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# Keylight

User Guide for Keylight on Adobe After Effects

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Keylight User Guide

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## Introduction

Welcome to this User Guide for Keylight on After Effects.

Keylight is an Academy award winning blue and green screen keyer. The core algorithm was developed by the Computer Film Company and has been further developed and ported to After Effects by The Foundry.

We hope you enjoy using Keylight.

## About this Manual

Use the Quick Key chapter to see how a simple key is pulled using Keylight. The Basic Keying Chapter goes over the most common parameters you'll need to pull a variety of keys. The Advanced Keying Chapter explains how to tackle difficult keys.

## Release Notes

For information on system requirements, new features, improvements, fixed bugs and known bugs & workarounds, see “Appendix A” on page 69.

## Installation on Mac OS X

To install Keylight on a Mac follow these instructions:

1. Double-click on the Keylight Installer - Keylight1.0v4.pkg
2. Follow the on screen instructions to install Keylight.
3. Quit.

Keylight can be found in the Effect - Keying menu.

## Installation on Windows

To install Keylight on a PC follow these instructions:

1. Double-click on Setup.exe in the Keylight folder.
2. A window will appear welcoming you to the Keylight Setup. Click Next to continue to the license agreement.
3. When the software license agreement appears, please read it. If you agree, click Yes to continue the installation.
4. Choose the location to install Keylight on your hard disk. To accept the default location, and it is strongly recommended that you do, just click Next to continue.
5. The Keylight plug-in will be installed.
6. Click Finish to quit the installer.

Keylight can be found in the Effect - Keying menu.

## About The Foundry

The Foundry specialises in developing plug-in visual effects for compositing platforms in the film and video industry. Based in London's Soho, the Foundry has tailored its image processing tools to the needs of post production.

Tinder plug-ins have been developed by the Foundry and have been sold to hundreds of users throughout the world. They are available on the leading compositing platforms including flame\*, flint\*, inferno\*, fire\* and smoke\* from Discreet, Avid|DS and Adobe After Effects.

Furnace is a rich collection of image processing tools to help compositors tackle common problems when working

on films. Plug-ins include wire removal, retimer, rig removal, texture plug-ins, grain tools, steadiness and deflicker.

Anvil is a set of colour correction and colour manipulation tools. It was originally developed by Paul Grace at First Art and is now available on a variety of platforms.

Visit The Foundry's web site at [www.thefoundry.co.uk](http://www.thefoundry.co.uk) for further details.

## About CFC

The Computer Film Company (CFC) pioneered the field of digital film compositing and today operates a state of the art film effects facility in London. The company has always invested in research, and maintains the kind of edge that has twice been honoured with Technical Achievement Awards from the Academy of Motion Picture Arts and Sciences.

Visit Framestore-CFC's web site at [www.framestore-cfc.com](http://www.framestore-cfc.com) for further details.



# Getting Started

## Introduction

Keylight has been refined over a number of years to make keying quicker and easier while providing a depth to the tools that will tackle even the most challenging shots.

Keylight was first developed by The Computer Film Company to help with difficult keys feature films. Over the years Keylight has been refined in production on hundreds of films. This pioneering work on digital compositing was honoured with a Technical Academy Award<sup>®</sup> in 1996.

## Notation

When we refer to blue screens throughout the text we mean, of course, blue or green screens.

## Quick Key

Keylight is available from the Effect - Keying menu in After Effects.

Consider this shot from *The Saint*, pictures courtesy of

CFC and Paramount British Pictures Ltd. Figure 1 is the



Figure 1. Blue Screen.

blue screen foreground that should be composited over the background shown in Figure 2.



Figure 2. Background.

If you want to have a go of this shot, you can! The images can be downloaded from our web site and this quick key is also covered in the Tutorial Chapter. See “Tutorial 1: Simple Key” on page 47.

Throughout this user guide we assume a good understanding of After Effects. To perform this quick key, do the following:

1. Create a new composition using SaintFG.tif and SaintBG.tif, layer the clips with the blue screen over the background as shown in Figure 3.

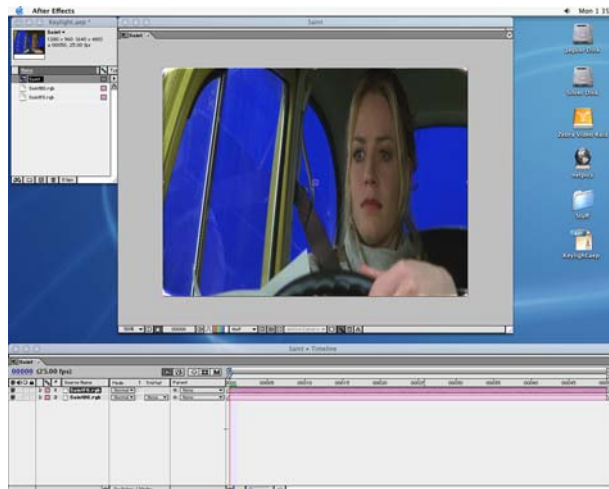


Figure 3. Screen Shot showing Saint blue screen.

2. Select the blue screen clip (SaintFG.tif) in the Time Layout window and apply Keylight from the Keying sub-menu of the Effect menu. See Figure 4.

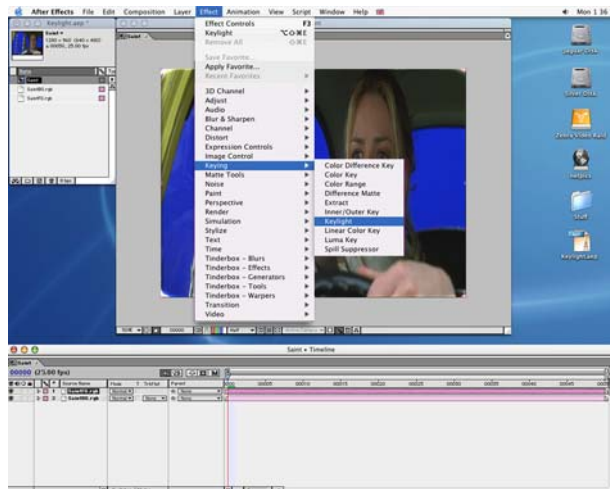


Figure 4. Apply Keylight from the Effect - Keying menu.

3. The Keylight parameters are shown in Figure 5.



Figure 5. Keylight Parameters.

