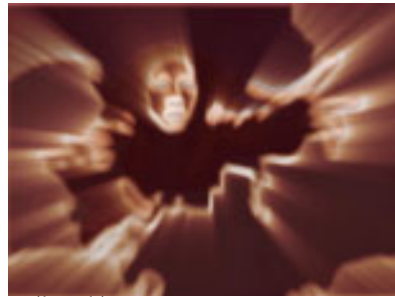


## BCC Rays Cartoon Filter

The BCC Rays Cartoon filter creates the light out of the Cartoon edges of the filter. Using it is the same as using one of the other Rays filters with the Light From channel set to one of the Cartoon Edges choices.



Source image



Filtered image

The **Cartoon From** menu determines which source color channel is used to create the edges and to calculate the intensities of the source pixels. Pixels with higher values in the chosen channel are considered to have higher intensities.

- *Luma, Red, Green* and *Blue* use the corresponding color channel and multiply it by the source alpha channel.
- *Alpha* uses the unmodified corresponding source alpha channel. If the source does not include an alpha channel, this option produces no light.
- *PixelChooser* uses the region defined in the PixelChooser.

**Line Thickness** adjusts the thickness and intensity of the edges.

**Smooth Details** blurs the source image before the filter searches for edges. This blur does not appear in the output; it is used only in edge detection.

**Cartoon Threshold** sets the value in the threshold above which pixels are treated as fully on.

The **Light over Edges** checkbox composites the light over the edges, when the Apply Mode is set to something other than *None*. If the Apply Mode menu is set to *None*, enabling this checkbox will treat the Apply Mode menu as if it set to *In Front*.

**Edge Color** sets the edge light color.

The **Light Source** position points set the location of the simulated light source on the X and Y axis.

**Intensity** adjusts the intensity of the light source.

**Ray Length** controls the length of the rays of light that emanate from the source. Ray Length also affects controls in the Custom Look group if the Look menu is not set to Custom.

The **Ray Style** menu determines what type of rays are created. The choices are *Detailed* and *Fat*. Detailed produces rays that retain a great deal of detail as they spread from the Light Source. Fat produces less distinct rays. Fat Style produces rays similar to those produced by the Light Zoom filter.

The **Look menu** determines a look for the rays in the effect. The choices are *Default*, *Custom*, *Extended 1*, *Extended 2*, *Extended Bloom*, *Extend and Contract*, *Tight*, *Tight and Extend* and *Tight Bloom*. The *Default* setting gives the best look for each particular filter, so its effect varies from filter to filter. When Custom is chosen, you can use the controls in the Custom Look parameter group to finetune the rays. See “Custom Look Parameter Group” below.

### Custom Look Parameter Group

The controls in the Custom Look parameter group allow you to customize and finetune the light rays precisely when the Look menu is set to Custom. If the Look menu is not set to Custom, these controls have no affect. The Default Look simply sets all of the Custom Look controls to their default values for the filter, so switching between Default and Custom has no affect until the Custom Look parameters are adjusted.

**Extend Rays** allows you to extends the rays by favoring light pixels over dark.

**Contract Rays** contracts the rays. While this may seem to be the opposite of Extend Rays, this parameter adjusts the algorithm differently, so increasing Contract Rays is not the same as decreasing Extend Rays.

**Holdout Radius** determines where the rays of light start in relation to the light source. Positive values create a circular region centered around the light source beyond which the rays emanate. Attenuation does not begin until after the radius is reached. Decreasing negative values cause the attenuation to start closer to the light source point.

The **Color menu** determines how the applied light affects the source image. You can also use this menu to preview the source channel used by the filter to create the effect.

- *Colorize* converts the light to colors using the controls in the Colorize Controls Parameter Group.
- *Image* produces a colored lighting effect using color information from the image that the filter is applied to.
- *Light Matte* uses the applied light to modify or create an alpha channel and displays a grayscale matte.
- *Inverse Light Matte* works similarly to Light Matte, but inverts the result.
- *Alpha* uses the applied light to modify or create an alpha channel and uses it to composite the source image.
- *View Source* displays the chosen Light From Channel (the source channel used by the filter to create the effect). This can be especially useful if you are using edges in the image as the Light From Channel.

The **Color Source Layer menu** sets the layer used when the Color menu is set to Image.

### Working with the Color Preset Menu

The **Color Preset menu** allows you to choose a Colorize preset (a gradient of up to six colors to tone the light rays). If the Mode menu is not set to Colorize, the presets have no affect.

## Colorize Controls Parameter Group

When the **Color menu** is set to *Colorize*, the parameters in this group allow you to use a gradient of up to six colors to tone the light rays. Alternatively, you can conveniently choose a stored gradient without opening the Colorize Controls group by choosing a preset from the Color Preset menu. The **Gradient** displays a preview of the gradient that you create.

All of the parameters in this section can be animated. If the Color menu is not set to Colorize, the parameters in this tab are disabled.

The **Color Space menu** determines whether the gradient is created in *RGB*, *HSL*, or *HSV* color space. Choose HSL or HSV if you want to animate the colors in the gradient while maintaining the level of saturation.

The **Color 1**, **Color 2**, **Color 3**, **Color 4**, **Color 5**, and **Color 6** controls choose six different colors to add to the gradient.

Color 1 and Color 6 are always used. Each of the remaining colors has a **Color On checkbox**. Select this option to add the corresponding color to the gradient. Deselect this option to remove the corresponding color from the gradient.

**Black Point** adjusts the value in the Input Channel which is treated as the pure Color 1 level in the output. All pixels whose Input Channel value is lower than the Black Point value are mapped to the Color 1 color. Increasing positive Black Point values cause more pixels to be purely Color 1 in the output. Decreasing negative values cause fewer pixels to be purely Color 1. The following illustrations show the affect of adjusting the Black Point with a simple two-color gradient from black (Color 1) to white (Color 6).

**White Point** adjusts the value in the Input Channel which is mapped to the pure Color 6 in the output. Increasing White Point causes more pixels to be purely Color 6 in the output.

Negative **Squeeze** values compress and shift the gradient towards the left (Color 1) side. Increasing positive values compress and shift the gradient towards the right (Color 6) side.

The **Loop menu** affects the output when either Loop Count or Gradient Offset are changed from their default values.

- When **Off** is chosen, looping past the end of the gradient uses the end color. This is the default value.
- When you choose **Forward Loop** the gradient loops back to **Color 1** after it passes **Color 6**. You can increase **Loop Count** to set the number of loops or change **Gradient Offset** to move the mapping through this loop.
- When you choose **Back & Forth Loop**, the color mapping goes from 1 to 6 to 6 to 1, etc.

**Loop Count** sets the number of times that the gradient loops. Values less than one use less of the gradient; negative values loop backwards, which only has a different appearance from a positive value if **Gradient Offset** is not zero.

**Gradient Offset** offsets the starting point of the gradient. This can be animated to create palette-shifting effects. A value of 100 offsets the gradient by one full cycle. Since the gradient loops back and forth, setting Gradient Offset to 100 or 300 simply reverses the direction of the gradient.

**Hue** cycles the colors in the gradient around the color wheel in the HSL color space.

**Saturation** adjusts the intensity of each color's hue in the gradient. Negative values desaturate the gradient, while positive values increase the saturation of the gradient.

The **Apply Mode menu** controls how the filter composites the applied light with the image.



For information on the available apply modes, see Appendix A in the User Guide.

### Composite Parameter Group

This parameter group determine how the light is composited over the underlying image. These controls are only active when either Colorize or Use Source Color are chosen as the Light Mode menu.

**Source Threshold** subtracts the threshold from each pixel value when computing the light.

**Light Threshold** sets a value that is subtracted from the light at each pixel before it is applied. If you are animating the position of an object, increasing Light Threshold causes the light to fade out more rapidly as you move away from the source image.

**Source Opacity** adjusts the opacity of the source image in the final composite. Setting source Opacity to 0 has the same effect as setting Apply Mode to None.

**Light Opacity** controls the opacity of the light as it is composited over the source image. This parameter can be overdriven.

Many hosts process media one field at a time which can cause flickering to occur on filtered effects. The **Reduce Flicker menu** allows you to reduce flicker in the rendered image. The only way to evaluate a deflicker setting is to render and play back the effect on an NTSC monitor. Choose from the following options in the Reduce Flicker menu.

- **1-2-1** mixes each pixel with the pixels above and below it, with the input pixel getting twice the weight as the ones above and below. For After Effects users, this works the same as applying the AE Reduce Flicker filter at a setting of 0.5.
- **2-3-2** provides more softening than 1-2-1.
- **1-1-1** provides the most softening for effects that still contain flicker with the above options.
- **Off** is the default. If Off is chosen, no deflickering will be done.

**Mix with Original** blends the source and filtered images. Use this parameter to animate the effect from the unfiltered to the filtered image without adjusting other settings, or to reduce the effect of the filter by mixing it with the source image.

### Working with the Light From Menu

The **Light From menu** determines which source color channel is used to create the light and to calculate the intensities of the source pixels. Pixels with higher values in the selected channel are considered to have higher intensities.

- **Luma, Red, Green, and Blue** use the corresponding color channel and multiply it by the source alpha channel.
- **Luma Inverse** uses the inverted luma channel to make the light.

- *Unmultiplied Luma* and *Alpha* use the unmodified corresponding source channels.
- *Luma Cartoon Edges* and *Alpha Cartoon Edges* find edges in the corresponding source channel, apply outlines to the edges, and use the resulting image. When *Luma Cartoon Edges* or *Alpha Cartoon Edges* is chosen, **Thickness/Intensity** adjusts the width of the outlined edges, and **Cartoon Threshold** sets the value in the threshold above which pixels are considered fully on.
- *Luma Edges* and *Alpha Edges* find edges in the corresponding source channel and use the resulting image. When *Luma Edges* or *Alpha Edges* is chosen, **Thickness/Intensity** adjusts the intensity of the edges, and **Edge Floor** adjusts the sensitivity of the filter when searching for edges in the source. Lower values increase sensitivity.
- When *PixelChooser* is chosen, the *PixelChooser* setting determines how the edges are created.

### Texture Menu and Texture Controls Parameter Group

These parameters allow you to set and finetune a light texture. The Texture menu and Texture Intensity control appear in a parameter group above the Texture Controls Parameter Group.

Two kinds of texture can be implemented, *Strings* and *Shimmer*.

The **Texture menu** allows you to select any combination of Shimmer and Strings. The options are *Strings*, *Contracted Strings*, *Shimmer*, *Shimmer and Strings*, *Shimmer and Contracted Strings* and *Off*. When *Off* is chosen, no texture is applied. The *Shimmer* controls create a texture that depends on the angle of the line from each point of the image to the light source. The *Strings* controls cause noise to affect the amount of attenuation the light rays experience as the emanate from the source and interact with the pixels they cross.

**Texture Intensity** scales the selected textures. You can create a basic textured look by selecting one of the texture settings and adjusting its intensity. You can then finetune its look by adjusting the parameters in the Texture Controls Group.

**Stringiness** controls the intensity of the texture when the Texture menu is set to one of the Strings options.

**String Softness** controls the softness applied to the string texture.

**String Seed** determines the value input to the random number used by the filter to adjust the strings. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the strings.

**String Morph Rate** controls the rate at which the strings evolve over time. This parameter can be animated, so you can animate from evolving strings to static strings.

**Shimmer Intensity** controls the intensity of the texture when the Texture menu is set to one of the shimmer options.

**Shimmer Detail** adjusts the amount of detail in the shimmer.

**Shimmer Rotate** rotates the shimmer pattern.

**Shimmer Seed** determines the value input to the random number used by the filter to adjust the shimmer. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the shimmer.

**Shimmer Morph Rate** controls the rate at which the Shimmer pattern evolves over time.

**Expand Source %** allows you to expand the rays outside the outside edges of the image.

### **Motion Tracker Parameter Group**

The Motion Tracker parameter group allows you to track the motion of an object, then use the motion data to control another aspect of the effect. In most of the Rays filters, you can apply the motion tracker data to the *Light Source* or to the *PixelChooser*. In the Rays Radiant Spotlight filter, you can also apply the data to the *Light Target*. For example, apply the Rays Radiant Spotlight filter and track a face in a crowd. Use the Light Target parameters to apply the spotlight to highlight the person's face. For more information, see Chapter One in the User Guide.

### **PixelChooser, PC Region and PC Matte Parameter Groups**

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image. For details on the PixelChooser controls, see the User Guide. The Rays filters' PixelChooser includes an additional parameter that appears in the PixelChooser parameter group.

The **PixelChooser Target menu** sets which parameters are affected by the PixelChooser.

- Choosing *Light* scales down the light level at each point in the effect.
- *Mix* makes the PixelChooser behave in the same way that it does in most filters – it mixes the original image with the filtered image.
- *Source Light* scales down the intensity of each pixel as it interacts with the rays crossing it, making the image darker.
- *Attenuation* scales the attenuation at each point where pixels are not fully chosen. This tends to make the rays shorter. You can stop the rays in an unchosen region and pick them up again in the chosen region.
- *Attenuation Boost* creates the reverse of Attenuation; rays travel further in unchosen regions.
- *Off* turns off these options.

## BCC Rays Radiant Spotlight Filter

The BCC Rays Radiant Spotlight filter is a combination of a Light Ray Filter and a Spotlight. The spotlight can be used to matte either the light source or the rendered light.



Source image



Filtered image

The **Spotlight menu** determines the use for the spotlight.

- **Bloom** uses the spotlight to matte the light source.
- **Matte** uses the spotlight to matte the rendered light.
- **View** lets you view the spotlight without the underlying image.
- **Off** turns the spotlight off and displays only the light rays.



Spotlight=Bloom



Spotlight=Matte



Spotlight=View

The **Spotlight Source** controls set the location of the simulated spotlight source.

The **Spotlight Target** controls set the location of the spotlight target.

**Light Source** positions the source of the light rays on the axis from the **Spotlight Source** to the **Spotlight Target**. One way to think of Light Source is a line between the Spotlight Source and the Spotlight Target. Adjusting the Light Source control moves the light source along this line. A setting of **0** places the source of the light source at the Spotlight source, and a setting of **300** places it at the target.



*Light Source=0*



*Light Source=100*

### **Spotlight Controls Parameter Group**

**Spotlight Elevation** controls the height of the light source above the image plane. The portion of the image that is lit is either an ellipse or a hyperbola, depending on the angle at which the beam of light strikes the image. The shape of the lit region is determined by the Spotlight Elevation and the distance between the Light Source and Target points. Reducing Spotlight Elevation produces an increasingly stretched ellipse, or a hyperbola, and moves the center of the lit region farther from the Target point. Increasing Spotlight Elevation produces an increasingly circular lit region.

**Spotlight Width** controls the width (in degrees) of the cone that defines the edge of the light as it spreads from the light source in three dimensions. Changing the Spotlight Width is analogous to altering the placement of a physical spotlight within its enclosure.

**Spotlight Softness** sets the softness of the spotlight.

**Spotlight Intensity** sets the intensity of the spotlight.

**Ambient Light** Ambient light allows light through the matte created by the spotlight. Setting ambient light to 100 is equivalent to setting Spotlight Mode to Off.

**Intensity** adjusts the intensity of the light source.

**Ray Length** controls the length of the rays of light that emanate from the source. Ray Length also affects controls in the Custom Look group if the Look menu is not set to Custom.

The **Ray Style** menu determines what type of rays are created. The choices are *Detailed* and *Fat*. Detailed produces rays that retain a great deal of detail as they spread from the Light Source. Fat produces less distinct rays. Fat Style produces rays similar to those produced by the Light Zoom filter.

