This is useful when looking more closely at the data being displayed by the scope.

Colorized/Weighted Selection



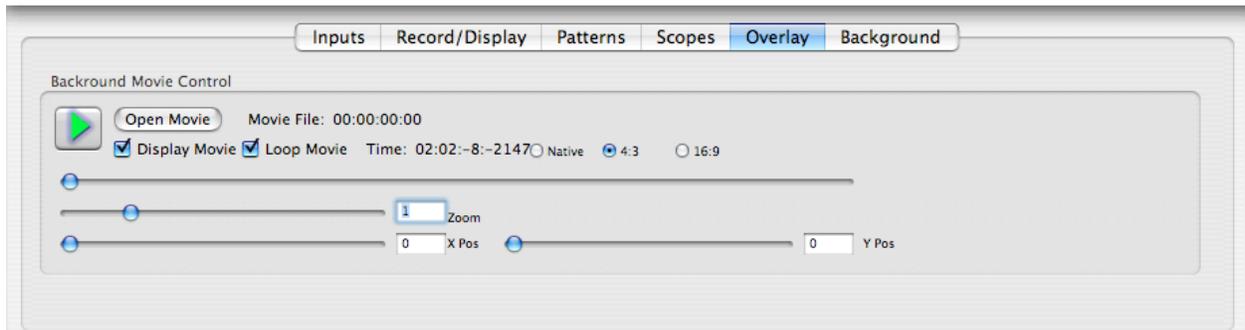
The colorized and weighted options control the type of data being displayed.

Weighted Range



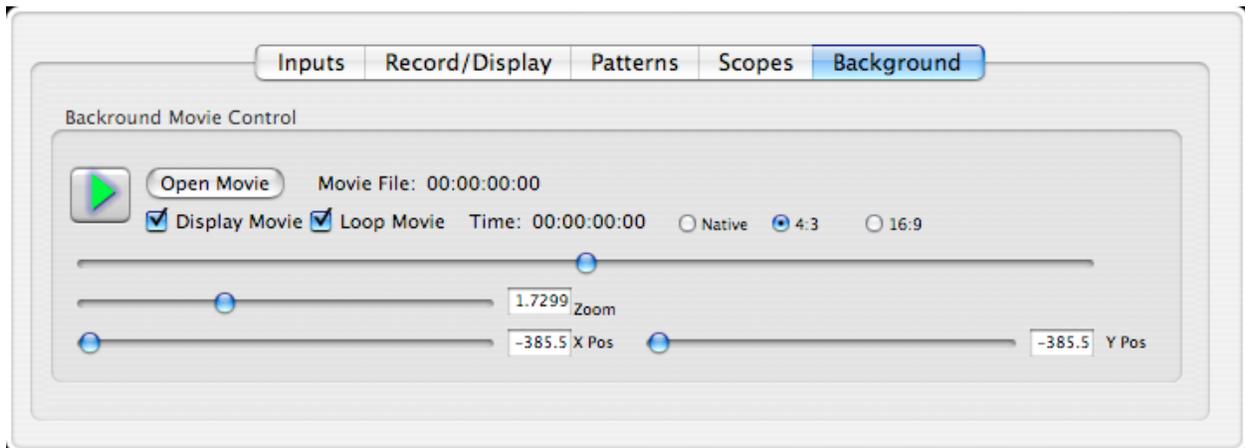
The option controls the amount of weighting that is applied to each pixel on the screen.

Overlay Tab View



This view allows you to place a Quicktime movie or Image in the foreground. The Alpha channel in the image or movie is used for transparency.

Background Tab View



This view allows you to place a Quicktime movie in the background. This feature can be seen when the Chroma Key preview is enabled.

Trouble Shooting Veescop Live

The video preview window seems slow or jerky?

Veescop Live needs an Open GL 2.0 compatible graphics card in order to playback at the full frame rate. The Intel Macintosh computers work very well with VeeScope Live. Older G5, G4, or G3 Macintosh system may not be fast enough for smooth playback, but Veescop Live will still run on these systems.

I don't see any video input buttons?

If a camera is not plugged in or the computer does not have a built in iSight camera, no Input buttons will be displayed. You need to close the current window and connect a camcorder or a Quicktime compatible input device.

Why can't I hear the sound when I record with the iSight Camera?

The iSight camera does not contain a microphone. The current version of Veescop Live does not allow the computer's built in microphone to be used for recording.