4. Select the Screen Colour eye dropper and click on the blue screen in the composition window. A good place to pick is the blue from



Figure 6. Pick the blue from the back windscreen.

the back windscreen as this has no reflections. Picking this blue will key the back windscreen perfectly leaving reflections in the side window. See Figure 6.

5. That's it. In many cases this is all you will need to do to perform a key, since selecting the screen colour creates a matte and despills the foreground. The final composite is shown in Figure 7.



Figure 7. Final composite.

There are a couple of extra steps that can be taken to fine tune this key and these are discussed in “Tutorial 2: Fine Tuning a Key” on page 52.

Picking the screen colour may be enough for a lot of keys, but there are many more tools within Keylight that can be

used to tackle more complicated shots. These are described in later chapters.

---

## Basic Keying

The following section describes the parameters you need to do basic keying. This will give you enough to tackle most simple keys. A discussion of advanced parameters to fine tune keys and tackle complex keys can be found in the next chapter.

## Screen Colour

The Screen Colour is probably the most important parameter and you should always pick the screen colour before doing anything else. It should be set to the colour of the green or blue curtain behind the foreground object. Select the eye dropper and pick the screen colour directly from the composition window. Setting the Screen Colour will create a matte - the Screen Matte - and despill the foreground. In some cases this is enough to get a decent key. For more information on Screen Colour see page 21.

Figure 8 shows a well lit blue screen behind an actor. You



Figure 8. Blue Screen.

should note that repeatedly picking the Screen Colour will

override any previous selections. It will not add to previous selections and key more of the image with each click. To key more of the image, if the foreground is showing through the background, you need to use the Screen Strength parameter.

## View

After picking the Screen Colour it's useful to be able to view the key in different ways. You can do this using the

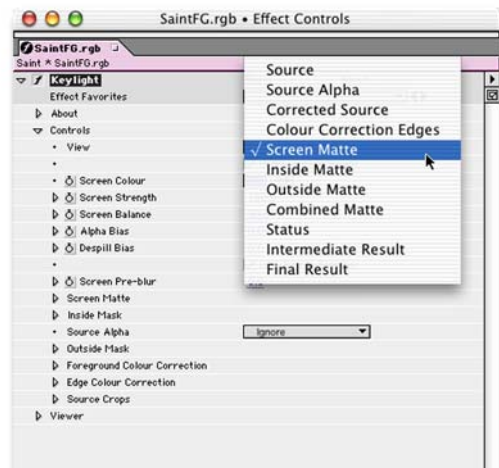


Figure 9. View Menu.

View Menu, shown here in Figure 9. The options you'll use the most are:

- **Screen Matte** - this renders the matte created by picking the screen colour.
- **Status** - this renders an exaggerated view of the mattes so that minor problems are shown clearly.

- **Final Result** - this renders the foreground composited over the background using all mattes, spill and colour corrections.

## Status

The Status is one of the options in the View menu and shows an exaggerated view of the key so that you can make a more informed decision when refining the composite. Figure 11 shows the Status display after the



Figure 10. Green Screen.



Figure 11. Status.

screen colour has been picked from the image shown in Figure 10. Three colours are displayed. Black pixels show areas that will be pure background in the final composite. White pixels show areas that will be pure foreground. Mid-grey pixels will be a blend of foreground and background pixels in the final composite. You need grey pixels around the edge of the foreground to get a good key at the foreground edge. However, if there are grey pixels where there should be pure background, you should try to remove these with the Screen Strength, Clip Black or Outside Mask. If you have grey pixels where there should be pure foreground this tells you that parts of the background will

show through here and you will need to firm up the foreground with Clip White or an Inside Mask.

Pixels that are a blend between the foreground and background are shown in just one shade of grey. This is done to highlight potential problems with the key. These grey pixels may represent a foreground/background blend of 50/50 or 99/1. No distinction is made as to this ratio.

You may occasionally see other colours in the Status View and these are covered on page 31 in the Advanced Keying Chapter.

## Screen Strength

The Screen Strength controls how much of the screen colour is removed to make the screen matte. Increasing this



Figure 12. Status View after picking the Screen Colour.

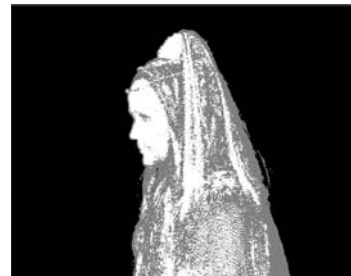


Figure 13. Status showing the increase in Screen Strength.

value will key more. Figure 12 shows the Status View after picking the Screen Colour. You can clearly see that parts of the background are grey where they should be black. When composited you may see faint pixels from the foreground where you should be seeing pure background. Increasing

the Screen Strength will fix this, as shown in Figure 13, but increasing it too much will destroy your good work. Like many keying parameters it's a balance - not too much, not too little. Increasing the Screen Strength too much will lead to the background showing through the foreground and edge detail will be destroyed. Figure 15 on page 19 shows



Figure 14. Screen Strength = 105 giving a good Screen Matte.



Figure 15. Screen Strength = 150 giving background show through and over eroded edges.

this quite well. Note the steering wheel is black when it should be white. If you look at the composite you will see the background showing through here. Also, some of the fine hair detail on the actor, visible in Figure 14, has been eroded in Figure 15.

## Despill Bias

Although the foreground is despillled automatically, you may find the need to pull out a little more of the screen colour after picking from the image. You can do this with the Despill Bias control. Just increase the parameter until the blue disappears. However, if you increase too much the

foreground will become transparent. There are ways to fix



Figure 16. Exaggerated blue spill. Figure 17. Despill Bias used to remove the blue spill.

that and these are covered in the next chapter. See “Alpha Bias” on page 27.

# Advanced Keying

The following section describes the parameters you need to fine tune keys and get the most out of Keylight. Basic parameters covered in the previous chapter may also be covered here in more detail.

## Screen Colour

The screen colour represents the colour of the pure blue (or green) screen. The first thing you should do when pulling a key is pick the Screen Colour. This single colour has a primary component, blue or green, and that has a saturation. Once the screen colour has been picked, Keylight analyses all the pixels in the image and compares the saturation of the primary component in each of these pixels with the corresponding saturation of the screen colour, setting the alpha and modifying the colour accordingly.