The **Ray Style menu** determines what type of rays are created. The choices are *Detailed* and *Fat*. Detailed produces rays that retain a great deal of detail as they spread from the Light Source. Fat produces less distinct rays. Fat Style produces rays similar to those produced by the Light Zoom filter.

The **Look menu** determines a look for the rays in the effect. The choices are *Default*, *Custom*, *Extended 1*, *Extended 2*, *Extended Bloom*, *Extend and Contract*, *Tight*, *Tight and Extend* and *Tight Bloom*. The *Default* setting gives the best look for each particular filter, so its effect varies from filter to filter. When Custom is chosen, you can use the controls in the Custom Look parameter group to finetune the rays. See “Custom Look Parameter Group” below.

### **Custom Look Parameter Group**

The controls in the Custom Look parameter group allow you to customize and finetune the light rays precisely when the Look menu is set to Custom. If the Look menu is not set to Custom, these controls have no affect. The Default Look simply sets all of the Custom Look controls to their default values for the filter, so switching between Default and Custom has no affect until the Custom Look parameters are adjusted.

**Extend Rays** allows you to extends the rays by favoring light pixels over dark.

**Contract Rays** contracts the rays. While this may seem to be the opposite of Extend Rays, this parameter adjusts the algorithm differently, so increasing Contract Rays is not the same as decreasing Extend Rays.

**Holdout Radius** determines where the rays of light start in relation to the light source. Positive values create a circular region centered around the light source beyond which the rays emanate. Attenuation does not begin until after the radius is reached. Decreasing negative values cause the attenuation to start closer to the light source point.

The **Color menu** determines how the applied light affects the source image. You can also use this menu to preview the source channel used by the filter to create the effect.

- *Colorize* converts the light to colors using the controls in the Colorize Controls Parameter Group.
- *Image* produces a colored lighting effect using color information from the image that the filter is applied to.
- *Light Matte* uses the applied light to modify or create an alpha channel and displays a grayscale matte.
- *Inverse Light Matte* works similarly to Light Matte, but inverts the result.
- *Alpha* uses the applied light to modify or create an alpha channel and uses it to composite the source image.
- *View Source* displays the chosen Light From Channel (the source channel used by the filter to create the effect). This can be especially useful if you are using edges in the image as the Light From Channel.

The **Color Source Layer menu** sets the layer used when the Color menu is set to Image.

## Working with the Color Preset Menu

The **Color Preset menu** allows you to choose a Colorize preset (a gradient of up to six colors to tone the light rays). If the Mode menu is not set to Colorize, the presets have no affect.

## Colorize Controls Parameter Group

When the **Color menu** is set to *Colorize*, the parameters in this group allow you to use a gradient of up to six colors to tone the light rays. Alternatively, you can conveniently choose a stored gradient without opening the Colorize Controls group by choosing a preset from the Color Preset menu. The **Gradient** displays a preview of the gradient that you create.

All of the parameters in this section can be animated. If the Color menu is not set to Colorize, the parameters in this tab are disabled.

The **Color Space menu** determines whether the gradient is created in *RGB*, *HSL*, or *HSV* color space. Choose HSL or HSV if you want to animate the colors in the gradient while maintaining the level of saturation.

The **Color 1**, **Color 2**, **Color 3**, **Color 4**, **Color 5**, and **Color 6** controls choose six different colors to add to the gradient.

Color 1 and Color 6 are always used. Each of the remaining colors has a **Color On checkbox**. Select this option to add the corresponding color to the gradient. Deselect this option to remove the corresponding color from the gradient.

**Black Point** adjusts the value in the Input Channel which is treated as the pure Color 1 level in the output. All pixels whose Input Channel value is lower than the Black Point value are mapped to the Color 1 color. Increasing positive Black Point values cause more pixels to be purely Color 1 in the output. Decreasing negative values cause fewer pixels to be purely Color 1. The following illustrations show the affect of adjusting the Black Point with a simple two-color gradient from black (Color 1) to white (Color 6).

**White Point** adjusts the value in the Input Channel which is mapped to the pure Color 6 in the output. Increasing White Point causes more pixels to be purely Color 6 in the output.

Negative **Squeeze** values compress and shift the gradient towards the left (Color 1) side. Increasing positive values compress and shift the gradient towards the right (Color 6) side.

The **Loop menu** affects the output when either Loop Count or Gradient Offset are changed from their default values.

- When **Off** is chosen, looping past the end of the gradient uses the end color. This is the default value.
- When you choose **Forward Loop** the gradient loops back to **Color 1** after it passes **Color 6**. You can increase **Loop Count** to set the number of loops or change **Gradient Offset** to move the mapping through this loop.
- When you choose **Back & Forth Loop**, the color mapping goes from 1 to 6 to 6 to 1, etc.

**Loop Count** sets the number of times that the gradient loops. Values less than one use less of the gradient; negative values loop backwards, which only has a different appearance from a positive value if **Gradient Offset** is not zero.

**Gradient Offset** offsets the starting point of the gradient. This can be animated to create palette-shifting effects. A value of 100 offsets the gradient by one full cycle. Since the gradient loops back and forth, setting Gradient Offset to 100 or 300 simply reverses the direction of the gradient.

**Hue** cycles the colors in the gradient around the color wheel in the HSL color space.

**Saturation** adjusts the intensity of each color's hue in the gradient. Negative values desaturate the gradient, while positive values increase the saturation of the gradient.

The **Apply Mode menu** controls how the filter composites the applied light with the image.



For information on the available apply modes, see Appendix A in the User Guide.

### Composite Parameter Group

This parameter group determine how the light is composited over the underlying image. These controls are only active when either Colorize or Use Source Color are chosen as the Light Mode menu.

**Source Threshold** subtracts the threshold from each pixel value when computing the light.

**Light Threshold** sets a value that is subtracted from the light at each pixel before it is applied. If you are animating the position of an object, increasing Light Threshold causes the light to fade out more rapidly as you move away from the source image.

**Source Opacity** adjusts the opacity of the source image in the final composite. Setting source Opacity to 0 has the same effect as setting Apply Mode to None.

**Light Opacity** controls the opacity of the light as it is composited over the source image. This parameter can be overdriven.

Many hosts process media one field at a time which can cause flickering to occur on filtered effects. The **Reduce Flicker menu** allows you to reduce flicker in the rendered image. The only way to evaluate a deflicker setting is to render and play back the effect on an NTSC monitor. Choose from the following options in the Reduce Flicker menu.

- **1-2-1** mixes each pixel with the pixels above and below it, with the input pixel getting twice the weight as the ones above and below. For After Effects users, this works the same as applying the AE Reduce Flicker filter at a setting of 0.5.
- **2-3-2** provides more softening than 1-2-1.
- **1-1-1** provides the most softening for effects that still contain flicker with the above options.
- **Off** is the default. If Off is chosen, no deflickering will be done.

**Mix with Original** blends the source and filtered images. Use this parameter to animate the effect from the unfiltered to the filtered image without adjusting other settings, or to reduce the effect of the filter by mixing it with the source image.

The **Light From menu** determines which source color channel is used to create the light and to calculate the intensities of the source pixels. Pixels with higher values in the selected channel are considered to have higher intensities.

- *Luma*, *Red*, *Green*, and *Blue* use the corresponding color channel and multiply it by the source alpha channel.
- *Luma Inverse* uses the inverted luma channel to make the light.
- *Unmultiplied Luma* and *Alpha* use the unmodified corresponding source channels.
- *Luma Cartoon Edges* and *Alpha Cartoon Edges* find edges in the corresponding source channel, apply outlines to the edges, and use the resulting image. When *Luma Cartoon Edges* or *Alpha Cartoon Edges* is chosen, **Thickness/Intensity** adjusts the width of the outlined edges, and **Cartoon Threshold** sets the value in the threshold above which pixels are considered fully on.
- *Luma Edges* and *Alpha Edges* find edges in the corresponding source channel and use the resulting image. When *Luma Edges* or *Alpha Edges* is chosen, **Thickness/Intensity** adjusts the intensity of the edges, and **Edge Floor** adjusts the sensitivity of the filter when searching for edges in the source. Lower values increase sensitivity.
- When *PixelChooser* is chosen, the *PixelChooser* setting determines how the edges are created.

### Edges Parameter Group

The Edges Parameter group provides additional control if either *Alpha Edges*, *Luma Edges*, *Alpha Cartoon Edge* or *Luma Cartoon Edges* is chosen in the **Light From menu**. If any of the other settings are chosen, the parameters in this section have no affect.

When the **Light From menu** is set to *Alpha Edge* or *Luma Edges*, **Thickness/Intensity** controls the intensity of the edges. When the **Light From menu** is set to *Alpha Cartoon Edge* or *Luma Cartoon Edges*, **Thickness/Intensity** adjusts the thickness of the outside edges.

**Smooth Details** blurs the source image before the filter searches for edges. This blur does not appear in the output; it is used only in edge detection. This parameter only works if the **Light From menu** is set to *Luma Edges*, *Alpha Edges*, *Luma Cartoon Edges* or *Alpha Cartoon Edges*.

**Bloom** blurs the edges before they are used to create the applied light. This parameter only works if the **Light From menu** is set to *Luma Edges*, *Alpha Edges*, *Luma Cartoon Edges* or *Alpha Cartoon Edges*. The following example shows Light from Luma Edges.

**Cartoon Threshold** sets the value in the threshold above which pixels are considered fully on. This parameter is only available if the **Light From menu** is set to *Luma Cartoon Edges* or *Alpha Cartoon Edges*.

### Texture Menu and Texture Controls Parameter Group

These parameters allow you to set and finetune a light texture. The Texture menu and Texture Intensity control appear in a parameter group above the Texture Controls Parameter Group.

Two kinds of texture can be implemented, *Strings* and *Shimmer*.

The **Texture menu** allows you to select any combination of Shimmer and Strings. The options are *Strings*, *Contracted Strings*, *Shimmer*, *Shimmer and Strings*, *Shimmer and Contracted Strings* and *Off*. When *Off* is chosen, no texture is applied. The *Shimmer*

controls create a texture that depends on the angle of the line from each point of the image to the light source. The *Strings* controls cause noise to affect the amount of attenuation the light rays experience as they emanate from the source and interact with the pixels they cross.

**Texture Intensity** scales the selected textures. You can create a basic textured look by selecting one of the texture settings and adjusting its intensity. You can then finetune its look by adjusting the parameters in the Texture Controls Group.

**Stringiness** controls the intensity of the texture when the Texture menu is set to one of the Strings options.

**String Softness** controls the softness applied to the string texture.

**String Seed** determines the value input to the random number used by the filter to adjust the strings. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the strings.

**String Morph Rate** controls the rate at which the strings evolve over time. This parameter can be animated, so you can animate from evolving strings to static strings.

**Shimmer Intensity** controls the intensity of the texture when the Texture menu is set to one of the shimmer options.

**Shimmer Detail** adjusts the amount of detail in the shimmer.

**Shimmer Rotate** rotates the shimmer pattern.

**Shimmer Seed** determines the value input to the random number used by the filter to adjust the shimmer. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the shimmer.

**Shimmer Morph Rate** controls the rate at which the Shimmer pattern evolves over time.

**Expand Source %** allows you to expand the rays outside the outside edges of the image.

### Motion Tracker Parameter Group

The Motion Tracker parameter group allows you to track the motion of an object, then use the motion data to control another aspect of the effect. In most of the Rays filters, you can apply the motion tracker data to the *Light Source* or to the *PixelChooser*. In the Rays Radiant Spotlight filter, you can also apply the data to the *Light Target*. For example, apply the Rays Radiant Spotlight filter and track a face in a crowd. Use the Light Target parameters to apply the spotlight to highlight the person's face. For more information, see Chapter One in the User Guide.

### PixelChooser, PC Region and PC Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image. For details on the PixelChooser controls, see the User Guide. The Rays filters' PixelChooser includes an additional parameter that appears in the PixelChooser parameter group.

The **PixelChooser Target menu** sets which parameters are affected by the PixelChooser.

- Choosing *Light* scales down the light level at each point in the effect.

- *Mix* makes the PixelChooser behave in the same way that it does in most filters – it mixes the original image with the filtered image.
- *Source Light* scales down the intensity of each pixel as it interacts with the rays crossing it, making the image darker.
- *Attenuation* scales the attenuation at each point where pixels are not fully chosen. This tends to make the rays shorter. You can stop the rays in an unchosen region and pick them up again in the chosen region.
- *Attenuation Boost* creates the reverse of Attenuation; rays travel further in unchosen regions.
- *Off* turns off these options.

## BCC Rays Ring Filter

The BCC Rays Ring filter masks the light source with a ring. The resulting light is generated from a selected channel in the source image and spreads from a source point in all directions.



*Source image*



*Filtered image*

The **Ring** menu determines the type of ring light that is created.

- *On* creates a hollow donut-shaped ring of light.
- *Inverse* Inverts the donut-shaped ring of light.
- *Inside Only* or *Outside Only* create a mask with the ring of light.
- *View* displays a black and white matte of the ring in which fully selected pixels are black and fully unselected pixels are white. This is useful for adjusting the ring.
- *Off* disables the display of the ring. When you select Off, the resulting light rays display unmasked by the ring.



*Ring=On*



*Ring=Inverse Ring*



*Ring=Inside Only*



*Ring=View*

**Ring Scale** sets the scale of the ring.

**Ring Aspect** determines the aspect of the ring. Higher positive values create a horizontal oval ring while negative values create a vertical oval shaped ring. The default value of 0 creates a round ring.

### **Ring Controls Parameter Group**

**Ring Radius** controls the radius of the ring.

**Ring Thickness** controls the thickness of the ring.

**Ring Softness** controls set the softness of the ring.

The **Light Source** position point sets the location of the simulated light source on the X and Y axis.

**Intensity** adjusts the intensity of the light source.

**Ray Length** controls the length of the rays of light that emanate from the source. Ray Length also affects controls in the Custom Look group if the Look menu is not set to Custom.

The **Ray Style menu** determines what type of rays are created. The choices are *Detailed* and *Fat*. Detailed produces rays that retain a great deal of detail as they spread from the Light Source. Fat produces less distinct rays. Fat Style produces rays similar to those produced by the Light Zoom filter.

The **Look menu** determines a look for the rays in the effect. The choices are *Default*, *Custom*, *Extended 1*, *Extended 2*, *Extended Bloom*, *Extend and Contract*, *Tight*, *Tight and Extend* and *Tight Bloom*. The *Default* setting gives the best look for each particular filter, so its effect varies from filter to filter. When Custom is chosen, you can use the controls in the Custom Look parameter group to finetune the rays. See "Custom Look Parameter Group" below.

### **Custom Look Parameter Group**

The controls in the Custom Look parameter group allow you to customize and finetune the light rays precisely when the Look menu is set to Custom. If the Look menu is not set to Custom, these controls have no affect. The Default Look simply sets all of the Custom Look controls to their default values for the filter, so switching between Default and Custom has no affect until the Custom Look parameters are adjusted.

**Extend Rays** allows you to extend the rays by favoring light pixels over dark.

**Contract Rays** contracts the rays. While this may seem to be the opposite of Extend Rays, this parameter adjusts the algorithm differently, so increasing Contract Rays is not the same as decreasing Extend Rays.

**Holdout Radius** determines where the rays of light start in relation to the light source. Positive values create a circular region centered around the light source beyond which the rays emanate. Attenuation does not begin until after the radius is reached. Decreasing negative values cause the attenuation to start closer to the light source point.