**Background Pixel** If the saturation of the pixel in the image is as strong, or

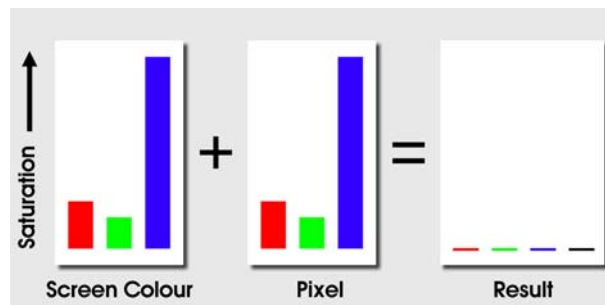


Figure 18. Blue screen pixel set alpha to zero.

greater than the screen colour, then it'll be a pixel from the blue screen background, and that pixel will be set to completely transparent and black. See Figure 18.

**Edge Pixel** If the saturation of the pixel is less than the screen colour, then it'll be the edge of the foreground object, and we subtract some of the screen colour from the pixel (de spilling) and set the image to semi-opaque. See Figure 19.

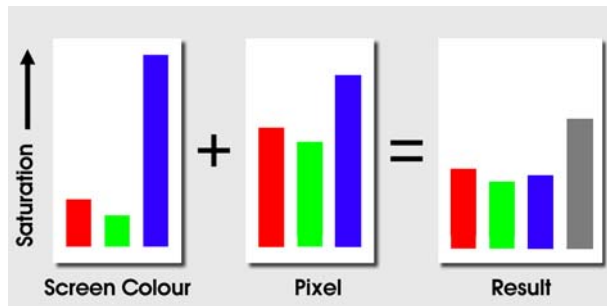


Figure 19. Edge pixel gives partial alpha.

**Foreground Pixel** If the primary component in the pixel is not the same as the primary component of the screen colour we have a

foreground pixel, and the alpha is set to completely

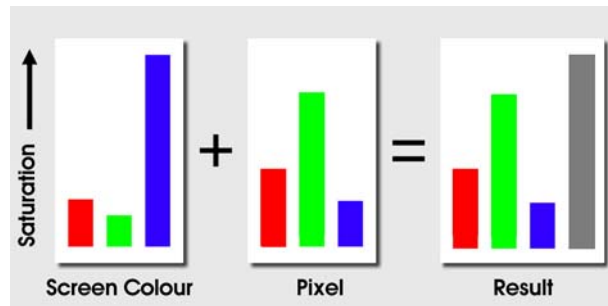


Figure 20. Foreground pixel gives full alpha.

**Note** *opaque. The pixel colour is not modified. See Figure 20. You should note that the Screen Colour is a single colour. You are not picking lots of colours that are keyed out.*

## Screen Balance

Saturation is measured by comparing the intensity of the primary component against a weighted average of the two other components. This is where the **Screen Balance** control comes in. A balance of 100% means that the saturation will be measured against the smallest of the other two components in the screen colour.

A balance of 0% means that the saturation will be measured against the larger of the other two components. A balance of 50% will measure the saturation from the average of the other two components.

The appropriate balance point for each image sequence you key will be different depending on the colours in that image. Generally speaking, blue screens tend to work best

with a balance of around 95% and green screens with a balance of around 50%. If the key is not working too well with these settings, try setting the balance to about 5%, 50% and 95% and see what works best.

## Despill Bias

In situations where the key is removing too much screen colour from the image or not enough, the **Despill Bias** can be used to adjust the key. Roughly speaking, you should use a negative bias when there is too much of the screen colour being removed and a positive one when there is not enough.

## Negative Bias

Consider the image shown in Figure 21. This shot, from the



Figure 21. Is this the worst green screen you've ever seen?

film *Executive Decision*, is actually a green screen although it doesn't look it. The colour of the screen in the background is around 28% red, 25% green and 8% blue. This is in fact red, but only just. Note that the pilot in the cockpit is predominantly brown, at around 42% red, 25%

green, 15% blue. So a default key from that screen colour would make the foreground transparent (Figure 22) as it is a more saturated red than the red of the screen colour. This is not good.



Figure 22. Default key showing the transparency of the foreground.

In this situation, the Despill Bias can help. By decreasing this value slightly (negative bias), you scale down the red

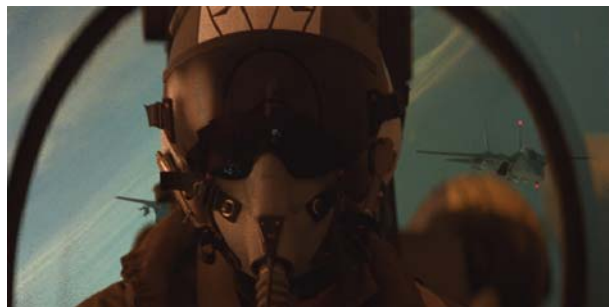


Figure 23. Result of dropping the Despill Bias to -17.

component in the screen colour and the image. This flips the screen colour of the shot from red to green, which

leaves the pilot predominantly red. Figure 23 on page 25 shows the new composite. Keylight has now keyed this image correctly. We have effectively instructed Keylight to see “less red” in both the screen colour and the foreground.

## Positive Bias

Despill Bias also helps when keying images that don’t have enough of the screen colour removed. Consider Figure 24 from the film Merlin. Pulling a default key will



Figure 24. Original blue screen.



Figure 25. Default key.

give the blue/purple fringing around the edges of her hair as shown in Figure 25.

If we increase the Despill Bias (positive bias), the image and the screen colour will have the blue component scaled up before the key is pulled, effectively saying “No, it’s bluer than you thought, pull more out”. This improves the blue spill as shown in Figure 27 on page 27, but can make

the foreground transparent as shown in Figure 29. This can



Figure 26. Default Key.



Figure 27. With Despill Bias to remove blue spill.

be fixed with a soft eroded inside mask and a replace colour set to light brown to match the skin tones. However, there is another way using the Alpha Bias.



Figure 28. Screen Matte with Despill Bias zero.

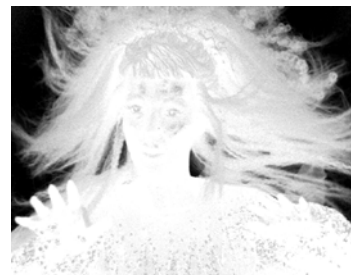


Figure 29. Screen Matte after increasing Despill Bias.

## Alpha Bias

Keylight does two things when making a key. It makes sections corresponding to the screen colour transparent and it removes that colour from the foreground. Sometimes it can get one right, but the other wrong, and this often

happens when you use just the Despill Bias control as shown above.

One way around this is to un-couple the Despill and Alpha Bias controls so that the alpha is calculated using the Alpha Bias and the despill is calculated using the Despill Bias. Therefore, in the previous example, we should set the Alpha Bias to zero to get a good solid alpha (Figure 31), and set the Despill Bias to around 27 to remove the blue spill. (Figure 30).



Figure 30. Despill Bias 27 to remove blue spill.



Figure 31. Alpha Bias 0 to improve the Screen Matte.

## View

After picking the Screen Colour it's useful to be able to view the key in different ways. You can do this using the



Figure 32. View Menu.

View Menu, shown here in Figure 32. Here's the complete list of options and what they do.

- **Source** - displays the blue or green screen.
- **Source Alpha** - displays the alpha channel embedded in the blue or green screen.
- **Corrected Source** - displays the uncomposited source image with any colour corrections applied.
- **Colour Correction Edges** - displays the foreground edges as a matte that will be colour corrected using the controls in the Edge Colour Correction folder.
- **Screen Matte** - displays the matte created as a result of picking the screen colour.

- **Inside Mask** - displays the mask that firms up the foreground.
- **Outside Mask** - displays the mask that cleans up the background.
- **Combined Matte** - displays all the screen matte, inside and outside masks and any source alpha added together. The combined matte is used to composite the foreground over the background layer.
- **Status** - displays an exaggerated view of the key so you can make a more informed decision on how to improve the result. **See “Status View” on page 30.**
- **Intermediate Result** - is used for multipass keying. The alpha is set as per normal, but the RGB values are not modified from the original.
- **Final Result** - renders the foreground composited over the image on the background track. This image is premultiplied. In other words, the RGB values of pixels have been multiplied by their corresponding alpha channel values.

## Status View

The Status View is one of the options in the View menu and shows an exaggerated view of the key so that you can make a more informed decision when fine tuning the

composite. Figure 34 shows the Status after the screen



Figure 33. Green Screen.



Figure 34. Status.

colour has been picked from the image shown in Figure 33 on page 31. Three colours are displayed. Black pixels represent pure background in the final composite. White pixels are pure foreground and grey pixels are a blend of the foreground and background pixels. The grey is just one colour to highlight any areas that are not pure foreground or background. Grey pixels do not mean the key is poor - the final composite may be fine.

You may occasionally see other colours in the Status View.



Figure 35. Status showing processing of the Screen Matte.



Figure 36. Result showing Screen Matte Replace Colour.

Figure 35 shows black, white, grey and green pixels. The

green pixels are a warning. They show you the parts of the Screen Matte that have changed through processing the matte (clipped, softened or eroded). These areas have had the correct amount of spill removed, but the alpha has subsequently changed and the composite may no longer look right. This can be corrected using the Replace Colour to put back colour in these areas. Figure 36 on page 31 is an extreme example to illustrate the point. The Replace Colour has been set to pure red and you can see that this mirrors the green pixels in the Status View.

Similarly you may see blue pixels in the Status. These

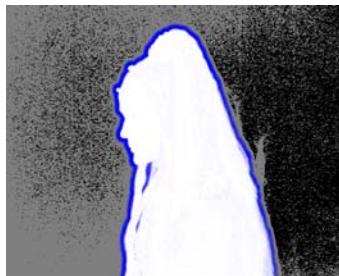


Figure 37. Status showing how the Inside Mask will affect the foreground.



Figure 38. Final Result showing the Inside Mask Replace Colour.

represent processed pixels in the Inside Mask that affect the despill of the foreground. The Replace Colour in the Inside Mask folder will be used to modify these pixels. Another extreme example is shown in Figure 38. The Replace Colour is set to pure yellow and the Replace Method is Hard Colour.

You may also see dark red pixels which indicate areas where an outside mask has been used to reduce the

transparency of the image.

## Screen Matte

The Screen Matte (Figure 40) is the result of pulling the blue or the green from the image (Figure 39) and making those regions transparent. Once you have done this you



Figure 39. Green screen.



Figure 40. Screen Matte.

will want to firm up the foreground (make it more white) and clean up the background (make it more black). This can be done by processing the Screen Matte.

## Clip Levels

The clip levels are adjusted using two parameters - Clip Black and Clip White. Any alpha value at or below Clip Black will be set to zero and any alpha value at or above

Clip White will be set to 100. Figure 41 shows the original



Figure 41. Clip Black = 0.

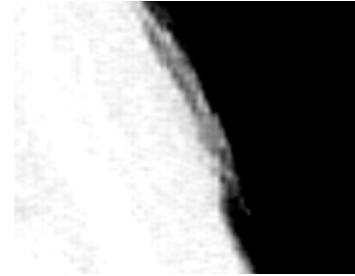


Figure 42. Clip Black = 50.

alpha of an image and Figure 42 on page 34 shows the result of clipping it. Notice how the grey areas in the black background have been reduced and that the grey edges have hardened up considerably. When compositing, the Clip Black control can be used to improve the background image if parts of the foreground are showing through. The Clip White control on the other hand can be used to firm up the centre of the matte, making it less transparent to the background.

**Note** *You need to be really careful if you chose to use Clip Black and Clip White that you don't destroy the edges on your foreground. It is possible to use Clip Rollback to compensate for this.*

## Clip Rollback

Pulling a Screen Matte (Figure 43) will typically produce lots of transparency (grey) in the matte at the edges. This is good since this is what you need to key hair well. You may also get transparency in the foreground as shown in Figure 44. This is bad as your subject will appear slightly

see-through, and this should be corrected. You can do this



Figure 43. Screen matte highlighting the close up view as shown in Figure 44.

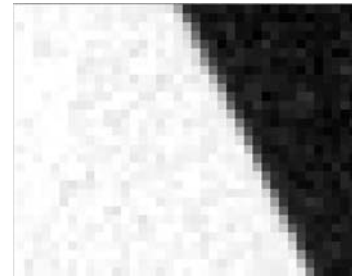


Figure 44. Close up screen matte showing unwanted (grey) transparency in the (white) foreground.

with an inside mask shape, or you can use the Clip White parameter to turn these grey pixels white. This cleans up the foreground (Figure 45) but it will also destroy the edge detail you want to keep. This is where Clip Rollback comes in. This is used to put back the edges to restore the detail that was lost. A rather exaggerated clip rollback is shown in Figure 46 to illustrate the point.

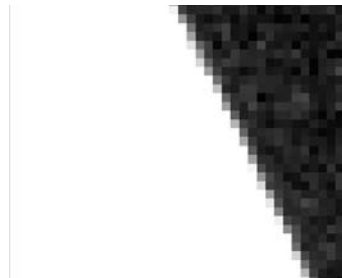


Figure 45. Clip White has been used to remove the unwanted grey pixels in the white matte.