The **Color menu** determines how the applied light affects the source image. You can also use this menu to preview the source channel used by the filter to create the effect.

- **Colorize** converts the light to colors using the controls in the Colorize Controls Parameter Group.
- **Image** produces a colored lighting effect using color information from the image that the filter is applied to.
- **Light Matte** uses the applied light to modify or create an alpha channel and displays a grayscale matte.
- **Inverse Light Matte** works similarly to Light Matte, but inverts the result.
- **Alpha** uses the applied light to modify or create an alpha channel and uses it to composite the source image.
- **View Source** displays the chosen Light From Channel (the source channel used by the filter to create the effect). This can be especially useful if you are using edges in the image as the Light From Channel.

The **Color Source Layer menu** sets the layer used when the Color menu is set to Image.

The **Color Preset menu** allows you to choose a Colorize preset (a gradient of up to six colors to tone the light rays). If the Mode menu is not set to Colorize, the presets have no effect.

### Colorize Controls Parameter Group

When the **Color menu** is set to **Colorize**, the parameters in this group allow you to use a gradient of up to six colors to tone the light rays. Alternatively, you can conveniently choose a stored gradient without opening the Colorize Controls group by choosing a preset from the Color Preset menu. The **Gradient** displays a preview of the gradient that you create.

All of the parameters in this section can be animated. If the Color menu is not set to Colorize, the parameters in this tab are disabled.

The **Color Space menu** determines whether the gradient is created in **RGB**, **HSL**, or **HSV** color space. Choose HSL or HSV if you want to animate the colors in the gradient while maintaining the level of saturation.

The **Color 1**, **Color 2**, **Color 3**, **Color 4**, **Color 5**, and **Color 6** controls choose six different colors to add to the gradient.

Color 1 and Color 6 are always used. Each of the remaining colors has a **Color On checkbox**. Select this option to add the corresponding color to the gradient. Deselect this option to remove the corresponding color from the gradient.

**Black Point** adjusts the value in the Input Channel which is treated as the pure Color 1 level in the output. All pixels whose Input Channel value is lower than the Black Point value are mapped to the Color 1 color. Increasing positive Black Point values cause more pixels to be purely Color 1 in the output. Decreasing negative values cause fewer pixels to be purely Color 1. The following illustrations show the affect of adjusting the Black Point with a simple two-color gradient from black (Color 1) to white (Color 6).

**White Point** adjusts the value in the Input Channel which is mapped to the pure Color 6 in the output. Increasing White Point causes more pixels to be purely Color 6 in the output.

Negative **Squeeze** values compress and shift the gradient towards the left (Color 1) side. Increasing positive values compress and shift the gradient towards the right (Color 6) side.

The **Loop menu** affects the output when either Loop Count or Gradient Offset are changed from their default values.

- When **Off** is chosen, looping past the end of the gradient uses the end color. This is the default value.
- When you choose **Forward Loop** the gradient loops back to **Color 1** after it passes **Color 6**. You can increase **Loop Count** to set the number of loops or change **Gradient Offset** to move the mapping through this loop.
- When you choose **Back & Forth Loop**, the color mapping goes from 1 to 6 to 6 to 1, etc.

**Loop Count** sets the number of times that the gradient loops. Values less than one use less of the gradient; negative values loop backwards, which only has a different appearance from a positive value if **Gradient Offset** is not zero.

**Gradient Offset** offsets the starting point of the gradient. This can be animated to create palette-shifting effects. A value of 100 offsets the gradient by one full cycle. Since the gradient loops back and forth, setting Gradient Offset to 100 or 300 simply reverses the direction of the gradient.

**Hue** cycles the colors in the gradient around the color wheel in the HSL color space.

**Saturation** adjusts the intensity of each color's hue in the gradient. Negative values desaturate the gradient, while positive values increase the saturation of the gradient.

The **Apply Mode menu** controls how the filter composites the applied light with the image.



For information on the available apply modes, see Appendix A in the User Guide.

### Composite Parameter Group

This parameter group determine how the light is composited over the underlying image. These controls are only active when either Colorize or Use Source Color are chosen as the Light Mode menu.

**Source Threshold** subtracts the threshold from each pixel value when computing the light.

**Light Threshold** sets a value that is subtracted from the light at each pixel before it is applied. If you are animating the position of an object, increasing Light Threshold causes the light to fade out more rapidly as you move away from the source image.

**Source Opacity** adjusts the opacity of the source image in the final composite. Setting source Opacity to 0 has the same effect as setting Apply Mode to None.

**Light Opacity** controls the opacity of the light as it is composited over the source image. This parameter can be overdriven.

Many hosts process media one field at a time which can cause flickering to occur on filtered effects. The **Reduce Flicker menu** allows you to reduce flicker in the rendered image. The only way to evaluate a deflicker setting is to render and play back the effect on an NTSC monitor. Choose from the following options in the Reduce Flicker menu.

- **1-2-1** mixes each pixel with the pixels above and below it, with the input pixel getting twice the weight as the ones above and below. For After Effects users, this works the same as applying the AE Reduce Flicker filter at a setting of 0.5.
- **2-3-2** provides more softening than 1-2-1.
- **1-1-1** provides the most softening for effects that still contain flicker with the above options.
- **Off** is the default. If Off is chosen, no deflickering will be done.

**Mix with Original** blends the source and filtered images. Use this parameter to animate the effect from the unfiltered to the filtered image without adjusting other settings, or to reduce the effect of the filter by mixing it with the source image.

The **Light From menu** determines which source color channel is used to create the light and to calculate the intensities of the source pixels. Pixels with higher values in the selected channel are considered to have higher intensities.

- **Luma, Red, Green, and Blue** use the corresponding color channel and multiply it by the source alpha channel.
- **Luma Inverse** uses the inverted luma channel to make the light.
- **Unmultiplied Luma and Alpha** use the unmodified corresponding source channels.
- **Luma Cartoon Edges** and **Alpha Cartoon Edges** find edges in the corresponding source channel, apply outlines to the edges, and use the resulting image. When Luma Cartoon Edges or Alpha Cartoon Edges is chosen, **Thickness/Intensity** adjusts the width of the outlined edges, and **Cartoon Threshold** sets the value in the threshold above which pixels are considered fully on.
- **Luma Edges** and **Alpha Edges** find edges in the corresponding source channel and use the resulting image. When Luma Edges or Alpha Edges is chosen, **Thickness/Intensity** adjusts the intensity of the edges, and **Edge Floor** adjusts the sensitivity of the filter when searching for edges in the source. Lower values increase sensitivity.
- When **PixelChooser** is chosen, the PixelChooser setting determines how the edges are created.

### Edges Parameter Group

The Edges Parameter group provides additional control if either *Alpha Edges*, *Luma Edges*, *Alpha Cartoon Edge* or *Luma Cartoon Edges* is chosen in the **Light From menu**. If any of the other settings are chosen, the parameters in this section have no affect.

When the **Light From menu** is set to *Alpha Edge* or *Luma Edges*, **Thickness/Intensity** controls the intensity of the edges. When the **Light From menu** is set to *Alpha Cartoon Edge* or *Luma Cartoon Edges*, **Thickness/Intensity** adjusts the thickness of the outside edges.

**Smooth Details** blurs the source image before the filter searches for edges. This blur does not appear in the output; it is used only in edge detection. This parameter only works if the **Light From menu** is set to *Luma Edges*, *Alpha Edges*, *Luma Cartoon Edges* or *Alpha Cartoon Edges*.

**Bloom** blurs the edges before they are used to create the applied light. This parameter only works if the **Light From menu** is set to *Luma Edges*, *Alpha Edges*, *Luma Cartoon Edges* or *Alpha Cartoon Edges*. The following example shows Light from Luma Edges.

**Cartoon Threshold** sets the value in the threshold above which pixels are considered fully on. This parameter is only available if the **Light From menu** is set to *Luma Cartoon Edges* or *Alpha Cartoon Edges*.

### Texture Menu and Texture Controls Parameter Group

These parameters allow you to set and finetune a light texture. The Texture menu and Texture Intensity control appear in a parameter group above the Texture Controls Parameter Group.

Two kinds of texture can be implemented, *Strings* and *Shimmer*.

The **Texture menu** allows you to select any combination of Shimmer and Strings. The options are *Strings*, *Contracted Strings*, *Shimmer*, *Shimmer and Strings*, *Shimmer and Contracted Strings* and *Off*. When *Off* is chosen, no texture is applied. The *Shimmer* controls create a texture that depends on the angle of the line from each point of the image to the light source. The *Strings* controls cause noise to affect the amount of attenuation the light rays experience as the emanate from the source and interact with the pixels they cross.

**Texture Intensity** scales the selected textures. You can create a basic textured look by selecting one of the texture settings and adjusting its intensity. You can then finetune its look by adjusting the parameters in the Texture Controls Group.

**Stringiness** controls the intensity of the texture when the Texture menu is set to one of the Strings options.

**String Softness** controls the softness applied to the string texture.

**String Seed** determines the value input to the random number used by the filter to adjust the strings. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the strings.

**String Morph Rate** controls the rate at which the strings evolve over time. This parameter can be animated, so you can animate from evolving strings to static strings.

**Shimmer Intensity** controls the intensity of the texture when the Texture menu is set to one of the shimmer options.

**Shimmer Detail** adjusts the amount of detail in the shimmer.

**Shimmer Rotate** rotates the shimmer pattern.

**Shimmer Seed** determines the value input to the random number used by the filter to adjust the shimmer. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the shimmer.

**Shimmer Morph Rate** controls the rate at which the Shimmer pattern evolves over time.

**Expand Source %** allows you to expand the rays outside the outside edges of the image.

### **Motion Tracker Parameter Group**

The Motion Tracker parameter group allows you to track the motion of an object, then use the motion data to control another aspect of the effect. In most of the Rays filters, you can apply the motion tracker data to the *Light Source* or to the *PixelChooser*. In the Rays Radiant Spotlight filter, you can also apply the data to the *Light Target*. For example, apply the Rays Radiant Spotlight filter and track a face in a crowd. Use the Light Target parameters to apply the spotlight to highlight the person's face. For more information, see the User Guide.

### **PixelChooser, PC Region and PC Matte Parameter Groups**

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image. For details on the PixelChooser controls, see the User Guide. The Rays filters' PixelChooser includes an additional parameter that appears in the PixelChooser parameter group.

The **PixelChooser Target menu** sets which parameters are affected by the PixelChooser.

- Choosing *Light* scales down the light level at each point in the effect.
- *Mix* makes the PixelChooser behave in the same way that it does in most filters – it mixes the original image with the filtered image.
- *Source Light* scales down the intensity of each pixel as it interacts with the rays crossing it, making the image darker.
- *Attenuation* scales the attenuation at each point where pixels are not fully chosen. This tends to make the rays shorter. You can stop the rays in an unchosen region and pick them up again in the chosen region.
- *Attenuation Boost* creates the reverse of Attenuation; rays travel further in unchosen regions.
- *Off* turns off these options.

## BCC Rays Ripply Filter

The BCC Rays Ripply filter combines a light rays effect with a rippled light effect. The resulting light is generated from a selected channel in the source image and spreads from a source point in all directions.



Source image



Filtered image

The **Ripple menu** allows you to choose the type of the ripple applied to the light.

- *Light Source* causes the dark parts of the ripple to darken the source image and the bright parts to brighten it.
- The *Texture 1* and *Texture 2* choices are much more subtle and affect only the texture of the light.
- *Off* turns off the ripple and only displays light rays.

**Ripple Intensity** scales the amount that the ripple affects the light. A value of 0 is the equivalent of setting the Ripple menu to Off.

**Wave Width** sets the distance between the peaks of the ripple waves. Wave Width does not affect the maximum displacement of each point in the image, but does affect how fast the displacement changes from point to point in the image. Wave Width also affects the number of waves visible in the effect, because as the waves become wider, fewer fit on the screen.



Wave Width=20



Wave Width=40

**Ripple Speed** controls the rate at which the waves move out from the center point. The default speed setting of 1.00 moves the ripple out by one wave width per second. A negative speed value moves the ripples toward the center. When Speed is 0, the ripple is stationary.

### Ripple Controls Parameter Group

The **Waveform menu** setting determines the shape of the wave. The choices fall into two categories: Shape waveforms and Spectrum waveforms.

The Shape waveforms include *Sine*, *Triangle*, *Square*, *Sawtooth*, *Circle*, *Semi-Circle*, *Uncircle*, and *Half-Sine*. These names refer to the shape repeated on a graph that plots the displacement of each point in the wave on the Y axis and the distance of each point from the center on the X axis. The Shape waveforms are mathematically derived and are not intended to look natural.

For a more natural-looking alternative, experiment with the Spectrum waveforms. These are all variations on the sine wave that produce more realistic waves.



For illustrative examples of some of the various waveforms, see the Wave filter.

**Ripple Thickness** controls the shape or thickness of the ripple. Its affect is most easily seen with the Ripple Mode menu set to Light Source.

**Ripple Phase** controls the position of the waves. This parameter works with **Ripple Speed** to control the motion of the ripples as they move from the center. Ripple Speed controls the rate at which the waves move; Ripple Phase controls the position of the waves. In the example below you can see that the center of the ripples can be precisely positioned over the finger.



*Ripple Phase = -35*



*Ripple Phase = 125*



The Ripple Speed and Ripple Phase controls provide several ways to control the movement of your ripple over time.

- Leave **Ripple Phase** at its default setting and adjust **Ripple Speed**. Try this technique if you care about the overall motion but not about the exact number of waves created over the duration of the effect.
- To precisely control the point in the waveform at which the Ripple begins (for example, whether it begins at a peak or a trough), at the first frame of the effect adjust **Ripple Phase** until the wave is at the desired point. To control the number of waves that move out over the duration of the effect, set **Ripple Speed** to 0 and animate **Ripple Phase** to

create movement. For example, suppose you want exactly five waves to form and disperse. At the first keyframe set **Ripple Phase** to **0**. At the last keyframe, set **Ripple Phase** to **1800°** (5 x 360°). Exactly five full waves form over the duration of the effect.

- If you want a static (not animated) distortion, set **Ripple Speed** to **0** and do not animate **Ripple Phase**.

The **Light Source** position point sets the location of the simulated light source on the X and Y axis.

**Intensity** adjusts the intensity of the light source.

**Ray Length** controls the length of the rays of light that emanate from the source. Ray Length also affects controls in the Custom Look group if the Look menu is not set to Custom.

The **Look menu** determines a look for the rays in the effect. The choices are *Default*, *Custom*, *Extended 1*, *Extended 2*, *Extended Bloom*, *Extend and Contract*, *Tight*, *Tight and Extend* and *Tight Bloom*. The *Default* setting gives the best look for each particular filter, so its effect varies from filter to filter. When Custom is chosen, you can use the controls in the Custom Look parameter group to finetune the rays. See “Custom Look Parameter Group” below.

### Custom Look Parameter Group

The controls in the Custom Look parameter group allow you to customize and finetune the light rays precisely when the Look menu is set to Custom. If the Look menu is not set to Custom, these controls have no affect. The Default Look simply sets all of the Custom Look controls to their default values for the filter, so switching between Default and Custom has no affect until the Custom Look parameters are adjusted.

**Extend Rays** allows you to extends the rays by favoring light pixels over dark.

**Contract Rays** contracts the rays. While this may seem to be the opposite of Extend Rays, this parameter adjusts the algorithm differently, so increasing Contract Rays is not the same as decreasing Extend Rays.