Figure 46. Clip Rollback has been used to reduce the unwanted erosion of the edge.

## Grow & Shrink

This control should not normally be used as eroding the edges can produce a very poor key. However, this parameter allows you to grow (if greater than zero) or shrink (if less than zero) the alpha in the Screen Matte. These controls are sub-pixel accurate.



Figure 47. Screen Matte.



Figure 48. Eroded Matte.

## Despot

This controls how much to simplify the matte. It coagulates similar regions so that, for example, black specks in the white matte can be absorbed by the surrounding white areas. Increasing the Screen Despot Black will remove isolated spots of black in the white matte. Increasing

Screen Despot White will remove isolated spots of white in the background up to that size.



Figure 49. Eroded matte.

Figure 50. Despot.

## Colour Replacement

Remember that Keylight does two things - it removes the screen colour to despill the image and generates an alpha (Screen Matte) to composite the foreground over the background layer.

If you then process the Screen Matte, for example, by eroding the matte or changing the clip levels, Keylight will be removing the wrong amount of screen colour from the pixels whose transparency have now changed. The **Replace Method** instructs Keylight how to deal with such pixels. The Status will display which pixels use a replace method. Those pixels who use a replace method because the Screen Matte processing tools modified the transparency will be green, whilst those pixels whose transparency was modified by the inside mask will be blue. See the Status View on page 31.

There are four options to the replace method, these are:

1. **None** - the despilled image is left untouched if the alpha is modified.
2. **Source** - the image will have a corresponding amount of the original pixel (screen colour and all) reintroduced/removed if the alpha is changed.
3. **Hard Colour** - the despilled image has a corresponding amount of the replace colour added for any increase in alpha.
4. **Soft Colour** - the despilled image has a corresponding amount of the replace colour added for any increase in alpha, however, it attempts to modulate the luminance of the resulting pixel so that it matches the original pixel. This will give a more subtle result than the Hard Colour option.

## Inside & Outside Masks

If you can't adequately improve the Screen Matte using the Clip Levels, you can draw a spline mask round the pixels you definitely want to be foreground or background. The Inside Mask makes the foreground less transparent and the Outside Mask is used to clean up the background that might have bits of the foreground showing through. The outside mask is often used to clean up screens that are not a constant colour or have lighting rigs in shot (Figure 51) by

forcing the alpha transparent. The inside mask can be used



Figure 51. Green Screen with lighting rig visible.

to keep elements in the foreground that you don't want to lose (an actor's blue eyes in front of a blue screen). These masks should normally be softened to blend into the Screen Matte.

Figure 52 on page 39 shows an After Effects's Mask drawn around the lighting rig on the left side of the screen. When this is used as the Outside Mask and the View control set to render the Outside Mask, you will see the image displayed in Figure 53. The outside mask forces that

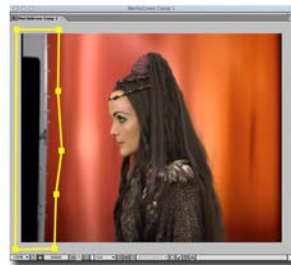


Figure 52. AE Mask drawn round the lighting rig.



Figure 53. AE Mask used as an Outside Mask and Viewed.

part of the image to be in the background thus keying out the rig. The Screen Matte shown in Figure 54 shows the



Figure 54. Screen Matte.



Figure 55. Combined Matte.

matte pulled when the green screen is picked. When the Outside Mask is subtracted from the Screen Matte we get the Combined Matte, shown in Figure 55. Here you can see the change in the matte that will result in the lighting rig being keyed out in the final composite. If more than one mask is required to remove garbage, then use the masks to create an embedded alpha channel in the image and set the Source Alpha to Normal. See “Source Alpha” on page 40.

## Source Alpha

This parameter determines how to deal with any embedded alpha in the original image.

- **Ignore** - this will not use any embedded alpha in the key.
- **Add to Inside Mask** - the embedded alpha is added to the inside mask.
- **Normal** - the embedded alpha is used to key the layer as normal. It is added to Keylight’s screen matte and can

be useful if requiring complicated multi-shaped masks to rotoscope out garbage.

## Colour Correction

The Colour Correction parameters allow you to modify the foreground colours in your composite. In particular, reflected blues and greens from the screen can be suppressed.

**Saturation** - this control will increase or decrease the colour saturation of the image, making colours more or less intense.

**Contrast** - the contrast is the ratio of brightest tones to the darkest. Increase this value for a contrasty image and decrease it to wash it out.

**Brightness** - the brightness equates to the overall luminance of the image. Increase this value to make the image lighter and decrease this value to make it darker.

## Colour Suppression

**Suppress** - this controls colour suppression in the image. You can choose to remove a specific primary, either Red, Green, Blue or their complements, Cyan, Magenta or Yellow. For green screens you may find it helpful to suppress green.

**Suppression Balance** - determines what to reduce the suppressed component to. If set to 0%, it will be the smallest of the other two components, if set to 100% it will be the largest of the other two components. Otherwise, it

will be to a balanced average.

**Suppression Amount** - determines how strongly you want to reduce the indicated component.

## Colour Balancing

These controls are used to alter the colour balance of the image. Choose a hue and saturation (either via the sliders or the colour balance wheel) to shift the entire colour balance of the image.

## Edge Correction

The Edge Correction parameters allow you to colour correct edges to seat the composite into the background. To see the areas considered an edge that you will be affecting, select the Colour Correction Edges from the View menu.

**Enable Edge Colour Correction** - use this option to separately colour correct edges of the image independently from the overall colour correction.

**Edge Hardness** - this determines how strongly to blend between the edge correction and the main correction.

**Edge Softness** - this will soften the region considered to be the edge by this amount (in pixels).

**Edge Grow** - this will grow the region considered to be the edge by this amount (in pixels).

**Saturation** - these controls determine how much to scale the saturation of the image.

**Contrast** - this control increases/decreases the contrast on the region considered to be the edge.

**Brightness** - this control brightens the region considered to be the edge.

### Edge Colour Suppression

Controls the colour suppression in the image.

**Suppress** - Choose to completely remove a specific primary, either Red, Yellow, Green, Blue or their components, Cyan, Magenta or Yellow.

**Suppression Balance** - determines what to reduce the suppressed component to. If set to 0%, it will be the smallest of the other two components, if set to 100% it will be the largest of the other two components. Otherwise, it will be to a balanced average.