**Holdout Radius** determines where the rays of light start in relation to the light source. Positive values create a circular region centered around the light source beyond which the rays emanate. Attenuation does not begin until after the radius is reached. Decreasing negative values cause the attenuation to start closer to the light source point.

The **Color menu** determines how the applied light affects the source image. You can also use this menu to preview the source channel used by the filter to create the effect.

- *Colorize* converts the light to colors using the controls in the Colorize Controls Parameter Group.
- *Image* produces a colored lighting effect using color information from the image that the filter is applied to.
- *Light Matte* uses the applied light to modify or create an alpha channel and displays a grayscale matte.
- *Inverse Light Matte* works similarly to Light Matte, but inverts the result.
- *Alpha* uses the applied light to modify or create an alpha channel and uses it to composite the source image.

- **View Source** displays the chosen Light From Channel (the source channel used by the filter to create the effect). This can be especially useful if you are using edges in the image as the Light From Channel.

The **Color Source Layer menu** sets the layer used when the Color menu is set to Image.

The **Color Preset menu** allows you to choose a Colorize preset (a gradient of up to six colors to tone the light rays). If the Mode menu is not set to Colorize, the presets have no affect.

### Colorize Controls Parameter Group

When the **Color menu** is set to *Colorize*, the parameters in this group allow you to use a gradient of up to six colors to tone the light rays. Alternatively, you can conveniently choose a stored gradient without opening the Colorize Controls group by choosing a preset from the Color Preset menu. The **Gradient** displays a preview of the gradient that you create.

All of the parameters in this section can be animated. If the Color menu is not set to Colorize, the parameters in this tab are disabled.

The **Color Space menu** determines whether the gradient is created in *RGB*, *HSL*, or *HSV* color space. Choose HSL or HSV if you want to animate the colors in the gradient while maintaining the level of saturation.

The **Color 1**, **Color 2**, **Color 3**, **Color 4**, **Color 5**, and **Color 6** controls choose six different colors to add to the gradient.

Color 1 and Color 6 are always used. Each of the remaining colors has a **Color On checkbox**. Select this option to add the corresponding color to the gradient. Deselect this option to remove the corresponding color from the gradient.

**Black Point** adjusts the value in the Input Channel which is treated as the pure Color 1 level in the output. All pixels whose Input Channel value is lower than the Black Point value are mapped to the Color 1 color. Increasing positive Black Point values cause more pixels to be purely Color 1 in the output. Decreasing negative values cause fewer pixels to be purely Color 1. The following illustrations show the affect of adjusting the Black Point with a simple two-color gradient from black (Color 1) to white (Color 6).

**White Point** adjusts the value in the Input Channel which is mapped to the pure Color 6 in the output. Increasing White Point causes more pixels to be purely Color 6 in the output.

Negative **Squeeze** values compress and shift the gradient towards the left (Color 1) side. Increasing positive values compress and shift the gradient towards the right (Color 6) side.

The **Loop menu** affects the output when either Loop Count or Gradient Offset are changed from their default values.

- When **Off** is chosen, looping past the end of the gradient uses the end color. This is the default value.
- When you choose **Forward Loop** the gradient loops back to **Color 1** after it passes **Color 6**. You can increase **Loop Count** to set the number of loops or change **Gradient Offset** to move the mapping through this loop.
- When you choose **Back & Forth Loop**, the color mapping goes from 1 to 6 to 6 to 1, etc.

**Loop Count** sets the number of times that the gradient loops. Values less than one use less of the gradient; negative values loop backwards, which only has a different appearance from a positive value if **Gradient Offset** is not zero.

**Gradient Offset** offsets the starting point of the gradient. This can be animated to create palette-shifting effects. A value of 100 offsets the gradient by one full cycle. Since the gradient loops back and forth, setting Gradient Offset to 100 or 300 simply reverses the direction of the gradient.

**Hue** cycles the colors in the gradient around the color wheel in the HSL color space.

**Saturation** adjusts the intensity of each color's hue in the gradient. Negative values desaturate the gradient, while positive values increase the saturation of the gradient.

The **Apply Mode menu** controls how the filter composites the applied light with the image.



For information on the available apply modes, see Appendix A in the User Guide.

### Composite Parameter Group

This parameter group determine how the light is composited over the underlying image. These controls are only active when either Colorize or Use Source Color are chosen as the Light Mode menu.

**Source Threshold** subtracts the threshold from each pixel value when computing the light.

**Light Threshold** sets a value that is subtracted from the light at each pixel before it is applied. If you are animating the position of an object, increasing Light Threshold causes the light to fade out more rapidly as you move away from the source image.

**Source Opacity** adjusts the opacity of the source image in the final composite. Setting source Opacity to 0 has the same effect as setting Apply Mode to None.

**Light Opacity** controls the opacity of the light as it is composited over the source image. This parameter can be overdriven.

Many hosts process media one field at a time which can cause flickering to occur on filtered effects. The **Reduce Flicker menu** allows you to reduce flicker in the rendered image. The only way to evaluate a deflicker setting is to render and play back the effect on an NTSC monitor. Choose from the following options in the Reduce Flicker menu.

- **1-2-1** mixes each pixel with the pixels above and below it, with the input pixel getting twice the weight as the ones above and below. For After Effects users, this works the same as applying the AE Reduce Flicker filter at a setting of 0.5.
- **2-3-2** provides more softening than 1-2-1.
- **1-1-1** provides the most softening for effects that still contain flicker with the above options.
- **Off** is the default. If Off is chosen, no deflickering will be done.

**Mix with Original** blends the source and filtered images. Use this parameter to animate the effect from the unfiltered to the filtered image without adjusting other settings, or to reduce the effect of the filter by mixing it with the source image.

The **Light From** menu determines which source color channel is used to create the light and to calculate the intensities of the source pixels. Pixels with higher values in the selected channel are considered to have higher intensities.

- *Luma*, *Red*, *Green*, and *Blue* use the corresponding color channel and multiply it by the source alpha channel.
- *Luma Inverse* uses the inverted luma channel to make the light.
- *Unmultiplied Luma* and *Alpha* use the unmodified corresponding source channels.
- *Luma Cartoon Edges* and *Alpha Cartoon Edges* find edges in the corresponding source channel, apply outlines to the edges, and use the resulting image. When *Luma Cartoon Edges* or *Alpha Cartoon Edges* is chosen, **Thickness/Intensity** adjusts the width of the outlined edges, and **Cartoon Threshold** sets the value in the threshold above which pixels are considered fully on.
- *Luma Edges* and *Alpha Edges* find edges in the corresponding source channel and use the resulting image. When *Luma Edges* or *Alpha Edges* is chosen, **Thickness/Intensity** adjusts the intensity of the edges, and **Edge Floor** adjusts the sensitivity of the filter when searching for edges in the source. Lower values increase sensitivity.
- When *PixelChooser* is chosen, the *PixelChooser* setting determines how the edges are created.

### Edges Parameter Group

The Edges Parameter group provides additional control if either *Alpha Edges*, *Luma Edges*, *Alpha Cartoon Edge* or *Luma Cartoon Edges* is chosen in the **Light From** menu. If any of the other settings are chosen, the parameters in this section have no affect.

When the **Light From** menu is set to *Alpha Edge* or *Luma Edges*, **Thickness/Intensity** controls the intensity of the edges. When the **Light From** menu is set to *Alpha Cartoon Edge* or *Luma Cartoon Edges*, **Thickness/Intensity** adjusts the thickness of the outside edges.

**Smooth Details** blurs the source image before the filter searches for edges. This blur does not appear in the output; it is used only in edge detection. This parameter only works if the **Light From** menu is set to *Luma Edges*, *Alpha Edges*, *Luma Cartoon Edges* or *Alpha Cartoon Edges*.

**Bloom** blurs the edges before they are used to create the applied light. This parameter only works if the **Light From** menu is set to *Luma Edges*, *Alpha Edges*, *Luma Cartoon Edges* or *Alpha Cartoon Edges*. The following example shows Light from Luma Edges.

**Cartoon Threshold** sets the value in the threshold above which pixels are considered fully on. This parameter is only available if the **Light From** menu is set to *Luma Cartoon Edges* or *Alpha Cartoon Edges*.

### Texture Menu and Texture Controls Parameter Group

These parameters allow you to set and finetune a light texture. The Texture menu and Texture Intensity control appear in a parameter group above the Texture Controls Parameter Group.

Two kinds of texture can be implemented, *Strings* and *Shimmer*.

The **Texture menu** allows you to select any combination of Shimmer and Strings. The options are *Strings*, *Contracted Strings*, *Shimmer*, *Shimmer and Strings*, *Shimmer and Contracted Strings* and *Off*. When *Off* is chosen, no texture is applied. The *Shimmer* controls create a texture that depends on the angle of the line from each point of the image to the light source. The *Strings* controls cause noise to affect the amount of attenuation the light rays experience as the emanate from the source and interact with the pixels they cross.

**Texture Intensity** scales the selected textures. You can create a basic textured look by selecting one of the texture settings and adjusting its intensity. You can then finetune its look by adjusting the parameters in the Texture Controls Group.

**Stringiness** controls the intensity of the texture when the Texture menu is set to one of the Strings options.

**String Softness** controls the softness applied to the string texture.

**String Seed** determines the value input to the random number used by the filter to adjust the strings. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the strings.

**String Morph Rate** controls the rate at which the strings evolve over time. This parameter can be animated, so you can animate from evolving strings to static strings.

**Shimmer Intensity** controls the intensity of the texture when the Texture menu is set to one of the shimmer options.

**Shimmer Detail** adjusts the amount of detail in the shimmer.

**Shimmer Rotate** rotates the shimmer pattern.

**Shimmer Seed** determines the value input to the random number used by the filter to adjust the shimmer. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the shimmer.

**Shimmer Morph Rate** controls the rate at which the Shimmer pattern evolves over time.

**Expand Source %** allows you to expand the rays outside the outside edges of the image.

### **Motion Tracker Parameter Group**

The Motion Tracker parameter group allows you to track the motion of an object, then use the motion data to control another aspect of the effect. In most of the Rays filters, you can apply the motion tracker data to the *Light Source* or to the *PixelChooser*. In the Rays Radiant Spotlight filter, you can also apply the data to the *Light Target*. For example, apply the Rays Radiant Spotlight filter and track a face in a crowd. Use the Light Target parameters to apply the spotlight to highlight the person's face. For more information, see the User Guide.

### **PixelChooser, PC Region and PC Matte Parameter Groups**

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image. For details on the PixelChooser controls, see the User Guide. The Rays filters' PixelChooser includes an additional parameter that appears in the PixelChooser parameter group.

The **PixelChooser Target menu** sets which parameters are affected by the PixelChooser.

- Choosing *Light* scales down the light level at each point in the effect.
- *Mix* makes the PixelChooser behave in the same way that it does in most filters – it mixes the original image with the filtered image.
- *Source Light* scales down the intensity of each pixel as it interacts with the rays crossing it, making the image darker.
- *Attenuation* scales the attenuation at each point where pixels are not fully chosen. This tends to make the rays shorter. You can stop the rays in an unchosen region and pick them up again in the chosen region.
- *Attenuation Boost* creates the reverse of Attenuation; rays travel further in unchosen regions.
- *Off* turns off these options.

## BCC Rays Streaky Filter

The BCC Rays Streaky filter produces a light that contains streaks. The resulting light is generated from a chosen channel in the source image, and spreads from a source point in all directions.



Source image



Filtered image

The **Light Source** position points set the location of the simulated light source on the X and Y axis.

**Intensity** adjusts the intensity of the light source.

**Ray Length** controls the length of the rays of light that emanate from the source. Ray Length also affects controls in the Custom Look group if the Look menu is not set to Custom.

The **Ray Style menu** determines what type of rays are created. The choices are *Detailed* and *Fat*. Detailed produces rays that retain a great deal of detail as they spread from the Light Source. Fat produces less distinct rays. Fat Style produces rays similar to those produced by the Light Zoom filter.

The **Look menu** determines a look for the rays in the effect. The choices are *Default*, *Custom*, *Extended 1*, *Extended 2*, *Extended Bloom*, *Extend and Contract*, *Tight*, *Tight and Extend* and *Tight Bloom*. The *Default* setting gives the best look for each particular filter, so its effect varies from filter to filter. When Custom is chosen, you can use the controls in the Custom Look parameter group to finetune the rays. See “Custom Look Parameter Group” below.

### Custom Look Parameter Group

The controls in the Custom Look parameter group allow you to customize and finetune the light rays precisely when the Look menu is set to Custom. If the Look menu is not set to Custom, these controls have no affect. The Default Look simply sets all of the Custom Look controls to their default values for the filter, so switching between Default and Custom has no affect until the Custom Look parameters are adjusted.

**Extend Rays** allows you to extends the rays by favoring light pixels over dark.

**Contract Rays** contracts the rays. While this may seem to be the opposite of Extend Rays, this parameter adjusts the algorithm differently, so increasing Contract Rays is not the same as decreasing Extend Rays.

**Holdout Radius** determines where the rays of light start in relation to the light source. Positive values create a circular region centered around the light source beyond which the rays emanate. Attenuation does not begin until after the radius is reached. Decreasing negative values cause the attenuation to start closer to the light source point.

The **Color menu** determines how the applied light affects the source image. You can also use this menu to preview the source channel used by the filter to create the effect.

- **Colorize** converts the light to colors using the controls in the Colorize Controls Parameter Group.
- **Image** produces a colored lighting effect using color information from the image that the filter is applied to.
- **Light Matte** uses the applied light to modify or create an alpha channel and displays a grayscale matte.
- **Inverse Light Matte** works similarly to Light Matte, but inverts the result.
- **Alpha** uses the applied light to modify or create an alpha channel and uses it to composite the source image.
- **View Source** displays the chosen Light From Channel (the source channel used by the filter to create the effect). This can be especially useful if you are using edges in the image as the Light From Channel.

The **Color Source Layer menu** sets the layer used when the Color menu is set to Image.

### Working with the Color Preset Menu

The **Color Preset menu** allows you to choose a Colorize preset (a gradient of up to six colors to tone the light rays). If the Mode menu is not set to Colorize, the presets have no affect.

### Colorize Controls Parameter Group

When the **Color menu** is set to **Colorize**, the parameters in this group allow you to use a gradient of up to six colors to tone the light rays. Alternatively, you can conveniently choose a stored gradient without opening the Colorize Controls group by choosing a preset from the Color Preset menu. The **Gradient** displays a preview of the gradient that you create.

All of the parameters in this section can be animated. If the Color menu is not set to Colorize, the parameters in this tab are disabled.

The **Color Space menu** determines whether the gradient is created in **RGB**, **HSL**, or **HSV** color space. Choose HSL or HSV if you want to animate the colors in the gradient while maintaining the level of saturation.

The **Color 1**, **Color 2**, **Color 3**, **Color 4**, **Color 5**, and **Color 6** controls choose six different colors to add to the gradient.

Color 1 and Color 6 are always used. Each of the remaining colors has a **Color On checkbox**. Select this option to add the corresponding color to the gradient. Deselect this option to remove the corresponding color from the gradient.

**Black Point** adjusts the value in the Input Channel which is treated as the pure Color 1 level in the output. All pixels whose Input Channel value is lower than the Black Point value are mapped to the Color 1 color. Increasing positive Black Point values cause more pixels to be purely Color 1 in the output. Decreasing negative values cause fewer pixels to be purely Color 1. The following illustrations show the affect of adjusting the Black Point with a simple two-color gradient from black (Color 1) to white (Color 6).

**White Point** adjusts the value in the Input Channel which is mapped to the pure Color 6 in the output. Increasing White Point causes more pixels to be purely Color 6 in the output.