**Suppression Amount** - determines how strongly you want to reduce the indicated component.

### Colour Balancing

These controls are used to alter the colour balance of the image edges. Choose a hue and saturation (either via the sliders or the colour balance wheel) to shift the entire colour balance of the image.

### Crops

The Source Crops enable you to quickly cut out lighting rigs or other unwanted elements using vertical and horizontal lines.

Keylight requires access to source pixels that lie off the edge of the source image. The cropping controls provide access to all the controls required for specifying how pixels are treated at these edges and where they appear. The built-in crop controls are also useful for removing unwanted black pixels at the edge of video footage.

**XY Method** - determines the behaviour of the image at the left and right crop boundaries. Four edge methods are supplied:

- **Colour** - fills the area between the crop line and the edge with the Crop Colour.
- **Reflect** - reflects pixels about the current crop line. In other words, it copies pixels from the other side of the current crop line into the area between the current crop line and the screen edge.
- **Repeat** - copies pixels on the crop boundary to the screen edge.
- **Wrap** - copies pixels from the area between the opposite crop line and its screen edge to the area between the current crop line and its screen edge.

*Note* Horizontal and vertical crop boundaries can have different edge methods, Cropping is often used to remove unwanted pixels at the edge of an image. If a video clip is digitized badly you may get black edges left and right. These can be easily removed by moving the vertical crops and setting the edge method to Reflect.

**Edge Colour** - sets the fill colour used when the edge method is set to Colour.

**Edge Colour Alpha** - sets the fill colour transparency.

**Left, Right, Top, Bottom** - use these controls to set the crop positions. Lines will be overlaid in the display enabling you to set the various positions by eye.

**Note** *The position of the crop lines can be changed by clicking and dragging them directly on the screen.*



# Tutorial

## Introduction

We have included four tutorials with example images that you can use to practice Keylight.

- Tutorial 1: Simple Key
- Tutorial 2: Fine Tuning a Key
- Tutorial 3: Extreme Blue Spill
- Tutorial 4: A Red Green Screen
- Tutorial 5: Inside & Outside Masks

## Example Images

The tutorial images referred to in this chapter can be downloaded from our web site [www.thefoundry.co.uk](http://www.thefoundry.co.uk)

From the home page click on the Downloads link then After Effects and scroll down for the tutorial images.

## Tutorial 1: Simple Key

Using the blue screen clip from The Saint, you will composite the actor over the background. You will learn how to:

- Apply Keylight to a layer.
- Pick the Screen Colour.
- View the Final Result.

The clips you will need for this task are called SaintFG.tif and SaintBG.tif, pictures courtesy of CFC and Paramount

British Pictures Ltd for the film *The Saint*. You should import them into After Effects and create a new composition containing the blue screen of Elizabeth Shue layered over the road.



Figure 56. Blue Screen - saint.tif

Figure 56 is the blue screen foreground that should be



Figure 57. Background - road.tif

composited over the background shown in Figure 57.

1. Create a new composition using SaintFG.tif and SaintBG.tif, layer the clips with the blue screen over the background as shown in Figure 58.

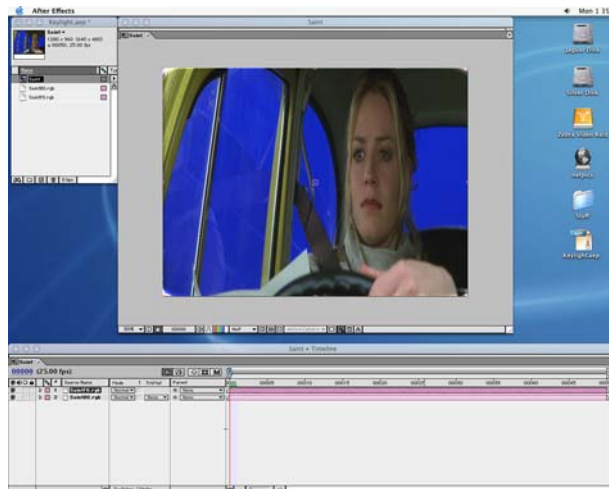


Figure 58. Screen Shot showing Saint blue screen.

2. Select the blue screen clip (SaintFG.tif) in the Time Layout window and apply Keylight from the Effect - Keying menu. See Figure 59.

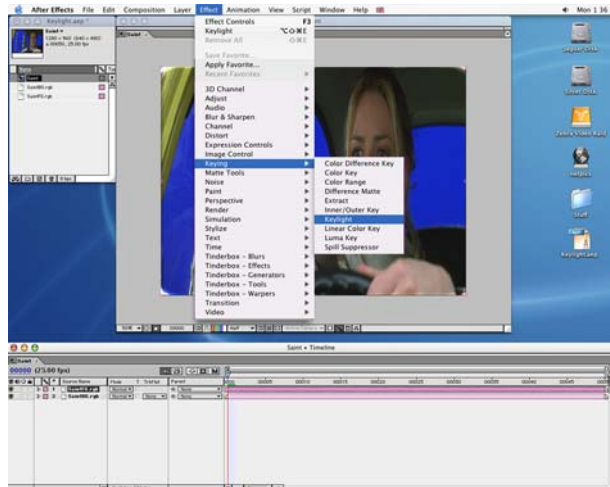


Figure 59. Apply Keylight from the Effect - Keying menu.

3. The Keylight parameters are shown in Figure 60.



Figure 60. Keylight Parameters

4. Select the Screen Colour eye dropper and click on the blue screen in the composition window. A good place to pick is the blue from



Figure 61. Pick the blue from the back windscreen.

the back windscreen as this has no reflections. See Figure 61.

5. That's it. In many cases this is all you will need to do to perform a key, since selecting the screen colour creates a matte and despill the foreground. The final composite is shown in Figure 62.



Figure 62. Final composite

There are a couple of extra steps that can be taken to fine tune this key and these are discussed in the next tutorial on page 52.

## Tutorial 2: Fine Tuning a Key

Using the images from the film *The Saint*, you will learn how to fine tune the key pulled in Tutorial 1. You will learn how to:

- Use Status to judge the quality of the key.
  - Use the Screen Strength to improve the background.
  - Use the Despill Bias to remove more blue spill.
1. Create a new composition using *SaintFG.tif* and *SaintBG.tif*. Apply Keylight to the blue screen layer. Select the Screen Colour eye dropper and click on the blue screen in the composition window.