Negative **Squeeze** values compress and shift the gradient towards the left (Color 1) side. Increasing positive values compress and shift the gradient towards the right (Color 6) side.

The **Loop menu** affects the output when either Loop Count or Gradient Offset are changed from their default values.

- When **Off** is chosen, looping past the end of the gradient uses the end color. This is the default value.
- When you choose **Forward Loop** the gradient loops back to **Color 1** after it passes **Color 6**. You can increase **Loop Count** to set the number of loops or change **Gradient Offset** to move the mapping through this loop.
- When you choose **Back & Forth Loop**, the color mapping goes from 1 to 6 to 6 to 1, etc.

**Loop Count** sets the number of times that the gradient loops. Values less than one use less of the gradient; negative values loop backwards, which only has a different appearance from a positive value if **Gradient Offset** is not zero.

**Gradient Offset** offsets the starting point of the gradient. This can be animated to create palette-shifting effects. A value of 100 offsets the gradient by one full cycle. Since the gradient loops back and forth, setting Gradient Offset to 100 or 300 simply reverses the direction of the gradient.

**Hue** cycles the colors in the gradient around the color wheel in the HSL color space.

**Saturation** adjusts the intensity of each color's hue in the gradient. Negative values desaturate the gradient, while positive values increase the saturation of the gradient.

The **Apply Mode menu** controls how the filter composites the applied light with the image.



For information on the available apply modes, see Appendix A in the User Guide.

### Composite Parameter Group

This parameter group determine how the light is composited over the underlying image. These controls are only active when either Colorize or Use Source Color are chosen as the Light Mode menu.

**Source Threshold** subtracts the threshold from each pixel value when computing the light.

**Light Threshold** sets a value that is subtracted from the light at each pixel before it is applied. If you are animating the position of an object, increasing Light Threshold causes the light to fade out more rapidly as you move away from the source image.

**Source Opacity** adjusts the opacity of the source image in the final composite. Setting source Opacity to 0 has the same effect as setting Apply Mode to None.

**Light Opacity** controls the opacity of the light as it is composited over the source image. This parameter can be overdriven.

Many hosts process media one field at a time which can cause flickering to occur on filtered effects. The **Reduce Flicker menu** allows you to reduce flicker in the rendered image. The only way to evaluate a deflicker setting is to render and play back the effect on an NTSC monitor. Choose from the following options in the Reduce Flicker menu.

- **1-2-1** mixes each pixel with the pixels above and below it, with the input pixel getting twice the weight as the ones above and below. For After Effects users, this works the same as applying the AE Reduce Flicker filter at a setting of 0.5.
- **2-3-2** provides more softening than 1-2-1.
- **1-1-1** provides the most softening for effects that still contain flicker with the above options.
- **Off** is the default. If Off is chosen, no deflickering will be done.

**Mix with Original** blends the source and filtered images. Use this parameter to animate the effect from the unfiltered to the filtered image without adjusting other settings, or to reduce the effect of the filter by mixing it with the source image.

The **Light From menu** determines which source color channel is used to create the light and to calculate the intensities of the source pixels. Pixels with higher values in the selected channel are considered to have higher intensities.

- **Luma, Red, Green, and Blue** use the corresponding color channel and multiply it by the source alpha channel.
- **Luma Inverse** uses the inverted luma channel to make the light.
- **Unmultiplied Luma and Alpha** use the unmodified corresponding source channels.
- **Luma Cartoon Edges** and **Alpha Cartoon Edges** find edges in the corresponding source channel, apply outlines to the edges, and use the resulting image. When Luma Cartoon Edges or Alpha Cartoon Edges is chosen, **Thickness/Intensity** adjusts the width of the outlined edges, and **Cartoon Threshold** sets the value in the threshold above which pixels are considered fully on.
- **Luma Edges** and **Alpha Edges** find edges in the corresponding source channel and use the resulting image. When Luma Edges or Alpha Edges is chosen, **Thickness/Intensity** adjusts the intensity of the edges, and **Edge Floor** adjusts the sensitivity of the filter when searching for edges in the source. Lower values increase sensitivity.
- When **PixelChooser** is chosen, the PixelChooser setting determines how the edges are created.

### Edges Parameter Group

The Edges Parameter group provides additional control if either *Alpha Edges*, *Luma Edges*, *Alpha Cartoon Edge* or *Luma Cartoon Edges* is chosen in the **Light From menu**. If any of the other settings are chosen, the parameters in this section have no affect.

When the **Light From menu** is set to *Alpha Edge* or *Luma Edges*, **Thickness/Intensity** controls the intensity of the edges. When the **Light From menu** is set to *Alpha Cartoon Edge* or *Luma Cartoon Edges*, **Thickness/Intensity** adjusts the thickness of the outside edges.

**Smooth Details** blurs the source image before the filter searches for edges. This blur does not appear in the output; it is used only in edge detection. This parameter only works if the **Light From menu** is set to *Luma Edges*, *Alpha Edges*, *Luma Cartoon Edges* or *Alpha Cartoon Edges*.

**Bloom** blurs the edges before they are used to create the applied light. This parameter only works if the **Light From menu** is set to *Luma Edges*, *Alpha Edges*, *Luma Cartoon Edges* or *Alpha Cartoon Edges*. The following example shows Light from Luma Edges.

**Cartoon Threshold** sets the value in the threshold above which pixels are considered fully on. This parameter is only available if the **Light From menu** is set to *Luma Cartoon Edges* or *Alpha Cartoon Edges*.

### Texture Menu and Texture Controls Parameter Group

These parameters allow you to set and finetune a light texture. The Texture menu and Texture Intensity control appear in a parameter group above the Texture Controls Parameter Group.

Two kinds of texture can be implemented, *Strings* and *Shimmer*.

The **Texture menu** allows you to select any combination of Shimmer and Strings. The options are *Strings*, *Contracted Strings*, *Shimmer*, *Shimmer and Strings*, *Shimmer and Contracted Strings* and *Off*. When *Off* is chosen, no texture is applied. The *Shimmer* controls create a texture that depends on the angle of the line from each point of the image to the light source. The *Strings* controls cause noise to affect the amount of attenuation the light rays experience as the emanate from the source and interact with the pixels they cross.

**Texture Intensity** scales the selected textures. You can create a basic textured look by selecting one of the texture settings and adjusting its intensity. You can then finetune its look by adjusting the parameters in the Texture Controls Group.

**Stringiness** controls the intensity of the texture when the Texture menu is set to one of the Strings options.

**String Softness** controls the softness applied to the string texture.

**String Seed** determines the value input to the random number used by the filter to adjust the strings. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the strings.

**String Morph Rate** controls the rate at which the strings evolve over time. This parameter can be animated, so you can animate from evolving strings to static strings.

**Shimmer Intensity** controls the intensity of the texture when the Texture menu is set to one of the shimmer options.

**Shimmer Detail** adjusts the amount of detail in the shimmer.

**Shimmer Rotate** rotates the shimmer pattern.

**Shimmer Seed** determines the value input to the random number used by the filter to adjust the shimmer. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the shimmer.

**Shimmer Morph Rate** controls the rate at which the Shimmer pattern evolves over time.

**Expand Source %** allows you to expand the rays outside the outside edges of the image.

### Motion Tracker Parameter Group

The Motion Tracker parameter group allows you to track the motion of an object, then use the motion data to control another aspect of the effect. In most of the Rays filters, you can apply the motion tracker data to the *Light Source* or to the *PixelChooser*. In the Rays Radiant Spotlight filter, you can also apply the data to the *Light Target*. For example, apply the Rays Radiant Spotlight filter and track a face in a crowd. Use the Light Target parameters to apply the spotlight to highlight the person's face. For more information, see Chapter One in the User Guide.

### PixelChooser, PC Region and PC Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image. For details on the PixelChooser controls, see the User Guide. The Rays filters' PixelChooser includes an additional parameter that appears in the PixelChooser parameter group.

The **PixelChooser Target menu** sets which parameters are affected by the PixelChooser.

- Choosing *Light* scales down the light level at each point in the effect.
- *Mix* makes the PixelChooser behave in the same way that it does in most filters – it mixes the original image with the filtered image.
- *Source Light* scales down the intensity of each pixel as it interacts with the rays crossing it, making the image darker.
- *Attenuation* scales the attenuation at each point where pixels are not fully chosen. This tends to make the rays shorter. You can stop the rays in an unchosen region and pick them up again in the chosen region.
- *Attenuation Boost* creates the reverse of Attenuation; rays travel further in unchosen regions.
- *Off* turns off these options.

## BCC Rays Textured Filter

The BCC Rays Textured filter creates a textured light using a noise map pattern. The resulting light is generated from a chosen channel in the source image, and spreads from a source point in all directions.



Source image



Filtered image

The **Texture menu** allows you to choose the type of the texture applied to the light.

- **On** displays the clip with the applied textured light. You create the texture using the Noise Map Texture parameters.
- **View** displays the noise map used to create the texture. This is helpful for finetuning the texture.
- **Off** turns off the texture and only displays a light.

**Texture Amount** sets the amount of texture and **Texture Scale** sets the scale of the texture. The easiest way to adjust these parameters is to set the Texture menu to View. When you finish adjusting the texture, set the Texture menu to On.

### Noise Map Texture Parameter Group

**Texture Bias** subtly changes the effect of the texture by reducing the values as they are applied to the light.

**Texture Flow Rate** sets the speed of motion of the noise patten. The entire noise pattern moves unchanged in the flow direction.

**Texture Flow Direction** sets the direction of motion of the noise pattern.

**Texture Morph Start** controls the look of the texture at the first frame of the effect. You can set this parameter then adjust the Texture Morph Rate to animate the texture.

**Texture Morph Rate** determines the rate at which the noise pattern surges and changes the pattern of the noise map globally over time.

The **Texture Radius** and **Texture Falloff** controls let you limit the texture to a region around the light source. Setting the Texture Radius to 0 is the equivalent of setting the Texture Mode menu to Texture Off.



The **Texture Downsample** menu allows you to speed rendering by creating a smaller (downsampled) noise map. The options are *Off*, *2*, *4*, and *8*. Increasing this setting can make the look of the filter rougher, which is useful for some effects.

The **Light Source** position points set the location of the simulated light source on the X and Y axis.

**Intensity** adjusts the intensity of the light source.

**Ray Length** controls the length of the rays of light that emanate from the source. Ray Length also affects controls in the Custom Look group if the Look menu is not set to Custom.

The **Ray Style** menu determines what type of rays are created. The choices are *Detailed* and *Fat*. Detailed produces rays that retain a great deal of detail as they spread from the Light Source. Fat produces less distinct rays. Fat Style produces rays similar to those produced by the Light Zoom filter.

The **Look** menu determines a look for the rays in the effect. The choices are *Default*, *Custom*, *Extended 1*, *Extended 2*, *Extended Bloom*, *Extend and Contract*, *Tight*, *Tight and Extend* and *Tight Bloom*. The *Default* setting gives the best look for each particular filter, so its effect varies from filter to filter. When Custom is chosen, you can use the controls in the Custom Look parameter group to finetune the rays. See “Custom Look Parameter Group” below.

### Custom Look Parameter Group

The controls in the Custom Look parameter group allow you to customize and finetune the light rays precisely when the Look menu is set to Custom. If the Look menu is not set to Custom, these controls have no affect. The Default Look simply sets all of the Custom Look controls to their default values for the filter, so switching between Default and Custom has no affect until the Custom Look parameters are adjusted.

**Extend Rays** allows you to extends the rays by favoring light pixels over dark.

**Contract Rays** contracts the rays. While this may seem to be the opposite of Extend Rays, this parameter adjusts the algorithm differently, so increasing Contract Rays is not the same as decreasing Extend Rays.

**Holdout Radius** determines where the rays of light start in relation to the light source. Positive values create a circular region centered around the light source beyond which the rays emanate. Attenuation does not begin until after the radius is reached. Decreasing negative values cause the attenuation to start closer to the light source point.

The **Color menu** determines how the applied light affects the source image. You can also use this menu to preview the source channel used by the filter to create the effect.

- **Colorize** converts the light to colors using the controls in the Colorize Controls Parameter Group.
- **Image** produces a colored lighting effect using color information from the image that the filter is applied to.
- **Light Matte** uses the applied light to modify or create an alpha channel and displays a grayscale matte.
- **Inverse Light Matte** works similarly to Light Matte, but inverts the result.
- **Alpha** uses the applied light to modify or create an alpha channel and uses it to composite the source image.
- **View Source** displays the chosen Light From Channel (the source channel used by the filter to create the effect). This can be especially useful if you are using edges in the image as the Light From Channel.

The **Color Source Layer menu** sets the layer used when the Color menu is set to Image.

### Working with the Color Preset Menu

The **Color Preset menu** allows you to choose a Colorize preset (a gradient of up to six colors to tone the light rays). If the Mode menu is not set to Colorize, the presets have no affect.

### Colorize Controls Parameter Group

When the **Color menu** is set to **Colorize**, the parameters in this group allow you to use a gradient of up to six colors to tone the light rays. Alternatively, you can conveniently choose a stored gradient without opening the Colorize Controls group by choosing a preset from the Color Preset menu. The **Gradient** displays a preview of the gradient that you create.

All of the parameters in this section can be animated. If the Color menu is not set to Colorize, the parameters in this tab are disabled.

The **Color Space menu** determines whether the gradient is created in **RGB**, **HSL**, or **HSV** color space. Choose HSL or HSV if you want to animate the colors in the gradient while maintaining the level of saturation.

The **Color 1**, **Color 2**, **Color 3**, **Color 4**, **Color 5**, and **Color 6** controls choose six different colors to add to the gradient.

Color 1 and Color 6 are always used. Each of the remaining colors has a **Color On checkbox**. Select this option to add the corresponding color to the gradient. Deselect this option to remove the corresponding color from the gradient.

**Black Point** adjusts the value in the Input Channel which is treated as the pure Color 1 level in the output. All pixels whose Input Channel value is lower than the Black Point value are mapped to the Color 1 color. Increasing positive Black Point values cause more pixels to be purely Color 1 in the output. Decreasing negative values cause fewer pixels to be purely Color 1. The following illustrations show the affect of adjusting the Black Point with a simple two-color gradient from black (Color 1) to white (Color 6).

**White Point** adjusts the value in the Input Channel which is mapped to the pure Color 6 in the output. Increasing White Point causes more pixels to be purely Color 6 in the output.

Negative **Squeeze** values compress and shift the gradient towards the left (Color 1) side. Increasing positive values compress and shift the gradient towards the right (Color 6) side.

The **Loop menu** affects the output when either Loop Count or Gradient Offset are changed from their default values.

- When **Off** is chosen, looping past the end of the gradient uses the end color. This is the default value.
- When you choose **Forward Loop** the gradient loops back to **Color 1** after it passes **Color 6**. You can increase **Loop Count** to set the number of loops or change **Gradient Offset** to move the mapping through this loop.
- When you choose **Back & Forth Loop**, the color mapping goes from 1 to 6 to 6 to 1, etc.

**Loop Count** sets the number of times that the gradient loops. Values less than one use less of the gradient; negative values loop backwards, which only has a different appearance from a positive value if **Gradient Offset** is not zero.

**Gradient Offset** offsets the starting point of the gradient. This can be animated to create palette-shifting effects. A value of 100 offsets the gradient by one full cycle. Since the gradient loops back and forth, setting Gradient Offset to 100 or 300 simply reverses the direction of the gradient.

**Hue** cycles the colors in the gradient around the color wheel in the HSL color space.

**Saturation** adjusts the intensity of each color's hue in the gradient. Negative values desaturate the gradient, while positive values increase the saturation of the gradient.