**Note** *These steps were covered in greater detail in the previous chapter.*

2. Before we do anything else we need to look at the quality of the key so far. On first inspection, the composite looks pretty good, but it's hard to judge. To see any potential problems more clearly, switch to the Status view as shown in Figure 63. Here we can see that the

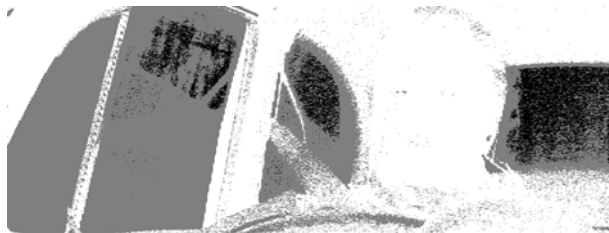


Figure 63. Status showing grey pixels in the background.

windcreens are a mixture of black and grey pixels. The black pixels tell us that pure background will be seen here in the final composite. The grey pixels tell us that there will be a mix of foreground and background pixels. What we want is a clean background showing through the windows, but with some reflections in the side window preserved. In other words we need mostly black pixels with a few grey ones.

3. Figure 64 on page 53 shows the Status view that we're aiming for. The background has been cleaned up and we still have some reflections in the side window. To get this you should increase the Screen Strength from 100 to 106.

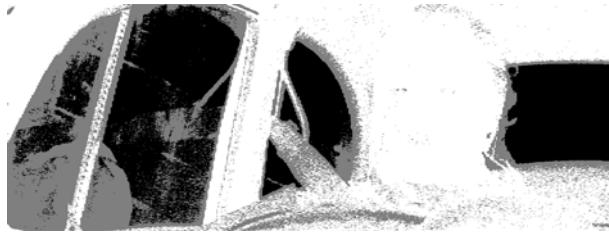


Figure 64. Improved background with Screen Strength.

4. Finally, if you look closely at the composite you will see a tiny amount of blue spill on the woman's hand and in her hair. This was from reflected light from the blue screen. By increasing the Despill Bias to 18 we can remove it. Use the Comparison Buffer to see the difference.



Figure 65. Final Composite

## Tutorial 3: Extreme Blue Spill

This is a really interesting clip from the film *Merlin*. The results with Keylight are certainly not perfect, indeed it is unlikely that you will ever end up with a truly realistic looking shot. However, there are some interesting things to observe. You will learn how to:

- Reduce the blue spill using Screen Balance and Despill Bias.
  - Improve the foreground opacity using Alpha Bias.
1. Load the *MerlinBlueFG.tif* (Figure 66) and *MerlinBlueBG.tif* clips and apply Keylight.



Figure 66. A tricky blue screen.

2. Pick the Screen Colour using the eye dropper.



Figure 67. Serious blue spill.

Pick a pure blue pixel away from the hair.

3. Increase the Screen Strength from 100 to 105. This will clean up a little of the background.
4. Alter the Screen Balance from 50 to 0 as shown in Figure 68. This step is a bit subjective, but improves the blue spill.



Figure 68. Adjust the Screen Balance

5. Now let's try and get rid of that blue spill. Increase the Despill Bias to 40. When you do this the image and the screen colour will have the blue component scaled up before the key is pulled so that more blue is removed. You will have noticed that the foreground has gone quite transparent. This can be compensated for by dropping the Alpha Bias. Un check the gang button and try setting it to 30.



Figure 69. Despill and Alpha Bias.

- You will notice that Miranda Richardson's face now has a number of highlights, due to the transparency, that we should fix. The best way to do this is by drawing a spline round the face (Figure 70)



Figure 70.

and using it as an Inside Mask. Refer to your After Effects guide for more information on masks, however, select the pen tool, draw a bezier spline around the face on frame 1 (Mask 1), switch this mask off (Figure 71) then in Keylight set the Inside Mask to Mask 1 and Source to None. You should also soften the mask slightly by setting

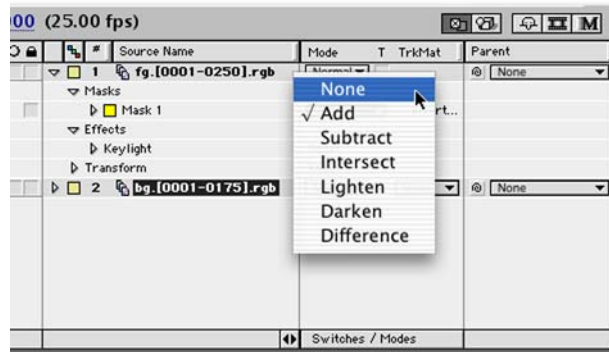


Figure 71. Switch the Mask off.

the Inside Mask Softness to 5.

7. View Final Result as shown in Figure 72.



Figure 72.

## Tutorial 4: A Red Green Screen

Using the images from the film *Executive Decision*, you will learn how to pull a key from a poor green screen using the Despill Bias control. You will learn how to:

- Pick the Screen Colour.
- Drop the Screen Bias.
- Produce a final composite.

The images you will need for this tutorial are called ExecFG.

1. Load the pictures ExecFG.tif (Figure 73) and ExecBG.tif. Apply Keylight. The foreground image is actually a green screen shot



Figure 73. Poor Green Screen.

although it doesn't look it. If you analyse the pixels it's slightly more red than green. To key this we'll have to fool Keylight.

2. Pick the Screen Colour. You should go for the slightly darker green patch to the left of the pilot. Although feel free to experiment

picking different parts of the green screen. The initial selection gives the result shown in Figure 74.



Figure 74. Default key.

3. To fix this we need to tell Keylight to scale down the red component to make the green the most dominant so that it keys correctly. To do this decrease the Despill Bias to -20. The result is shown in Figure 75.



Figure 75. Decrease the Despill Bias.

4. If you look closely, the background and foreground needs cleaning up. Figure 76 shows the Status View. We will use the Screen Matte

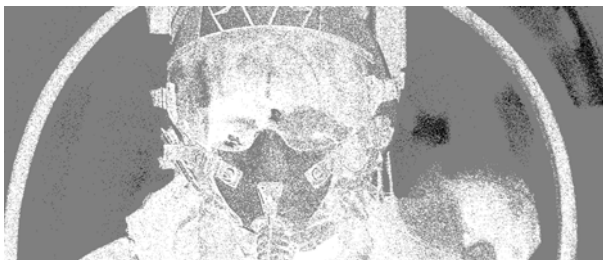


Figure 76. Status View.

tools to make the cockpit windows black and the pilot white.