The **Apply Mode menu** controls how the filter composites the applied light with the image.



For information on the available apply modes, see Appendix A in the User Guide.

### Composite Parameter Group

This parameter group determine how the light is composited over the underlying image. These controls are only active when either Colorize or Use Source Color are chosen as the Light Mode menu.

**Source Threshold** subtracts the threshold from each pixel value when computing the light.

**Light Threshold** sets a value that is subtracted from the light at each pixel before it is applied. If you are animating the position of an object, increasing Light Threshold causes the light to fade out more rapidly as you move away from the source image.

**Source Opacity** adjusts the opacity of the source image in the final composite. Setting source Opacity to 0 has the same effect as setting Apply Mode to None.

**Light Opacity** controls the opacity of the light as it is composited over the source image. This parameter can be overdriven.

Many hosts process media one field at a time which can cause flickering to occur on filtered effects. The **Reduce Flicker menu** allows you to reduce flicker in the rendered image. The only way to evaluate a deflicker setting is to render and play back the effect on an NTSC monitor. Choose from the following options in the Reduce Flicker menu.

- **1-2-1** mixes each pixel with the pixels above and below it, with the input pixel getting twice the weight as the ones above and below. For After Effects users, this works the same as applying the AE Reduce Flicker filter at a setting of 0.5.
- **2-3-2** provides more softening than 1-2-1.
- **1-1-1** provides the most softening for effects that still contain flicker with the above options.
- **Off** is the default. If Off is chosen, no deflickering will be done.

**Mix with Original** blends the source and filtered images. Use this parameter to animate the effect from the unfiltered to the filtered image without adjusting other settings, or to reduce the effect of the filter by mixing it with the source image.

### Working with the Light From Menu

The **Light From menu** determines which source color channel is used to create the light and to calculate the intensities of the source pixels. Pixels with higher values in the selected channel are considered to have higher intensities.

- **Luma, Red, Green, and Blue** use the corresponding color channel and multiply it by the source alpha channel.
- **Luma Inverse** uses the inverted luma channel to make the light.
- **Unmultiplied Luma and Alpha** use the unmodified corresponding source channels.
- **Luma Cartoon Edges** and **Alpha Cartoon Edges** find edges in the corresponding source channel, apply outlines to the edges, and use the resulting image. When Luma Cartoon Edges or Alpha Cartoon Edges is chosen, **Thickness/Intensity** adjusts the width of the outlined edges, and **Cartoon Threshold** sets the value in the threshold above which pixels are considered fully on.
- **Luma Edges** and **Alpha Edges** find edges in the corresponding source channel and use the resulting image. When Luma Edges or Alpha Edges is chosen, **Thickness/Intensity** adjusts the intensity of the edges, and **Edge Floor** adjusts the sensitivity of the filter when searching for edges in the source. Lower values increase sensitivity.
- When **PixelChooser** is chosen, the PixelChooser setting determines how the edges are created.

### Edges Parameter Group

The Edges Parameter group provides additional control if either *Alpha Edges*, *Luma Edges*, *Alpha Cartoon Edge* or *Luma Cartoon Edges* is chosen in the **Light From menu**. If any of the other settings are chosen, the parameters in this section have no affect.

When the **Light From menu** is set to *Alpha Edge* or *Luma Edges*, **Thickness/Intensity** controls the intensity of the edges. When the **Light From menu** is set to *Alpha Cartoon Edge* or *Luma Cartoon Edges*, **Thickness/Intensity** adjusts the thickness of the outside edges.

**Smooth Details** blurs the source image before the filter searches for edges. This blur does not appear in the output; it is used only in edge detection. This parameter only works if the **Light From menu** is set to *Luma Edges*, *Alpha Edges*, *Luma Cartoon Edges* or *Alpha Cartoon Edges*.

**Bloom** blurs the edges before they are used to create the applied light. This parameter only works if the **Light From menu** is set to *Luma Edges*, *Alpha Edges*, *Luma Cartoon Edges* or *Alpha Cartoon Edges*. The following example shows Light from Luma Edges.

**Cartoon Threshold** sets the value in the threshold above which pixels are considered fully on. This parameter is only available if the **Light From menu** is set to *Luma Cartoon Edges* or *Alpha Cartoon Edges*.

### Texture Menu and Texture Controls Parameter Group

These parameters allow you to set and finetune a light texture. The Texture menu and Texture Intensity control appear in a parameter group above the Texture Controls Parameter Group.

Two kinds of texture can be implemented, *Strings* and *Shimmer*.

The **Texture menu** allows you to select any combination of Shimmer and Strings. The options are *Strings*, *Contracted Strings*, *Shimmer*, *Shimmer and Strings*, *Shimmer and Contracted Strings* and *Off*. When *Off* is chosen, no texture is applied. The *Shimmer* controls create a texture that depends on the angle of the line from each point of the image to the light source. The *Strings* controls cause noise to affect the amount of attenuation the light rays experience as the emanate from the source and interact with the pixels they cross.

**Texture Intensity** scales the selected textures. You can create a basic textured look by selecting one of the texture settings and adjusting its intensity. You can then finetune its look by adjusting the parameters in the Texture Controls Group.

**Stringiness** controls the intensity of the texture when the Texture menu is set to one of the Strings options.

**String Softness** controls the softness applied to the string texture.

**String Seed** determines the value input to the random number used by the filter to adjust the strings. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the strings.

**String Morph Rate** controls the rate at which the strings evolve over time. This parameter can be animated, so you can animate from evolving strings to static strings.

**Shimmer Intensity** controls the intensity of the texture when the Texture menu is set to one of the shimmer options.

**Shimmer Detail** adjusts the amount of detail in the shimmer.

**Shimmer Rotate** rotates the shimmer pattern.

**Shimmer Seed** determines the value input to the random number used by the filter to adjust the shimmer. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the shimmer.

**Shimmer Morph Rate** controls the rate at which the Shimmer pattern evolves over time.

**Expand Source %** allows you to expand the rays outside the outside edges of the image.

### Motion Tracker Parameter Group

The Motion Tracker parameter group allows you to track the motion of an object, then use the motion data to control another aspect of the effect. In most of the Rays filters, you can apply the motion tracker data to the *Light Source* or to the *PixelChooser*. In the Rays Radiant Spotlight filter, you can also apply the data to the *Light Target*. For example, apply the Rays Radiant Spotlight filter and track a face in a crowd. Use the Light Target parameters to apply the spotlight to highlight the person's face. For more information, see Chapter One in the User Guide.

### PixelChooser, PC Region and PC Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image. For details on the PixelChooser controls, see the User Guide. The Rays filters' PixelChooser includes an additional parameter that appears in the PixelChooser parameter group.

The **PixelChooser Target menu** sets which parameters are affected by the PixelChooser.

- Choosing *Light* scales down the light level at each point in the effect.
- *Mix* makes the PixelChooser behave in the same way that it does in most filters – it mixes the original image with the filtered image.
- *Source Light* scales down the intensity of each pixel as it interacts with the rays crossing it, making the image darker.
- *Attenuation* scales the attenuation at each point where pixels are not fully chosen. This tends to make the rays shorter. You can stop the rays in an unchosen region and pick them up again in the chosen region.
- *Attenuation Boost* creates the reverse of Attenuation; rays travel further in unchosen regions.
- *Off* turns off these options.

## BCC Rays Wedge Filter

The BCC Rays Wedge filter is a light rays filter that mattes the light source with a wedge-shaped light. The resulting light is generated from a selected channel in the source image, and spreads from a source point in all directions.



Source image



Filtered image

The **Wedge menu** is a preview control.

- *On* displays the clip with the applied wedge light.
- *View* displays a black and white matte of the wedge in which fully selected pixels are black and fully unselected pixels are white. This is useful for adjusting the light.
- *Off* turns off the matte and only displays the light rays.

The **Type menu** allows you to choose the type of wedge that is created.

- *Centered* creates a wedge that is centered around an angle. If Centered is chosen, Wedge Center sets the center of the wedge.
- *From To* creates a wedge that goes from the **Wedge From** to the **Wedge To** angle. This is similar to a clock wipe.



Wedge Type=Centered



Wedge Type=From To

**Wedge Center/Wedge From** determines either the center of the wedge (when *Centered* is chosen in the Wedge Type menu), or the start of the wedge angle (when *From To* is chosen in the Wedge Type menu).

When *From To* is chosen in the Type menu, the **Wedge To** determines the end of the wedge angle. When *Centered* is chosen in the Type menu, **From To** has no affect.

**Wedge Thickness** adjusts the thickness of the wedge when *Centered* is chosen in the Type menu. When *From To* is chosen in the Type menu, Thickness has no affect.

**Wedge Softness** softens the edges of the wedge.



Wedge Softness=0



Wedge Softness=25

The **Light Source** position points set the location of the simulated light source on the X and Y axis.

**Intensity** adjusts the intensity of the light source.

**Ray Length** controls the length of the rays of light that emanate from the source. Ray Length also affects controls in the Custom Look group if the Look menu is not set to Custom.

The **Ray Style menu** determines what type of rays are created. The choices are *Detailed* and *Fat*. Detailed produces rays that retain a great deal of detail as they spread from the Light Source. Fat produces less distinct rays. Fat Style produces rays similar to those produced by the Light Zoom filter.

The **Look menu** determines a look for the rays in the effect. The choices are *Default*, *Custom*, *Extended 1*, *Extended 2*, *Extended Bloom*, *Extend and Contract*, *Tight*, *Tight and Extend* and *Tight Bloom*. The *Default* setting gives the best look for each particular filter, so its effect varies from filter to filter. When Custom is chosen, you can use the controls in the Custom Look parameter group to finetune the rays. See "Custom Look Parameter Group" below.

### Custom Look Parameter Group

The controls in the Custom Look parameter group allow you to customize and finetune the light rays precisely when the Look menu is set to Custom. If the Look menu is not set to Custom, these controls have no affect. The Default Look simply sets all of the Custom Look controls to their default values for the filter, so switching between Default and Custom has no affect until the Custom Look parameters are adjusted.

**Extend Rays** allows you to extends the rays by favoring light pixels over dark.

**Contract Rays** contracts the rays. While this may seem to be the opposite of Extend Rays, this parameter adjusts the algorithm differently, so increasing Contract Rays is not the same as decreasing Extend Rays.

**Holdout Radius** determines where the rays of light start in relation to the light source. Positive values create a circular region centered around the light source beyond which the rays emanate. Attenuation does not begin until after the radius is reached. Decreasing negative values cause the attenuation to start closer to the light source point.

The **Color menu** determines how the applied light affects the source image. You can also use this menu to preview the source channel used by the filter to create the effect.

- **Colorize** converts the light to colors using the controls in the Colorize Controls Parameter Group.
- **Image** produces a colored lighting effect using color information from the image that the filter is applied to.
- **Light Matte** uses the applied light to modify or create an alpha channel and displays a grayscale matte.
- **Inverse Light Matte** works similarly to Light Matte, but inverts the result.
- **Alpha** uses the applied light to modify or create an alpha channel and uses it to composite the source image.
- **View Source** displays the chosen Light From Channel (the source channel used by the filter to create the effect). This can be especially useful if you are using edges in the image as the Light From Channel.

The **Color Source Layer menu** sets the layer used when the Color menu is set to Image.

### Working with the Color Preset Menu

The **Color Preset menu** allows you to choose a Colorize preset (a gradient of up to six colors to tone the light rays). If the Mode menu is not set to Colorize, the presets have no affect.

### Colorize Controls Parameter Group

When the **Color menu** is set to **Colorize**, the parameters in this group allow you to use a gradient of up to six colors to tone the light rays. Alternatively, you can conveniently choose a stored gradient without opening the Colorize Controls group by choosing a preset from the Color Preset menu. The **Gradient** displays a preview of the gradient that you create.

All of the parameters in this section can be animated. If the Color menu is not set to Colorize, the parameters in this tab are disabled.

The **Color Space menu** determines whether the gradient is created in **RGB**, **HSL**, or **HSV** color space. Choose HSL or HSV if you want to animate the colors in the gradient while maintaining the level of saturation.

The **Color 1**, **Color 2**, **Color 3**, **Color 4**, **Color 5**, and **Color 6** controls choose six different colors to add to the gradient.

Color 1 and Color 6 are always used. Each of the remaining colors has a **Color On checkbox**. Select this option to add the corresponding color to the gradient. Deselect this option to remove the corresponding color from the gradient.

**Black Point** adjusts the value in the Input Channel which is treated as the pure Color 1 level in the output. All pixels whose Input Channel value is lower than the Black Point value are mapped to the Color 1 color. Increasing positive Black Point values cause more pixels to be purely Color 1 in the output. Decreasing negative values cause fewer pixels to be purely Color 1. The following illustrations show the affect of adjusting the Black Point with a simple two-color gradient from black (Color 1) to white (Color 6).

**White Point** adjusts the value in the Input Channel which is mapped to the pure Color 6 in the output. Increasing White Point causes more pixels to be purely Color 6 in the output.

Negative **Squeeze** values compress and shift the gradient towards the left (Color 1) side. Increasing positive values compress and shift the gradient towards the right (Color 6) side.

The **Loop menu** affects the output when either Loop Count or Gradient Offset are changed from their default values.

- When **Off** is chosen, looping past the end of the gradient uses the end color. This is the default value.
- When you choose **Forward Loop** the gradient loops back to **Color 1** after it passes **Color 6**. You can increase **Loop Count** to set the number of loops or change **Gradient Offset** to move the mapping through this loop.
- When you choose **Back & Forth Loop**, the color mapping goes from 1 to 6 to 6 to 1, etc.

**Loop Count** sets the number of times that the gradient loops. Values less than one use less of the gradient; negative values loop backwards, which only has a different appearance from a positive value if **Gradient Offset** is not zero.

**Gradient Offset** offsets the starting point of the gradient. This can be animated to create palette-shifting effects. A value of 100 offsets the gradient by one full cycle. Since the gradient loops back and forth, setting Gradient Offset to 100 or 300 simply reverses the direction of the gradient.

**Hue** cycles the colors in the gradient around the color wheel in the HSL color space.

**Saturation** adjusts the intensity of each color's hue in the gradient. Negative values desaturate the gradient, while positive values increase the saturation of the gradient.

The **Apply Mode menu** controls how the filter composites the applied light with the image.



For information on the available apply modes, see Appendix A in the User Guide.

### Composite Parameter Group

This parameter group determine how the light is composited over the underlying image. These controls are only active when either Colorize or Use Source Color are chosen as the Light Mode menu.

**Source Threshold** subtracts the threshold from each pixel value when computing the light.

**Light Threshold** sets a value that is subtracted from the light at each pixel before it is applied. If you are animating the position of an object, increasing Light Threshold causes the light to fade out more rapidly as you move away from the source image.

**Source Opacity** adjusts the opacity of the source image in the final composite. Setting source Opacity to 0 has the same effect as setting Apply Mode to None.

**Light Opacity** controls the opacity of the light as it is composited over the source image. This parameter can be overdriven.

Many hosts process media one field at a time which can cause flickering to occur on filtered effects. The **Reduce Flicker menu** allows you to reduce flicker in the rendered image. The only way to evaluate a deflicker setting is to render and play back the effect on an NTSC monitor. Choose from the following options in the Reduce Flicker menu.