5. Increase Clip Black to 20 to remove some of the foreground showing through the background. Decrease Clip White to 70 to improve the opacity of the foreground. Increase Screen Softness to 1, Screen Despot Black to 2 and Screen Despot White to 2.

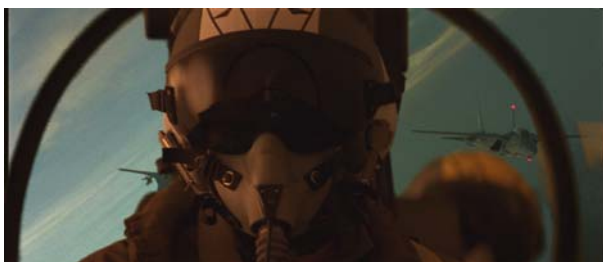


Figure 77. Composite.

6. Use the Screen Matte Replace Method to pull some of the original image through the composite. This improves the apparent graininess in the foreground. Figure 78 shows the differences.



Figure 78. Close up view. The left image has Replace Method set to Source. The right image has Replace Method set to None.

## Tutorial 5: Inside & Outside Masks

Using the 16 bit blue screen test card image you will learn how to:

- Use Inside and Outside Masks.
- Use the Replace Method to put back keyed out colours.
- Process the Screen Matte.

The clips you will need for this task are called `TestCard.cin` and `ColourGrid.cin`

1. Start After Effects. Create a new 16 bit project. Load the pictures `TestCard.cin` (Figure 79) and `ColourGrid.cin` and put them into the



Figure 79. Test Card.

composition layering the blue screen over the colour grid.

2. Apply Keylight to the blue screen layer and pick the blue from the image. Keylight will create a matte and despill the foreground as



Figure 80. Basic Key.

shown in Figure 80.

3. To remove the garbage around the subject we will use an outside mask. Using AE's masks, draw a spline around the person and test cards. This will be called Mask 1 by default. This is shown as the yellow line in Figure 81. In the Time Layout window twirl open the

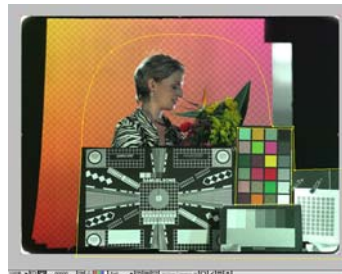


Figure 81. Outside Mask.

TestCard layer and Masks sub-layer and set the compositing mode from Add to None.

4. In Keylight, set the Outside Mask to Mask 1 and switch Invert on or



Figure 82.

you'll be removing the person rather than the unwanted pixels at the screen edges.

5. You will have noticed in Figure 82 the "dirt" around the subject's



Figure 83.

head. Clearly we have to improve the key. You can also see the faults in the matte if you view the Status as shown in Figure 83.

6. Increase the Screen Strength to 110. This cleans up some of the background as shown in Figure 84.



Figure 84. Increase Screen Strength.

7. Sections 7 to 10 will cover the changes to the Screen Matte that will improve the key. In the Screen Matte parameter area, decrease the Clip White from 100 to 70. This will improve the foreground as



Figure 85. Clip White.

shown in Figure 85. However, you will notice in the composite that the edges have become a little hard. We can fix this using the Clip Rollback and Screen Softness.

8. Increase the Clip Rollback to 3 and the Screen Softness to 1. It's

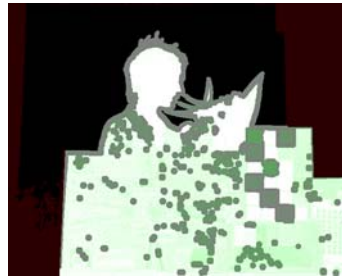


Figure 86.

also worth trying to improve the key around the spikey flowers with a sub-pixel erode of the edge. Change Screen Grow/Shrink to -0.5.

9. To remove the foreground spots increase Screen Despot Black to 1.



Figure 87. Screen Despot Black.

The result is shown in Figure 87.

10. The composite is shown in Figure 88. You will see that the colours of the colour swatches have been altered by the Keylight algorithm. This can be fixed with an inside mask.



Figure 88. Composite.

11. Draw a rough mask (Mask 2) around just the colour swatches. Set



Figure 89. Inside Mask and Replace Method Source.

the Inside Mask to Mask 2 and the Replace Method to Source to pull back the original colours.

12. That's it.



# Appendix A

## Release Notes

This appendix describes the requirements, new features, improvements over previous versions, fixed bugs and known bugs and workarounds in Keylight.

## Keylight 1.0v4

This is a maintenance release to fix a bug.

### Requirements

Adobe After Effects 6.0 or 6.5 Professional on Mac OS X or PC.

### Release Date

8 September 2003

### New Features

There are no new features.

### Improvements

1. Installer for Mac OS X changed to standard pkg format. Plug-ins remain the same.

### Fixed Bugs

1. BUG 354. On PC only, on selecting Edit>Purge>All After Effects will crash. This has been fixed in this release.

### Known Bugs and Workarounds

There are no known bugs.

## Keylight 1.0v3

This version is the full release and is supplied on the Adobe After Effects 6.0 Professional CD.

### Requirements

Adobe After Effects 6.0 Professional on Mac OS X or PC.

### New Features

There are no new features.

### Improvements

There are no new features.

### Fixed Bugs

1. During a Keylight render, if a redraw of the After Effects user interface occurs, possibly due to a screen saver or window stowing, this may cause Keylight to crash. This bug has been fixed.
2. BUG 346. If Keylight was copied and pasted between compositions, After Effects will crash. This has been fixed.

### Known Bugs and Workarounds

There are no known bugs.

## Keylight 1.0v2

### Requirements

Adobe After Effects 6.0 Professional on Mac OS X or PC.

### New Features

There are no new features.

### Improvements

1. A new parameter, "Normal", has been added to the Source Alpha menu to allow embedded alpha to key the layer as normal. This allows multi-shape masks to be used as garbage mattes.

### **Fixed Bugs**

There are no fixed bugs.

### **Known Bugs and Workarounds**

There are no known bugs.

## **Keylight 1.0v1**

### **Requirements**

Adobe After Effects 6.0 Professional on Mac OS X or PC.

### **New Features**

This section will describe new features in later versions.

### **Improvements**

This section will describe improvements to existing features in later versions.

### **Fixed Bugs**

This section will describe fixed bugs in later versions.

### **Known Bugs and Workarounds**

There are no known bugs.



## Appendix B

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