- **1-2-1** mixes each pixel with the pixels above and below it, with the input pixel getting twice the weight as the ones above and below. For After Effects users, this works the same as applying the AE Reduce Flicker filter at a setting of 0.5.
- **2-3-2** provides more softening than 1-2-1.
- **1-1-1** provides the most softening for effects that still contain flicker with the above options.
- **Off** is the default. If Off is chosen, no deflickering will be done.

**Mix with Original** blends the source and filtered images. Use this parameter to animate the effect from the unfiltered to the filtered image without adjusting other settings, or to reduce the effect of the filter by mixing it with the source image.

### Working with the Light From Menu

The **Light From menu** determines which source color channel is used to create the light and to calculate the intensities of the source pixels. Pixels with higher values in the selected channel are considered to have higher intensities.

- **Luma, Red, Green, and Blue** use the corresponding color channel and multiply it by the source alpha channel.
- **Luma Inverse** uses the inverted luma channel to make the light.
- **Unmultiplied Luma and Alpha** use the unmodified corresponding source channels.
- **Luma Cartoon Edges** and **Alpha Cartoon Edges** find edges in the corresponding source channel, apply outlines to the edges, and use the resulting image. When Luma Cartoon Edges or Alpha Cartoon Edges is chosen, **Thickness/Intensity** adjusts the width of the outlined edges, and **Cartoon Threshold** sets the value in the threshold above which pixels are considered fully on.
- **Luma Edges** and **Alpha Edges** find edges in the corresponding source channel and use the resulting image. When Luma Edges or Alpha Edges is chosen, **Thickness/Intensity** adjusts the intensity of the edges, and **Edge Floor** adjusts the sensitivity of the filter when searching for edges in the source. Lower values increase sensitivity.
- When **PixelChooser** is chosen, the PixelChooser setting determines how the edges are created.

### Edges Parameter Group

The Edges Parameter group provides additional control if either *Alpha Edges*, *Luma Edges*, *Alpha Cartoon Edge* or *Luma Cartoon Edges* is chosen in the **Light From menu**. If any of the other settings are chosen, the parameters in this section have no affect.

When the **Light From menu** is set to *Alpha Edge* or *Luma Edges*, **Thickness/Intensity** controls the intensity of the edges. When the **Light From menu** is set to *Alpha Cartoon Edge* or *Luma Cartoon Edges*, **Thickness/Intensity** adjusts the thickness of the outside edges.

**Smooth Details** blurs the source image before the filter searches for edges. This blur does not appear in the output; it is used only in edge detection. This parameter only works if the **Light From menu** is set to *Luma Edges*, *Alpha Edges*, *Luma Cartoon Edges* or *Alpha Cartoon Edges*.

**Bloom** blurs the edges before they are used to create the applied light. This parameter only works if the **Light From menu** is set to *Luma Edges*, *Alpha Edges*, *Luma Cartoon Edges* or *Alpha Cartoon Edges*. The following example shows Light from Luma Edges.

**Cartoon Threshold** sets the value in the threshold above which pixels are considered fully on. This parameter is only available if the **Light From menu** is set to *Luma Cartoon Edges* or *Alpha Cartoon Edges*.

### Texture Menu and Texture Controls Parameter Group

These parameters allow you to set and finetune a light texture. The Texture menu and Texture Intensity control appear in a parameter group above the Texture Controls Parameter Group.

Two kinds of texture can be implemented, *Strings* and *Shimmer*.

The **Texture menu** allows you to select any combination of Shimmer and Strings. The options are *Strings*, *Contracted Strings*, *Shimmer*, *Shimmer and Strings*, *Shimmer and Contracted Strings* and *Off*. When *Off* is chosen, no texture is applied. The *Shimmer* controls create a texture that depends on the angle of the line from each point of the image to the light source. The *Strings* controls cause noise to affect the amount of attenuation the light rays experience as the emanate from the source and interact with the pixels they cross.

**Texture Intensity** scales the selected textures. You can create a basic textured look by selecting one of the texture settings and adjusting its intensity. You can then finetune its look by adjusting the parameters in the Texture Controls Group.

**Stringiness** controls the intensity of the texture when the Texture menu is set to one of the Strings options.

**String Softness** controls the softness applied to the string texture.

**String Seed** determines the value input to the random number used by the filter to adjust the strings. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the strings.

**String Morph Rate** controls the rate at which the strings evolve over time. This parameter can be animated, so you can animate from evolving strings to static strings.

**Shimmer Intensity** controls the intensity of the texture when the Texture menu is set to one of the shimmer options.

**Shimmer Detail** adjusts the amount of detail in the shimmer.

**Shimmer Rotate** rotates the shimmer pattern.

**Shimmer Seed** determines the value input to the random number used by the filter to adjust the shimmer. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the shimmer.

**Shimmer Morph Rate** controls the rate at which the Shimmer pattern evolves over time.

**Expand Source %** allows you to expand the rays outside the outside edges of the image.

### Motion Tracker Parameter Group

The Motion Tracker parameter group allows you to track the motion of an object, then use the motion data to control another aspect of the effect. In most of the Rays filters, you can apply the motion tracker data to the *Light Source* or to the *PixelChooser*. In the Rays Radiant Spotlight filter, you can also apply the data to the *Light Target*. For example, apply the Rays Radiant Spotlight filter and track a face in a crowd. Use the Light Target parameters to apply the spotlight to highlight the person's face. For more information, see Chapter One in the User Guide.

### PixelChooser, PC Region and PC Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image. For details on the PixelChooser controls, see the User Guide. The Rays filters' PixelChooser includes an additional parameter that appears in the PixelChooser parameter group.

The **PixelChooser Target menu** sets which parameters are affected by the PixelChooser.

- Choosing *Light* scales down the light level at each point in the effect.
- *Mix* makes the PixelChooser behave in the same way that it does in most filters – it mixes the original image with the filtered image.
- *Source Light* scales down the intensity of each pixel as it interacts with the rays crossing it, making the image darker.
- *Attenuation* scales the attenuation at each point where pixels are not fully chosen. This tends to make the rays shorter. You can stop the rays in an unchosen region and pick them up again in the chosen region.
- *Attenuation Boost* creates the reverse of Attenuation; rays travel further in unchosen regions.
- *Off* turns off these options.

## BCC Rays Puffy Filter

The BCC Rays Puffy filter light which spreads from a source point creating a soft, “puffy” appearance. The light is generated from a chosen channel in the source image.



*Source image*



*Filtered image*

The **Light Source X** and **Y** position points set the location of the simulated light source on the X and Y axis.

**Intensity** adjusts the intensity of the light source.

**Ray Length** controls the length of the rays of light that emanate from the source. Ray Length also affects controls in the Custom Look group if the Look menu is not set to Custom.

The **Ray Style** menu determines what type of rays are created. The choices are *Detailed* and *Fat*. Detailed produces rays that retain a great deal of detail as they spread from the Light Source. Fat produces less distinct rays. Fat Style produces rays similar to those produced by the Light Zoom filter.



*Detailed*



*Fat*

The **Look menu** determines a look for the rays in the effect. The choices are *Default*, *Custom*, *Extended 1*, *Extended 2*, *Extended Bloom*, *Extend and Contract*, *Tight*, *Tight and Extend* and *Tight Bloom*. The *Default* setting gives the best look for each particular filter, so its effect varies from filter to filter. When *Custom* is chosen, you can use the controls in the Custom Look parameter group to finetune the rays. See “Custom Look Parameter Group” below.



*Default*



*Extended Bloom*



*Tight*



*Tight Bloom*

### **Custom Look Parameter Group**

The controls in the Custom Look parameter group allow you to customize and finetune the light rays precisely when the Look menu is set to Custom. If the Look menu is not set to Custom, these controls have no affect. The Default Look simply sets all of the Custom Look controls to their default values for the filter, so switching between Default and Custom has no affect until the Custom Look parameters are adjusted.

**Extend Rays** allows you to extends the rays by favoring light pixels over dark.

**Contract Rays** contracts the rays. While this may seem to be the opposite of Extend Rays, this parameter adjusts the algorithm differently, so increasing Contract Rays is not the same as decreasing Extend Rays.

**Holdout Radius** determines where the rays of light start in relation to the light source. Positive values create a circular region centered around the light source beyond which the rays emanate. Attenuation does not begin until after the radius is reached. Decreasing negative values cause the attenuation to start closer to the light source point.



*Holdout Radius=0*



*Holdout Radius=50*

The **Color** menu determines how the applied light affects the source image. You can also use this menu to preview the source channel used by the filter to create the effect.

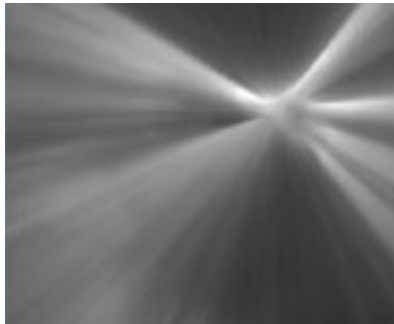
- **Colorize** converts the light to colors using the controls in the Colorize Controls Parameter Group.
- **Image** produces a colored lighting effect using color information from the image that the filter is applied to.
- **Light Matte** uses the applied light to modify or create an alpha channel and displays a grayscale matte.
- **Inverse Light Matte** works similarly to Light Matte, but inverts the result.
- **Alpha** uses the applied light to modify or create an alpha channel and uses it to composite the source image.
- **View Source** displays the chosen Light From Channel (the source channel used by the filter to create the effect). This can be especially useful if you are using edges in the image as the Light From Channel.



*Colorize*



*Image*



*Light Matte*



*View Source (Light From=Luma)*

The **Color Source Layer menu** sets the layer used when the Color menu is set to Image.

The **Color Preset menu** allows you to choose a Colorize preset (a gradient of up to six colors to tone the light rays). If the Mode menu is not set to Colorize, the presets have no affect.

#### **Colorize Controls Parameter Group**

When the **Color menu** is set to *Colorize*, the parameters in this group allow you to use a gradient of up to six colors to tone the light rays. Alternatively, you can conveniently choose a stored gradient without opening the Colorize Controls group by choosing a preset from the Color Preset menu. The **Gradient** displays a preview of the gradient that you create.

All of the parameters in this section can be animated. If the Color menu is not set to Colorize, the parameters in this tab are disabled.

The **Color Space menu** determines whether the gradient is created in *RGB*, *HSL*, or *HSV* color space. Choose HSL or HSV is you want to animate the colors in the gradient while maintaining the level of saturation.

The **Color 1**, **Color 2**, **Color 3**, **Color 4**, **Color 5**, and **Color 6** controls choose six different colors to add to the gradient.

Color 1 and Color 6 are always used. Each of the remaining colors has a **Color On checkbox**. Select this option to add the corresponding color to the gradient. Deselect this option to remove the corresponding color from the gradient.

**Black Point** adjusts the value in the Input Channel which is treated as the pure Color 1 level in the output. All pixels whose Input Channel value is lower than the Black Point value are mapped to the Color 1 color. Increasing positive Black Point values cause more pixels to be

purely Color 1 in the output. Decreasing negative values cause fewer pixels to be purely Color 1. The following illustrations show the affect of adjusting the Black Point with a simple two-color gradient from black (Color 1) to white (Color 6).



**White Point** adjusts the value in the Input Channel which is mapped to the pure Color 6 in the output. Increasing White Point causes more pixels to be purely Color 6 in the output.

Negative **Squeeze** values compress and shift the gradient towards the left (Color 1) side. Increasing positive values compress and shift the gradient towards the right (Color 6) side.



The **Loop** menu affects the output when either Loop Count or Gradient Offset are changed from their default values.

- When **Off** is chosen, looping past the end of the gradient uses the end color. This is the default value.
- When you choose **Forward Loop** the gradient loops back to **Color 1** after it passes **Color 6**. You can increase **Loop Count** to set the number of loops or change **Gradient Offset** to move the mapping through this loop.
- When you choose **Back & Forth Loop**, the color mapping goes from 1 to 6 to 6 to 1, etc.

**Loop Count** sets the number of times that the gradient loops. Values less than one use less of the gradient; negative values loop backwards, which only has a different appearance from a positive value if **Gradient Offset** is not zero.

**Gradient Offset** offsets the starting point of the gradient. This can be animated to create palette-shifting effects. A value of 100 offsets the gradient by one full cycle. Since the gradient loops back and forth, setting Gradient Offset to 100 or 300 simply reverses the direction of the gradient.

**Hue** cycles the colors in the gradient around the color wheel in the HSL color space.

**Saturation** adjusts the intensity of each color's hue in the gradient. Negative values desaturate the gradient, while positive values increase the saturation of the gradient.

The **Apply Mode menu** controls how the filter composites the applied light with the image.



For information on the available apply modes, see Appendix A in the User Guide.

### Composite Parameter Group

This parameter group determine how the light is composited over the underlying image. These controls are only active when either Colorize or Use Source Color are chosen as the Light Mode menu.

**Source Threshold** subtracts the threshold from each pixel value when computing the light.

**Light Threshold** sets a value that is subtracted from the light at each pixel before it is applied. If you are animating the position of an object, increasing Light Threshold causes the light to fade out more rapidly as you move away from the source image.

**Source Opacity** adjusts the opacity of the source image in the final composite. Setting source Opacity to 0 has the same effect as setting Apply Mode to None.

**Light Opacity** controls the opacity of the light as it is composited over the source image. This parameter can be overdriven.

Many hosts process media one field at a time which can cause flickering to occur on filtered effects. The **Reduce Flicker menu** allows you to reduce flicker in the rendered image. The only way to evaluate a deflicker setting is to render and play back the effect on an NTSC monitor. Choose from the following options in the Reduce Flicker menu.

- **1-2-1** mixes each pixel with the pixels above and below it, with the input pixel getting twice the weight as the ones above and below. For After Effects users, this works the same as applying the AE Reduce Flicker filter at a setting of 0.5.
- **2-3-2** provides more softening than 1-2-1.
- **1-1-1** provides the most softening for effects that still contain flicker with the above options.
- **Off** is the default. If Off is chosen, no deflickering will be done.

**Mix with Original** blends the source and filtered images. Use this parameter to animate the effect from the unfiltered to the filtered image without adjusting other settings, or to reduce the effect of the filter by mixing it with the source image.

The **Light From menu** determines which source color channel is used to create the light and to calculate the intensities of the source pixels. Pixels with higher values in the selected channel are considered to have higher intensities.

- **Luma, Red, Green, and Blue** use the corresponding color channel and multiply it by the source alpha channel.
- **Luma Inverse** uses the inverted luma channel to make the light.

- *Unmultiplied Luma* and *Alpha* use the unmodified corresponding source channels.
- *Luma Cartoon Edges* and *Alpha Cartoon Edges* find edges in the corresponding source channel, apply outlines to the edges, and use the resulting image. When *Luma Cartoon Edges* or *Alpha Cartoon Edges* is chosen, **Thickness/Intensity** adjusts the width of the outlined edges, and **Cartoon Threshold** sets the value in the threshold above which pixels are considered fully on.
- *Luma Edges* and *Alpha Edges* find edges in the corresponding source channel and use the resulting image. When *Luma Edges* or *Alpha Edges* is chosen, **Thickness/Intensity** adjusts the intensity of the edges, and **Edge Floor** adjusts the sensitivity of the filter when searching for edges in the source. Lower values increase sensitivity.
- When *PixelChooser* is chosen, the *PixelChooser* setting determines how the edges are created.

### Edges Parameter Group

The Edges Parameter group provides additional control if either *Alpha Edges*, *Luma Edges*, *Alpha Cartoon Edge* or *Luma Cartoon Edges* is chosen in the **Light From** menu. If any of the other settings are chosen, the parameters in this section have no affect.

When the **Light From** menu is set to *Alpha Edge* or *Luma Edges*, **Thickness/Intensity** controls the intensity of the edges. When the **Light From** menu is set to *Alpha Cartoon Edge* or *Luma Cartoon Edges*, **Thickness/Intensity** adjusts the thickness of the outside edges.

**Smooth Details** blurs the source image before the filter searches for edges. This blur does not appear in the output; it is used only in edge detection. This parameter only works if the **Light From** menu is set to *Luma Edges*, *Alpha Edges*, *Luma Cartoon Edges* or *Alpha Cartoon Edges*.

**Bloom** blurs the edges before they are used to create the applied light. This parameter only works if the **Light From** menu is set to *Luma Edges*, *Alpha Edges*, *Luma Cartoon Edges* or *Alpha Cartoon Edges*. The following example shows Light from *Luma Edges*.



**Cartoon Threshold** sets the value in the threshold above which pixels are considered fully on. This parameter is only available if the **Light From** menu is set to *Luma Cartoon Edges* or *Alpha Cartoon Edges*.

### Texture Menu and Texture Controls Parameter Group

These parameters allow you to set and finetune a light texture. The Texture menu and Texture Intensity control appear in a parameter group above the Texture Controls Parameter Group.

Two kinds of texture can be implemented, *Strings* and *Shimmer*.

The **Texture menu** allows you to select any combination of Shimmer and Strings. The options are *Strings*, *Contracted Strings*, *Shimmer*, *Shimmer and Strings*, *Shimmer and Contracted Strings* and *Off*. When *Off* is chosen, no texture is applied. The *Shimmer* controls create a texture that depends on the angle of the line from each point of the image to the light source. The *Strings* controls cause noise to affect the amount of attenuation the light rays experience as the emanate from the source and interact with the pixels they cross.



**Texture Intensity** scales the selected textures. You can create a basic textured look by selecting one of the texture settings and adjusting its intensity. You can then finetune its look by adjusting the parameters in the Texture Controls Group.

**Stringiness** controls the intensity of the texture when the Texture menu is set to one of the Strings options.

**String Softness** controls the softness applied to the string texture.

**String Seed** determines the value input to the random number used by the filter to adjust the strings. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the strings.

**String Morph Rate** controls the rate at which the strings evolve over time. This parameter can be animated, so you can animate from evolving strings to static strings.

**Shimmer Intensity** controls the intensity of the texture when the Texture menu is set to one of the shimmer options.

**Shimmer Detail** adjusts the amount of detail in the shimmer.

**Shimmer Rotate** rotates the shimmer pattern.

**Shimmer Seed** determines the value input to the random number used by the filter to adjust the shimmer. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the shimmer.

**Shimmer Morph Rate** controls the rate at which the Shimmer pattern evolves over time.

**Expand Source %** allows you to expand the rays outside the outside edges of the image.

### **Motion Tracker Parameter Group**

The Motion Tracker parameter group allows you to track the motion of an object, then use the motion data to control another aspect of the effect. In most of the Rays filters, you can apply the motion tracker data to the *Light Source* or to the *PixelChooser*. In the Rays Radiant Spotlight filter, you can also apply the data to the *Light Target*. For example, apply the Rays Radiant Spotlight filter and track a face in a crowd. Use the Light Target parameters to apply the spotlight to highlight the person's face. For more information, see Chapter One in the User Guide.

### **PixelChooser, PC Region and PC Matte Parameter Groups**

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image. For details on the PixelChooser controls, see the User Guide. The Rays filters' PixelChooser includes an additional parameter that appears in the PixelChooser parameter group.

The **PixelChooser Target menu** sets which parameters are affected by the PixelChooser.

- Choosing *Light* scales down the light level at each point in the effect.
- *Mix* makes the PixelChooser behave in the same way that it does in most filters – it mixes the original image with the filtered image.
- *Source Light* scales down the intensity of each pixel as it interacts with the rays crossing it, making the image darker.
- *Attenuation* scales the attenuation at each point where pixels are not fully chosen. This tends to make the rays shorter. You can stop the rays in an unchosen region and pick them up again in the chosen region.
- *Attenuation Boost* creates the reverse of Attenuation; rays travel further in unchosen regions.
- *Off* turns off these options.

## BCC Rays Radiant Edges Filter

The BCC Rays Radiant Edges filter creates light from the edges of the image. This filter includes similar controls to the BCC Rays Cartoon filter.



Source image



Filtered image

The **Edges From** menu determines which source channel is used to create the edges and to calculate the intensities of the source pixels. Pixels with higher values in the chosen channel are considered to have higher intensities.

- *Luma, Red, Green* and *Blue* use the corresponding color channel and multiply it by the source alpha channel.
- *Alpha* uses the unmodified corresponding source channels.
- *PixelChooser* uses the region defined in the PixelChooser (see below).

**Edge Intensity** adjusts the intensity of the edges before the filter searches for edges.

**Smooth Details** blurs the source image before the filter searches for edges. This blur does not appear in the output; it is used only in edge detection.

**Bloom** blurs the edges before they are used to create the applied light.

**Reduce Grit** reduces noise in the image by ignoring edges that are lower than the Edge Intensity.

The **Light over Edges** checkbox composites the light over the edges, when the Apply Mode is set to something other than *None*. If the Apply Mode menu is set to *None*, enabling this checkbox will treat the Apply Mode menu as if it set to *In Front*.

**Edge Color** sets the color of the edges.

The **Light Source** position point sets the location of the simulated light source on the X and Y axis.

**Intensity** adjusts the intensity of the light source.

**Ray Length** controls the length of the rays of light that emanate from the source. Ray Length also affects controls in the Custom Look group if the Look menu is not set to Custom.

The **Ray Style menu** determines what type of rays are created. The choices are *Detailed* and *Fat*. Detailed produces rays that retain a great deal of detail as they spread from the Light Source. Fat produces less distinct rays. Fat Style produces rays similar to those produced by the Light Zoom filter.

The **Look menu** determines a look for the rays in the effect. The choices are *Default*, *Custom*, *Extended 1*, *Extended 2*, *Extended Bloom*, *Extend and Contract*, *Tight*, *Tight and Extend* and *Tight Bloom*. The *Default* setting gives the best look for each particular filter, so its effect varies from filter to filter. When Custom is chosen, you can use the controls in the Custom Look parameter group to finetune the rays. See “Custom Look Parameter Group” below.

### **Custom Look Parameter Group**

The controls in the Custom Look parameter group allow you to customize and finetune the light rays precisely when the Look menu is set to Custom. If the Look menu is not set to Custom, these controls have no affect. The Default Look simply sets all of the Custom Look controls to their default values for the filter, so switching between Default and Custom has no affect until the Custom Look parameters are adjusted.

**Extend Rays** allows you to extends the rays by favoring light pixels over dark.

**Contract Rays** contracts the rays. While this may seem to be the opposite of Extend Rays, this parameter adjusts the algorithm differently, so increasing Contract Rays is not the same as decreasing Extend Rays.

**Holdout Radius** determines where the rays of light start in relation to the light source. Positive values create a circular region centered around the light source beyond which the rays emanate. Attenuation does not begin until after the radius is reached. Decreasing negative values cause the attenuation to start closer to the light source point.

The **Color menu** determines how the applied light affects the source image. You can also use this menu to preview the source channel used by the filter to create the effect.

- *Colorize* converts the light to colors using the controls in the Colorize Controls Parameter Group.
- *Image* produces a colored lighting effect using color information from the image that the filter is applied to.
- *Light Matte* uses the applied light to modify or create an alpha channel and displays a grayscale matte.
- *Inverse Light Matte* works similarly to Light Matte, but inverts the result.
- *Alpha* uses the applied light to modify or create an alpha channel and uses it to composite the source image.
- *View Source* displays the chosen Light From Channel (the source channel used by the filter to create the effect). This can be especially useful if you are using edges in the image as the Light From Channel.

The **Color Source Layer menu** sets the layer used when the Color menu is set to Image.

## Working with the Color Preset Menu

The **Color Preset menu** allows you to choose a Colorize preset (a gradient of up to six colors to tone the light rays). If the Mode menu is not set to Colorize, the presets have no affect.

## Colorize Controls Parameter Group

When the **Color menu** is set to *Colorize*, the parameters in this group allow you to use a gradient of up to six colors to tone the light rays. Alternatively, you can conveniently choose a stored gradient without opening the Colorize Controls group by choosing a preset from the Color Preset menu. The **Gradient** displays a preview of the gradient that you create.

All of the parameters in this section can be animated. If the Color menu is not set to Colorize, the parameters in this tab are disabled.

The **Color Space menu** determines whether the gradient is created in *RGB*, *HSL*, or *HSV* color space. Choose HSL or HSV if you want to animate the colors in the gradient while maintaining the level of saturation.

The **Color 1**, **Color 2**, **Color 3**, **Color 4**, **Color 5**, and **Color 6** controls choose six different colors to add to the gradient.

Color 1 and Color 6 are always used. Each of the remaining colors has a **Color On checkbox**. Select this option to add the corresponding color to the gradient. Deselect this option to remove the corresponding color from the gradient.

**Black Point** adjusts the value in the Input Channel which is treated as the pure Color 1 level in the output. All pixels whose Input Channel value is lower than the Black Point value are mapped to the Color 1 color. Increasing positive Black Point values cause more pixels to be purely Color 1 in the output. Decreasing negative values cause fewer pixels to be purely Color 1. The following illustrations show the affect of adjusting the Black Point with a simple two-color gradient from black (Color 1) to white (Color 6).

**White Point** adjusts the value in the Input Channel which is mapped to the pure Color 6 in the output. Increasing White Point causes more pixels to be purely Color 6 in the output.

Negative **Squeeze** values compress and shift the gradient towards the left (Color 1) side. Increasing positive values compress and shift the gradient towards the right (Color 6) side.

The **Loop menu** affects the output when either Loop Count or Gradient Offset are changed from their default values.

- When **Off** is chosen, looping past the end of the gradient uses the end color. This is the default value.
- When you choose **Forward Loop** the gradient loops back to **Color 1** after it passes **Color 6**. You can increase **Loop Count** to set the number of loops or change **Gradient Offset** to move the mapping through this loop.
- When you choose **Back & Forth Loop**, the color mapping goes from 1 to 6 to 6 to 1, etc.

**Loop Count** sets the number of times that the gradient loops. Values less than one use less of the gradient; negative values loop backwards, which only has a different appearance from a positive value if **Gradient Offset** is not zero.

**Gradient Offset** offsets the starting point of the gradient. This can be animated to create palette-shifting effects. A value of 100 offsets the gradient by one full cycle. Since the gradient loops back and forth, setting Gradient Offset to 100 or 300 simply reverses the direction of the gradient.

**Hue** cycles the colors in the gradient around the color wheel in the HSL color space.

**Saturation** adjusts the intensity of each color's hue in the gradient. Negative values desaturate the gradient, while positive values increase the saturation of the gradient.

The **Apply Mode menu** controls how the filter composites the applied light with the image.



For information on the available apply modes, see Appendix A in the User Guide.

### Composite Parameter Group

This parameter group determine how the light is composited over the underlying image. These controls are only active when either Colorize or Use Source Color are chosen as the Light Mode menu.

**Source Threshold** subtracts the threshold from each pixel value when computing the light.

**Light Threshold** sets a value that is subtracted from the light at each pixel before it is applied. If you are animating the position of an object, increasing Light Threshold causes the light to fade out more rapidly as you move away from the source image.

**Source Opacity** adjusts the opacity of the source image in the final composite. Setting source Opacity to 0 has the same effect as setting Apply Mode to None.

**Light Opacity** controls the opacity of the light as it is composited over the source image. This parameter can be overdriven.

Many hosts process media one field at a time which can cause flickering to occur on filtered effects. The **Reduce Flicker menu** allows you to reduce flicker in the rendered image. The only way to evaluate a deflicker setting is to render and play back the effect on an NTSC monitor. Choose from the following options in the Reduce Flicker menu.

- **1-2-1** mixes each pixel with the pixels above and below it, with the input pixel getting twice the weight as the ones above and below. For After Effects users, this works the same as applying the AE Reduce Flicker filter at a setting of 0.5.
- **2-3-2** provides more softening than 1-2-1.
- **1-1-1** provides the most softening for effects that still contain flicker with the above options.
- **Off** is the default. If Off is chosen, no deflickering will be done.

**Mix with Original** blends the source and filtered images. Use this parameter to animate the effect from the unfiltered to the filtered image without adjusting other settings, or to reduce the effect of the filter by mixing it with the source image.

### Texture Menu and Texture Controls Parameter Group

These parameters allow you to set and finetune a light texture. The Texture menu and Texture Intensity control appear in a parameter group above the Texture Controls Parameter Group.

Two kinds of texture can be implemented, *Strings* and *Shimmer*.

The **Texture menu** allows you to select any combination of Shimmer and Strings. The options are *Strings*, *Contracted Strings*, *Shimmer*, *Shimmer and Strings*, *Shimmer and Contracted Strings* and *Off*. When *Off* is chosen, no texture is applied. The *Shimmer* controls create a texture that depends on the angle of the line from each point of the image to the light source. The *Strings* controls cause noise to affect the amount of attenuation the light rays experience as the emanate from the source and interact with the pixels they cross.

**Texture Intensity** scales the selected textures. You can create a basic textured look by selecting one of the texture settings and adjusting its intensity. You can then finetune its look by adjusting the parameters in the Texture Controls Group.

**Stringiness** controls the intensity of the texture when the Texture menu is set to one of the Strings options.

**String Softness** controls the softness applied to the string texture.

**String Seed** determines the value input to the random number used by the filter to adjust the strings. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the strings.

**String Morph Rate** controls the rate at which the strings evolve over time. This parameter can be animated, so you can animate from evolving strings to static strings.

**Shimmer Intensity** controls the intensity of the texture when the Texture menu is set to one of the shimmer options.

**Shimmer Detail** adjusts the amount of detail in the shimmer.

**Shimmer Rotate** rotates the shimmer pattern.

**Shimmer Seed** determines the value input to the random number used by the filter to adjust the shimmer. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the shimmer.

**Shimmer Morph Rate** controls the rate at which the Shimmer pattern evolves over time.

**Expand Source %** allows you to expand the rays outside the outside edges of the image.

### Motion Tracker Parameter Group

The Motion Tracker parameter group allows you to track the motion of an object, then use the motion data to control another aspect of the effect. In most of the Rays filters, you can apply the motion tracker data to the *Light Source* or to the *Pixel Chooser*. In the Rays Radiant Spotlight filter, you can also apply the data to the *Light Target*. For example, apply the Rays Radiant Spotlight filter and track a face in a crowd. Use the Light Target parameters to apply the spotlight to highlight the person's face. For more information, see Chapter One in the User Guide.

### PixelChooser, PC Region and PC Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image. For details on the PixelChooser controls, see the User Guide. The Rays filters' PixelChooser includes an additional parameter that appears in the PixelChooser parameter group.

The **PixelChooser Target menu** sets which parameters are affected by the PixelChooser.

- Choosing *Light* scales down the light level at each point in the effect.
- *Mix* makes the PixelChooser behave in the same way that it does in most filters – it mixes the original image with the filtered image.
- *Source Light* scales down the intensity of each pixel as it interacts with the rays crossing it, making the image darker.
- *Attenuation* scales the attenuation at each point where pixels are not fully chosen. This tends to make the rays shorter. You can stop the rays in an unchosen region and pick them up again in the chosen region.
- *Attenuation Boost* creates the reverse of Attenuation; rays travel further in unchosen regions.
- *Off* turns off these options.